UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

1LSS, INC.,
Patent Owner.

IPR2025-01180
Patent No. 11,864,641

R. GLENN AKHAVEIN, P.E. IN SUPPORT OF PATENT OWNER'S RESPONSE

TABLE OF CONTENTS

Page

I. Introduction and Qualifications 1
A. Technical Qualifications 2
B. Materials Reviewed 7
C. Compensation 8
D. Legal Standards Applied 8
E. Definition of PHOSITA 14
II. Summary of Opinions 15
A. Berkley/Baca Grounds 15
B. Zhu/Kinshi Grounds 16
III. Overview of the Technology 18
A. The '641 Patent 18
a. The Specification 18
b. The Claims 22
c. The Prosecution History 25
i. Claims 1, 3-5, 7, and 11 - The Berkley-Levy |Rejection 26
ii. Claims 1, 3-5, 7-9, and 11 - The Berkley-Baca Rejection 29
iii. What the Board Did Not Address 33
iv. Claims 2 and 6 - The Ferromagnetic Shield and Metallic Plate 34
v. Claim 12 — Different Orientation or Different Geometric Pattern 37
B. How Magnetic Stripes Work and How They Are Damaged 42

C. How Ferromagnetic Shielding Works — And Its Prerequisites 56
D. Mechanical Alignment Systems 64
a. Overview 64
b. Levy's Mechanical Alignment System — The Protrusion and Recess 65
c. Levy's Magnets Provide Attachment Force Only — Mechanical Features Control Orientation 67
d. Levy Achieves Specific Orientation at Lower Magnetic Field Requirements Than Baca 69
e. Levy's Mechanical Alignment System is Virtually Free 71
f. Summary 71
IV. Petitioner's Cited Prior Art 73
A. Berkley's Wallet (U.S. Publication No. 2017/0354229) 73
a. Overview 73
b. Berkley is Intended to Hold Magnetic (Credit) Cards 73
c. Berkley Discloses the Use of a Magnet to Attach the Wallet to the Smartphone 75
B. Baca's Rare Earth Magnetic Arrays (U.S. Publication No. 2016/0260532) 76
a. Overview 76
b. Baca Does Not Disclose a Wallet 79
c. Baca's Magnetic Mounting System 80
d. Baca's Use of Rare Earth Magnets — N48 and N52 Neodymium 85
e. Baca's Acknowledgment of Cost Concerns and Ferrous Insert Teaching 88
f. Summary 94
C. Zhu's Folio (Chinese Patent Application No. 108023992A) 95

a. Overview 95
b. Zhu's Back Plate and Magnet Groups 95
c. Zhu's Front Cover (Panel 230) 97
d. Zhu Discloses No Compartment, No Card Pockets, and No Content Removal Slot 98
e. Zhu Discloses No Ferromagnetic Shield or Card Protection Mechanism 100
f. Zhu Does Not Disclose Rare Earth Magnets 100
g. Summary 102
D. Kinshi's Folio (Japanese Patent Application No. 2015-4401) 103
a. Overview 103
b. Kinshi's Overall Architecture — Three Separate Structural Components 104
c. Kinshi's Open Pockets Are Not Compartments 106
d. Kinshi's Structural Separation of the Card Pockets on Cover Piece 2 and Magnets on Base Piece 3 108
e. Kinshi Discloses No Ferromagnetic Shield or Card Protection Mechanism 109
f. Summary 110
E. Goto's Card Holder (U.S. Patent No. 4,647,714) 111
a. Overview 111
b. Goto Identifies the Problem of Magnetic Field Corruption of Credit Cards 112
c. Goto's Magnetic Card Protection Case 113
d. Goto's Shielding Is Not Applicable to Open-Topped Sleeves or the '641's Directional Shield 115
e. Summary 117
V. Petitioner Fails to Show that the '641 Patent Claims Would Have Been Obvious 118

A. A PHOSITA Would Not Have Been Motivated to Apply Baca's Rare Earth Magnetic Arrays to the Wallet of Berkley 118

a. Applying Baca's Teaching of Using Rare Earth Magnetic Arrays to Berkley Would Destroy Berkley's Primary Use Case and the Known Problem of Magnetic Interference Teaches Away From Applying Baca's Multiple Array Teaching to Berkley's Wallet 119

i. Berkley's Purpose Is Carrying Credit Cards 119

ii. Credit Card Magnetic Stripe Sensitivity 120

iii. Baca's Rare Earth Magnetic Arrays Produce Fields That Exceed Damage Thresholds at Relevant Distances 121

iv. Berkley's Own Single Magnet Does Not Create This Problem 124

v. The Known Problem of Magnetic Interference Teaches Away From the Combination 127

b. Solving the Card Corruption Problem Requires a Ferromagnetic Shield, Adding Cost and Manufacturing Complexity That Negates the Motivation to Combine 130

i. Adding a Magnetic Shield Is Not a Trivial Addition 130

ii. The Shield Adds Material, Manufacturing Cost, and Increases Weight Significantly 135

iii. A PHOSITA Would Perform a Cost-Benefit Analysis and Find the Modification Not Worthwhile 141

iv. The Sequential Obviousness Argument Mischaracterizes the Engineering Reality 144

c. Baca's Rare Earth Magnet Arrays Are Significantly More Expensive Than Berkley's Existing Attachment, and Baca Itself Teaches Away From Using Multiple Rare Earth Arrays Due to Cost 161

i. Berkley's Attachment Mechanism Is Low Cost 162

ii. Baca's Magnetic Arrays Are Substantially More Expensive 163

iii. Baca Itself Identifies Cost as a Reason to Avoid Multiple Rare Earth Magnets 167

iv. Consumer Wallet Accessories Are Price-Sensitive Products 169

d. A PHOSITA Seeking Self-Alignment and Orientation Starting From Berkley Would Use Mechanical Alignment Features as Taught by Levy — Not Baca's Costly and Interference-Prone Magnetic Arrays 171

i. Self-Alignment Is Not Required by Berkley and No Problem With Its Absence Is Identified 171

ii. If a PHOSITA Did Want to Add Self-Alignment/Fixed Orientation to Berkley, Levy Provides the Obvious and Superior Solution 172

iii. Levy's Approach Is Superior to Baca's for Berkley's Use Case on Every Relevant Metric 175

e. Petitioner and Its Expert Identify No Genuine Motivation to Combine Berkley and Baca 185

f. The Claimed Invention Is Not Obvious 187

B. A PHOSITA Would Not Have Been Motivated to Apply Goto's Shield to the Folios of Zhu and Kinshi 189

a. The Geometry of Zhu and Kinshi's Open-Top Pockets 190

b. Adding Goto's Shield to Zhu and Kinshi Adds Significant Weight to the Folio 200

c. The Sole Rational Basis for Adding Goto's Shield Is Card Protection — And That Purpose Cannot Be Achieved 203

d. The Shield Fails in the Folio-Closed Position (Scenario A) — The Most Basic Operating Configuration 205

i. Dr. Phinney's Own Figure Reveals the Geometric Failure 205

ii. Application of the Governing Physical Principle 206

iii. This Alone Defeats the Motivation to Combine 207

e. The Shield Also Fails When the Folio Is Folded Back (Scenario B) — Confirming No Operating Configuration Exists in Which the Combination Works 208

i. The Folded-Back Position Brings Exposed Stripe Portions Into Proximity With the Phone Side Panel Magnets 208

ii. The Back-Side Shield Cannot Intercept the Relevant Field Path 212

iii. Goto's Attenuation Rationale Does Not Apply to the Open-Top Folio Geometry 214

iv. The Folded-Back Position Is Geometrically Variable and Transient 216

f. Operating Configurations Exist in Which the Proposed Combination Cannot Achieve Its Intended Purpose 217

g. Actual Testing Confirms the Corruption of Magnetic Cards by Regular and Low Grade Rare Earth Magnets 219

C. Neither Zhu Nor Kinshi Disclose a Compartment (all claims) 230

a. The Claim Term "Compartment" Means an enclosed space for holding cards, money, etc. 230

b. Zhu and Kinshi's Open-Top Pockets Do Not Satisfy This Construction 235

c. The Open-Top Design Is Inconsistent With the Purpose the Compartment Serves in the Claims 236

D. Neither Zhu Nor Kinshi Disclose a "Content Removal Slot" (Claim 2) 238

a. Claim 2 Requires a Content Removal Slot as a Structure Separate and Distinct From the Compartment Itself 238

b. Zhu and Kinshi Do Not Disclose Content Removal Slot 243

i. Zhu's Panel 230 Provides No Textual or Structural Basis for a Content Removal Slot 243

ii. Zhu's Ovals Cannot Be Both Compartments and Content Removal Slots 244

iii. Dr. Phinney Points to the Same Structure in Kinshi for Both Claim Elements — A Double-Use That Violates Claim Differentiation 245

iv. Kinshi's Pocket Opening Is the Compartment Opening — Not a Separate Slot 247

E. The Combination Therefore Fails to Render the Claims Obvious 248

VI. Objective Evidence of Nonobviousness Exists 251

A. 1LSS's Products are Coextensive with, and have the Required Nexus Between, the Products and Claim Inventions 252

B. Commercial Success 252

C. Long-Felt But Unmet Need 254

D. Industry Skepticism 254

E. Copying by Competitors 256

F. Unexpected Results 256

VII. Conclusion 259

I. INTRODUCTION AND QUALIFICATIONS

1. I, R. Glenn Akhavein, P.E., hereby declare as follows:

2. I have personal knowledge of the facts and opinions set forth in this declaration, and if called upon to do so, I would testify competently thereto.

3. I am over the age of eighteen (18) and competent to make this Declaration.

4. I have been retained by Patent Owner 1LSS, Inc. to provide assistance, analysis, and opinions regarding IPR2025-01180 and U.S. Patent No. 11,864,641 ("the '641 Patent") as an expert in the field of accessories for mobile devices, including those claimed in the '641 Patent. Attached hereto as Appendix A is a true and correct copy of my curriculum vitae describing my background and experience.

5. I have been asked to evaluate the validity of the '641 Patent in light of the assertions found in Petitioners Apple Inc.'s ("Petitioner") Petition for *Inter Partes* Review of U.S. Patent No. 11,864,641 Under 35 U.S.C. §§ 311-319 And 37 C.F.R. § 42 ("Petition"). (*See* Paper 1) To this end, below are my opinions, and their underlying bases, regarding the person of ordinary skill in the art at the time of the claimed inventions ("PHOSITA"); the fields of accessories to personal electronic devices, including wallets and their components such as the magnetic

arrangements claimed in the ‘641 Patent; the ‘641 Patent; claim construction; the prior art of record; and the validity of the ‘641 Patent, including why the prior art does not render obvious the claims of ‘641 Patent and why a person of ordinary skill would not have been motivated to make the prior art combinations asserted by Petitioner.

A. Technical Qualifications

6. My technical background and experience are described in my curriculum vitae, attached as **Exhibit A** to this Declaration. In Exhibit A, I provide a list of my product design experience, as well as a list of expert testimony that I have provided in previous matters.

7. I received Bachelor of Science degree in Mechanical Engineering, North Carolina State University.

8. I am a Licensed Professional Engineer in the State of Florida, License Reg. No.73171**.**

9. I am a named inventor on 13 U.S. patent applications and 10 issued U.S. patents. This includes application US20230132840A1, *Apparatus and Method for a Magnetic Therapeutic Bracelet*. A therapeutic bracelet that uses high-power neodymium magnets in a concentric alternating pole arrangement to interact with the median nerve and PC6 junction to elicit a pain reduction response.

10. I have more than 35 years of experience designing, developing, testing, and manufacturing products that include everything from sippy cups to fighter jet components. My experience includes:

- RFID badge holder –ME and design – "2008 Good Design Award" http://www.idstronghold.com Identity Stronghold is the leading company in RFID shielding products including Badge Holders, Men's and Women's Wallets, Credit Card and Passport Sleeves, and much more. I helped design the badge holders and wallets that incorporate shielding into the design so that they are safe from being skimmed or corrupted.
- Co-founder and CEO of MediMags magnetic therapeutic bracelets – Mechanical design, industrial design, engineering, FEA analysis, product testing, sourcing, manufacturing support, marketing, and investment funding for new magnetic therapeutic bracelet that alleviates the pain associated with menstrual cramps. https://medimags.com/

  As a co-inventor and the designer of this product, I designed the concentric alternating pole arrangement of the magnets, specified the

magnet type, size and shape for achieving the necessary penetration. I have been responsible for the entire process from the early conceptual design, testing, prototyping magnetic housings and bands, to sourcing the magnets, and designing the custom manufacturing machines needed to separate these high-power neodymium magnetic assemblies.

I have also been directly involved in the case and accessory design and sourcing, as well as advertising and marketing of the product as we begin our launch.

- Expert Witness in class action suit against Apple regarding their MagSafe magnetically coupled power supplies. Conducted a forensic evaluation of the magnetic connector including magnetic strength, layout, and connector strain relief design and components showing that Apple had an inherent design flaw which was directly responsible for the power supply failures that were occurring.
- Magnetic controller for early digital tape measurer, roughly 1990. I designed a digital tape measurer that used a custom array of magnets and a read head to determine how much of the tape had been extended or retracted.

- Engineering Supervisor, Parker Hannifin Pneumatic Division, (largest US fluid power company). For six years I designed and tested solenoid valves ranging from small 3mm clean room valves to large press valves with 3-inch ports. These style valve use electromagnetic solenoids in direct acting or solenoid piloted configurations.

11. In addition to the decades of design and product development experience, I have 20 years' experience as a forensic engineer providing engineering analysis, product redesign, reverse engineering and expert witness testimony in the areas of Intellectual Property, Personal Injury and Wrongful Death, Product Liability, and Class Action.

12. Some of the relative forensic engineering experience that specifically relating to IP cases involving consumer products:

- IPR case in Ninebot, (current owners of Segway), v. Inventist Inc. Analyzing current design of the One S2, for Ninebot in the matter of the Inter Partes Review U.S. Patent No. 8,807,250. Compared the design and control system of the One S2, (http://www.ninebot.com/Product-s2.html), and compared that to the claim language within the '250 patent and filed a declaration on behalf

of Ninebot.

- ITC case involving my client suing the largest manufacturer of nasal irrigation devices in the world, Navage. Responsible for review of five patents, creation of claims charts, complete functional testing, and infringement report, along with anticipated rebuttals to opposing counsel's invalidity and non-infringement reports for Plaintiff.
- Case involving Shark Ninja and Dyson. Reviewed current claim construction filing and have written first claims construction report for Plaintiff, SharkNinja. I filed a Claim Construction declaration for the Plaintiff, SharkNinja, and have been deposed in this case.
- The two largest wheelchair manufacturers, Invacare Corp v. Sunrise Medical, are suing over patent infringement regarding an anti-tipping suspension system for motorized wheelchairs. Defendant, Sunrise, hired me to evaluate the designs and patents. Filed an Invalidity report regarding seven Invacare patents and was deposed in the case.

13. Regarding my litigation experience, I have been involved in 25 cases for Plaintiffs, 10 for Defendants, filed 36 reports, and been deposed 17 times. I

have never had any or all of my opinions or testimony disqualified, nor have I ever been disqualified as an expert.

B. Materials Reviewed

14. My analysis in this Declaration is based on my knowledge and experience. Based on my above-described qualifications, the Patent Trial and Appeal Board should consider me to be an expert in the field. Also, based on my experiences, I understand and know of the capabilities of persons of ordinary skill in this field at the time of the claimed inventions, *i.e.*, September 25, 2018 ("Critical Date").

15. As part of my independent analysis for this Declaration, I have considered the following: the '641 Patent (EX1001) and its prosecution history (EX1002); the background knowledge/technologies that were commonly known to persons of ordinary skill; my own knowledge and experience gained from my work in the field; my experience in advising others in this field; and my experience working with others involved in this field. In addition, I have reviewed and analyzed the Petition (Paper 1), publications and materials listed in the Petition, including the Declaration of Dr. Joshua Phinney (EX1003), and publications and materials cited in this Declaration.

16. To the best of my knowledge, the above-mentioned documents and materials are true and accurate copies of what they purport to be. An expert in the field would reasonably rely on them to formulate opinions such as those set forth in this declaration.

C. Compensation

17. I am being compensated at my normal hourly rate for my time spent on this proceeding and for expenses incurred as a result of my role as an expert. My compensation is not in any way contingent on my performance, the result of this proceeding, or any of the issues involved therein. I have no financial interest in the outcome of this case.

D. Legal Standards Applied

18. I am an engineer by training and profession. The opinions I am expressing in this report involve the application of my engineering knowledge and experience to the evaluation of certain prior art with respect to the '641 Patent. My knowledge of patent law is no different than that of any lay person. Therefore, I have requested the attorneys who represent the Patent Owner, to provide me with guidance as to the applicable patent law in this matter.

19. The paragraphs below express my understanding of how I must apply current principles related to patent validity to my analysis.

20. I understand that the claims of an issued patent are presumed to be valid. The basis for the presumption of validity is the fact that the allowed claims went through a rigorous examination process at the U.S. Patent Office.

21. I understand that Petitioner has the burden of proving invalidity by a preponderance of the evidence, and that the burden of proof never shifts to the Patent Owner to prove the validity of the ’641 Patent.

22. I understand that an inventor establishes priority of an invention by conceiving of the invention and reducing the invention to practice.

23. I understand that a patent application may establish priority of invention when it supports all elements of the asserted claims.

24. It has further been explained to me by counsel for Patent Owner that a claim is obvious pursuant to 35 U.S.C. § 103 if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. As such, I understand that a claim is valid unless the differences between the claimed invention and the prior art are such that the subject matter as a whole would have

been obvious at the time the invention was made to a person having ordinary skill in the art to which the claimed invention pertains.

25. It has further been explained to me by counsel for Patent Owner that the following factors are used to make an obviousness determination: (i) the scope and content of the prior art; (ii) the level of ordinary skill in the art; (iii) the differences between the claimed invention and the prior art; and (iv) objective or secondary considerations of nonobviousness. Any relevant objective factors or secondary considerations of non-obviousness, which may include commercial success of a product using the invention, if that commercial success is due to the invention; long-felt need for the invention; evidence of copying of the claimed invention; industry acceptance; the taking of licenses under the patent by others; initial skepticism; failure of others; and praise of the invention.

26. I understand that when a patentee can demonstrate commercial success, usually shown by significant sales in a relevant market, and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention. I also understand that courts may find the commercial success of the infringer and other

members of the industry persuasive even though the patentee was not successful with a product covered by the patent.

27. I understand that a patent claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. But multiple prior art references or elements may, in some circumstances, be combined to render a patent claim obvious.

28. I understand that I should consider whether there is an "apparent reason" to combine the prior art references or elements in the way the patent claims. Requiring a reason for the prior art combination protects against the distortion caused by hindsight. Along the same lines, one cannot use the asserted patent as a blueprint to piece together the prior art in order to combine the right ones in the right way as to create the claimed inventions. To determine whether such an "apparent reason" exists to combine the prior art references or elements in the way a patent claims, it will often be necessary to look to the interrelated teachings of multiple patents, to the effects of demands known to the design community or present in the marketplace, and to the background knowledge possessed by a person having ordinary skill in the art.

29. It has further been explained to me by counsel for Patent Owner that the motivation to combine must be more than mere conclusory statements and that a generic motivation to combine known elements is insufficient to establish obviousness. I understand that the motivation to combine prior art references must be identified in the Petition.

30. I understand that when the prior art "teaches away" from combining prior art references or certain known elements, discovery of a successful means of combining them is less likely to be obvious. A prior art reference may be said to "teach away" from a patent when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the patent or would be led in a direction divergent from the path that was taken by the patent.

31. I understand that in developing opinions as to whether or not certain claimed subject matter would have been obvious, each claim of a given patent should be considered in its entirety and separately from any other claims. In so doing, it is my further understanding that while I should consider any differences between the claimed invention and the prior art, I should also assess the obviousness or non-obviousness of the entirety of a claim covering an alleged invention, not merely some portion of it

32. I am informed that claim terms are construed under the standard provided by the U.S. Court of Appeals for the Federal Circuit in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); 35 C.F.R. § 42.100(b). I am informed that under this standard claim terms are presumed to have their ordinary and customary meaning in light of the patent's specification as understood by a person of ordinary skill in the art at the time of the invention, unless (1) the patentee acts as its own lexicographer by setting out a definition in the specification, or (2) the patentee disavows the full scope of a claim term in either the specification or during the prosecution of the patent.

33. For the purposes of this IPR, I have interpreted the claim terms as they would have been understood by a person having ordinary skill in the art considering the context of the claims themselves, the specifications, the figures, the prior art, and the prosecution history. Consistent with these constructions and interpretations, I have considered the claims in light of their ordinary meaning to one skilled in the art and consistent with my experience in the relevant field given its ordinary and customary meaning as they would be understood by a PHOSITA in the context of the '641 Patent's specification and prosecution history.

34. I understand that under the principle of claim differentiation, a dependent claim is presumed to have a scope different from the independent claim from which it depends.

35. I understand that a claim construction that renders a dependent claim superfluous is disfavored and should be rejected.

E. Definition of PHOSITA

36. I understand that my interpretation of the patent claims and my validity analysis must be undertaken from the perspective of a hypothetical person of ordinary skill in the art at the time of the claimed inventions or PHOSITA. In determining the characteristics of a hypothetical person having ordinary skill in the art of the asserted patents at the time of the claimed inventions, I considered several things, including the type of problems encountered in the art, the solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the education level and experience of people working in the field. It has further been explained to me by counsel for Patent Owner that the relevant timeframe is in or around September 25, 2018.

37. Based on my experience, it is my opinion that a person of ordinary skill in the art at the time of the invention of the '641 Patent would have had a Bachelor's Degree in mechanical or electrical engineering with 2-3 years of

experience in the design and manufacture of consumer electronics accessories or mobile device peripherals, or equivalent industry experience. An individual with less technical education but more experience, or vice versa, could also qualify as a person of ordinary skill in the art.

38. Given my education and professional experience described above and, in my curriculum vitae, I am in a position to opine on the understanding of a person of ordinary skill in the art of the '641 Patent.

II. SUMMARY OF OPINIONS

A. Berkley/Baca Grounds

39. The Berkley-Baca based grounds (1A-1E) fail because a PHOSITA as of the priority date of September 25, 2018 would not have been motivated to modify Berkley with Baca's rare earth, multi-magnet alternating polarity arrays for four independent and cumulative reasons:

- The proposed substitution would corrupt the magnetic stripes of the credit cards Berkley is designed to carry, destroying the device's primary use case — a result a PHOSITA would foresee and avoid; the known problem of magnetic interference, confirmed by Petitioner's own evidence, teaches away from the combination.

- Solving the resulting card corruption problem requires adding a ferromagnetic shield, increasing cost and manufacturing complexity to a degree that negates any benefit of the modification.
- Baca's rare earth magnet arrays are significantly more expensive than Berkley's existing attachment mechanism, and Baca itself teaches away from using multiple rare earth arrays by recommending ferrous inserts as a cost-reduction measure.
- A PHOSITA seeking to add orientation control to the wallet of Berkley would use mechanical alignment features as taught by Levy — a simpler, significantly less expensive solution that avoids magnetic interference entirely.

B. Zhu/Kinshi Grounds

40. The Zhu/Kinshi-based grounds (2A and 3B) fail for three independent and cumulative reasons:

- There is no motivation to combine Zhu or Kinshi with Goto: Goto's shielding provides zero net protection in the operating configurations of the Zhu and Kinshi folio wallets because the open-top pocket geometry of Zhu and Kinshi’s pockets leaves the magnetic stripe

exposed — and any stripe exposure means total corruption. A PHOSITA who understood magnetic shielding principles would recognize this incompatibility before making the combination. Without any benefit, adding the shield's cost and manufacturing complexity has no rational basis.

- The claimed "compartment" is not disclosed: Zhu and Kinshi's open-top pockets are sleeves, not compartments — they are not bounded spaces "partitioned off" in any meaningful sense under a specification-informed *Phillips* construction, and construing them as compartments would allow the shield/compartment relationship the claims require to be satisfied by a structure that is open to the field source.
- Claim 2 not rendered obvious: neither Zhu nor Kinshi discloses a content removal slot as a structure distinct from the purported compartment. Zhu's panel 230 is silent on any slot structure. Kinshi's single pocket opening cannot simultaneously supply the separate content removal slot required by dependent claim 2.

III. OVERVIEW OF THE TECHNOLOGY

A. The '641 Patent

a. The Specification

41. The '641 Patent relates to a mobile device accessory (*e.g.,* wallet) for attachment to a mobile device. EX1001, Abstract. The '641 Patent explains that "[l]ike cell phones, wallets are an integral part of daily life" and that "[w]allets come in a variety of sizes and configurations for organizing and securing credit cards, cash, checks, identification, photos, and other possessions." *Id*., col. 1:31-34. The '641 Patent further explains that "[a] cell phone and wallet are the two important items that people carry with them throughout their day" because "it is sometimes necessary to have one's wallet close by to pay tolls or swipe a badge to enter a parking garage." *Id*., 1:35-46. The specification further defines "wallet" as "any apparatus for holding at least one of a credit card, cash, identification, a check, a badge, a picture, a key, a piece of paper, a coupon, business cards, and combinations thereof." *Id*., col. 7:3-7.

42. The '641 Patent discloses that the wallet has a compartment, as shown in FIG. 14B, for "hold[ing] a plurality of credit cards 10 in an amount from 1 to 8 credit cards, in an amount of at least 2 credit cards, in an amount of at least 5 credit cards, in an amount from 3 to 10 credit cards, in an amount from 2 to 8 credit cards,

in an amount from 3 to 8 credit cards, in an amount from 4 to 8 credit cards, and/or in an amount from 3 to 8 credit cards." *Id*., col. 7:51-57. As shown in FIG. 9, the "compartment [is] formed between front portion 120, back portion 110, bottom portion 160, top portion 150, left portion 130 and right portion 140." *Id*., col. 9:3-7.

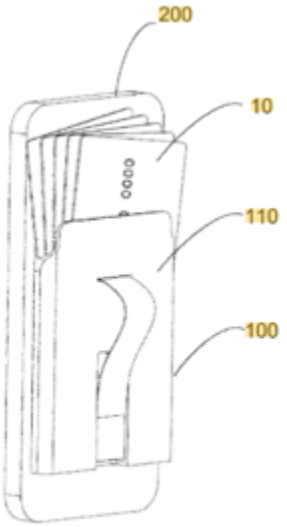


FIG. 14B

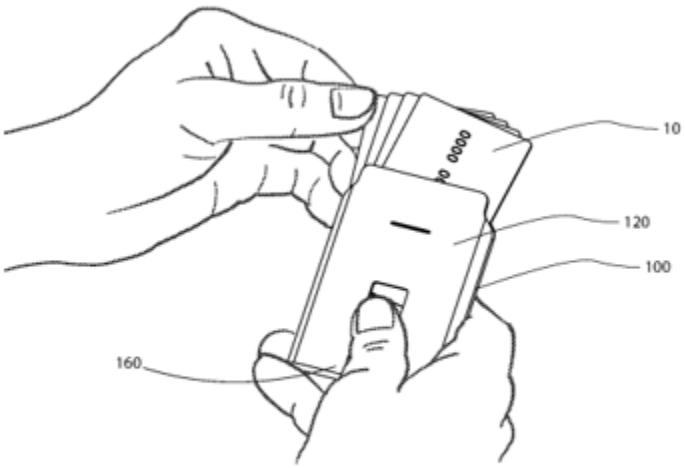


FIG. 9

43. As shown in FIG. 8A and 8B, the wallet includes "a content removal slot 126 that facilitates the removal of credit cards 10" by "plac[ing] their finger through the content removal slot 126 and slide credit cards 10 through the top portion 150 of wallet 100." EX1001, col. 8:57-62.

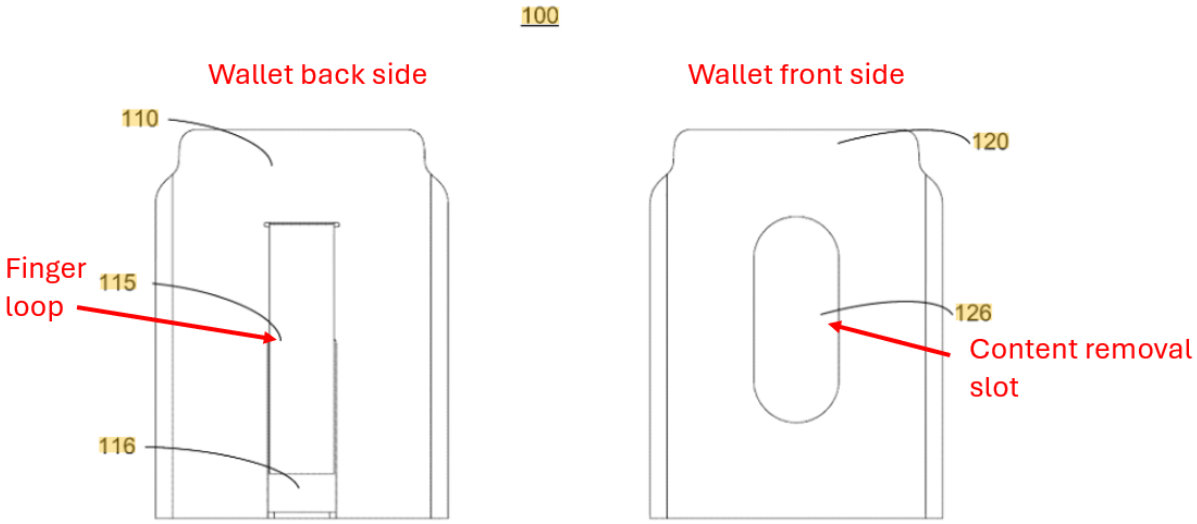


FIG. 8A FIG. 8B

44. As illustrated below, the wallet has a first arrangement of magnetic material (not shown but corresponding, for example, to top horizontal device magnets 210, FIG. 16A) with a first region exposing a first polarity magnetic field at the device side surface and a second adjacent region exposing an opposite polarity magnetic field at the device side surface. *Id*., FIG. 16A. The wallet also has a second arrangement of magnetic material (not shown but corresponding, for example, to vertical side device magnets of FIG. 16A) with a first region exposing a first polarity magnetic field at the device side surface and a second adjacent region exposing an opposite polarity magnetic field at the device side surface.

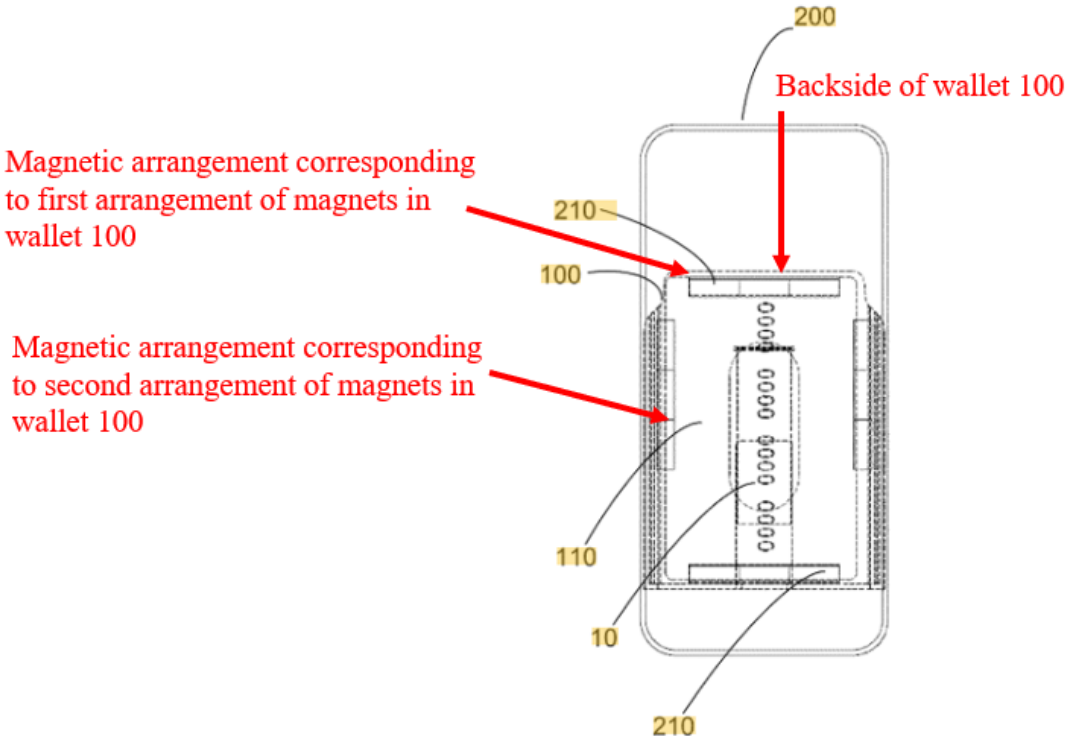


FIG. 16A

45. Collectively, the first and second arrangements, in use, magnetically couple the wallet (100) to a mobile device case (200) and cause the wallet (100) to adopt a specific orientation on the mobile device case (200). *Id*.

46. The specification discloses that "[m]agnets for the surface-side attachment 300, wallet 100, charging device 500, electronic display device case magnets (device-side attachments) 210, and any other accessory configured to attach to these devices are preferably made out of rare earth metals including alloys of neodymium or samarium-cobalt" and that "[r]are earth magnets are selected

based on their strongly magnetic properties that include a higher maximum energy product (related to magnetic flux per unit volume) than other types of magnets including ferrite and alnico magnets." *Id.*, col. 11:58-67. The specification further discloses that "Neodymium magnets of grade N48 and higher are preferred, and neodymium magnets of grade N52 and higher are more preferred." *Id.*, col. 11:67-12:2. The specification discloses that the surface-side of the preferred embodiments contain one or two rows of 5 magnets, e.g., FIGS. 40A-40F, and the device-side also contains one or two rows of 5 magnets, e.g., FIGS. 41A-41D.

Surface-side magnet arrangement

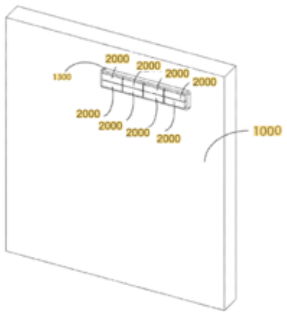


FIG. 40A

Device-side magnet arrangement

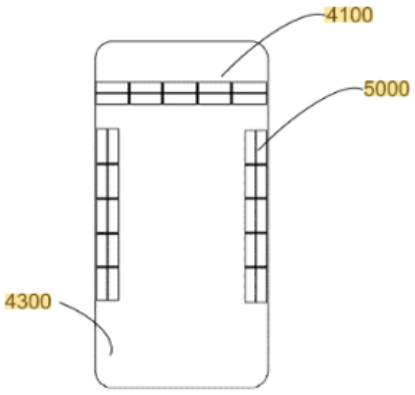


FIG. 41C

47. The '641 Patent discloses, and claims, a wallet having a first arrangement of magnetic material and a second arrangement of magnetic material, each arrangement having adjacent regions of opposite polarity exposed at the device side surface of the wallet. As shown in the '641 Patent's figures and described in its specification, the first and second arrangements are physically separated from one another on the wallet by a region of nonmagnetic material — and critically, that nonmagnetic region has a maximum cross dimension that is greater than the distance between any two immediately adjacent first polarity and opposite polarity regions within either the first or second arrangement individually. This specific geometric relationship — where the gap separating the two arrangements is larger than the spacing between adjacent poles within a single arrangement — is what produces the wallet's orientation-deterministic coupling behavior. When the wallet is brought into proximity with a complementary arrangement of magnets associated with a mobile device, the two arrangements on the wallet interact concurrently with the complementary mobile device magnets, and the combination of attractive and repulsive forces produced by that interaction drives the wallet into a specific orientation relative to the mobile device and holds it there. A single arrangement of alternating polarity magnets, without the separation

geometry the '641 claims, can resist a 180-degree flip but cannot fully constrain the wallet's translational and rotational position on the phone's back surface in two dimensions. That is, it does not produce a unique energy minimum that locks the wallet into one specific orientation. The dual arrangement with the claimed separation geometry does produce that unique energy minimum, because the spatial separation between the two arrangements creates a coupling pattern that is geometrically specific to one, or at most two, relative positions of the wallet on the device, preventing the wallet from settling into any unintended orientation during attachment. It is this specific architectural feature, *i.e.,* two separated arrangements with a nonmagnetic gap exceeding the internal pole spacing, that causes the wallet to adopt a specific orientation on the mobile device as required by the challenged claims, and that is not taught or suggested by any reference of record.

48. "The wallet includes a layered front section including a plurality of front layers" and "a layered back section including a plurality of back layers wherein the layered front side and the layered back side are arranged to form a compartment." *Id*., col. 2:66-3:4. "The plurality of front layers may further include a metallic front shield and the plurality of back layers may further include a metallic back shield." *Id*., col. 3:11-14. The specification explains that "[b]ack

shield 113 and front shield 123 protect magnetically sensitive credit cards from exposure to the magnetic fields created by back-side magnets 119, front-side bottom magnets 128, and front-side top magnets 129." *Id*., col. 8:11-14. As illustrated below, the ferromagnetic shield or metallic plate (*see e.g.,* shields 113 or 123, FIG. 3) is positioned between the wallet's magnetic arrangements (119, 128 and 129) and its compartment to protect magnetically sensitive credit cards stored in the compartment from exposure to the magnets' magnetic fields. *Id*., 8:11-14.

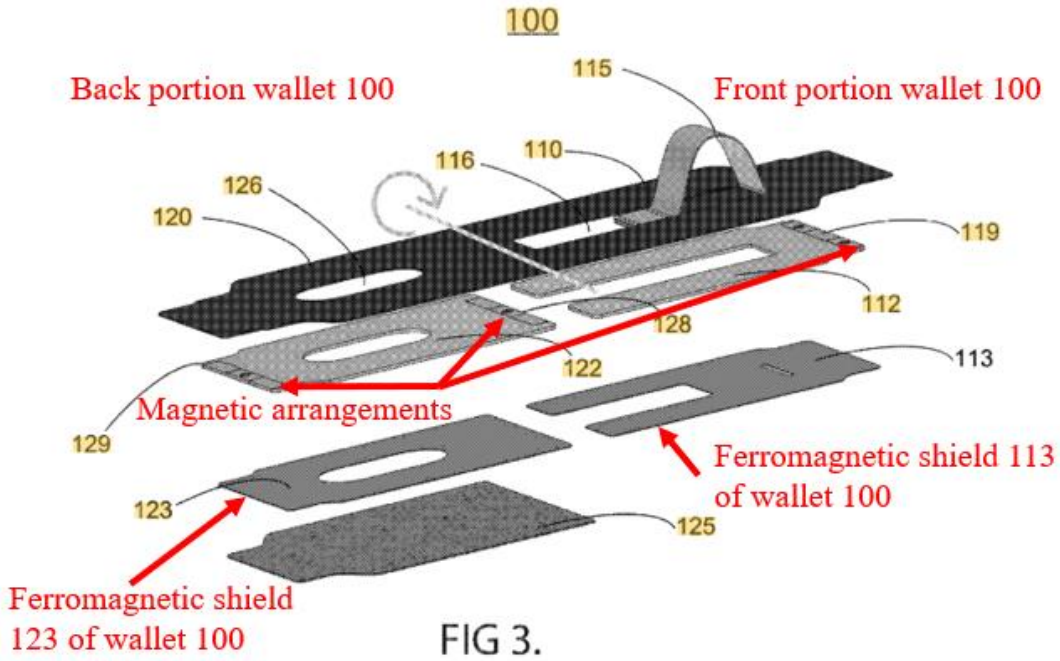


FIG 3.

b. The Claims

49. The claims of the '641 Patent are directed to a wallet for attachment to a mobile device. Claims 1-11 claim include a wallet having a first arrangement of

magnetic material with a first region exposing a first polarity magnetic field at the device side surface and a second adjacent region exposing an opposite polarity magnetic field. EX1001, 20:56-60. The claimed wallet further includes a second arrangement of magnetic material, featuring a first region exposing a first polarity magnetic field at the device side surface and a second adjacent region exposing an opposite polarity magnetic field. *Id*., 20:61-65. Claims 1-4, 6-10 further include a ferromagnetic shield positioned between the first and second magnetic arrangements and the compartment. *Id*., 20:66-67. In the wallet of claims 1-10, the first and second arrangements are physically separated on the wallet by a region of nonmagnetic material, which has a maximum cross dimension greater than the distance between any two immediately adjacent first polarity and opposite polarity regions in either the first or second arrangement. *Id*., 21:1-7. When in use, the first and second arrangements concurrently magnetically couple the wallet to a mobile device and cause the wallet to adopt a specific orientation on the device. *Id*., 21:8-12.

50. Claim 2 depends from claim 1 and recites that the wallet body has a content removal slot.

51. Claim 3 depends from claim 1 and recites that an attractive force between the first arrangement, the second arrangement and complementary arrangement of magnets associated with the mobile device are sufficient to support a weight of the mobile device.

52. Claim 4 depends from claim 1 and recites that the spacing between the first region and the second region in the first arrangement is less than 2 mm.

53. Claim 5 recites the same limitations as claim 1, except it recites a metallic plate positioned between the first magnetic arrangement and the compartment rather than a ferromagnetic shield between the first and second arrangements and the compartment. *Id*., 21:36-37.

54. Claim 6 depends from claim 1 and recites that the device side surface is substantially planar and an attachment surface of the mobile device is also substantially planar.

55. Claim 7 depends from claim 1 and recites that the first and second arrangement permit coupling to the mobile device in exactly one orientation.

56. Claim 8 depends from claim 1 and recites that the first and second arrangement permit coupling to the mobile device in exactly two orientations.

57. Claim 9 depends from claim 1 and recites a finger loop on a surface opposite the device side surface.

58. Claim 10 depends from claim 1 and recites that the body defines an opening into the compartment and wherein a material defining the opening tapers towards a long axis of the body at the opening to expose a content of the compartment at the opening.

59. Claim 11 also claims a wallet for attachment to a mobile device having a body defining a compartment and first and second arrangement of magnetic materials recited in claim 1. EX1001, 21:22. However, the wallet of claim 11 does not include the ferromagnetic shield and region of nonmagnetic material limitations of claim 1 nor the metallic plate of claim 5, but instead recites that the first magnetic arrangement has at least one of a different orientation or a different geometric pattern than the second arrangement and wherein the first and second arrangements, in use, concurrently magnetically couple the wallet to a mobile device and wherein the first and second arrangements cause the wallet to adopt a specific orientation on the mobile device. *Id*., 22:35-37.

c. The Prosecution History

60. During prosecution of the application that issued as the '641 Patent, the Examiner rejected the pending claims as obvious under 35 U.S.C. § 103 over

multiple combinations of prior art references, including Berkley in view of Baca and Berkley in view of Levy. Applicant appealed to the Patent Trial and Appeal Board, which issued a Decision on Appeal affirming the Examiner's rejection of certain claims and reversing others. EX1002, 437-460. The Board's decision is instructive on several points relevant to the present IPR proceeding — both in identifying the specific limitations the prior art combinations failed to teach and in confirming the significance of the magnetic arrangement to the specific orientation requirements of the claims.

i. Claims 1, 3-5, 7, and 11[1] - The Berkley-Levy Rejection

61. The Examiner relied on Berkley as disclosing a wallet for attachment to a mobile device comprising a body defining a compartment, a device side surface, and a magnetic arrangement that in use magnetically couples the wallet body to a mobile device. The Examiner found that Berkley's single magnet disclosed at paragraph [0029] — which enables the wallet compact to attach to corresponding magnets on a smartphone — discloses a magnetic arrangement that in use magnetically couples the accessory to a mobile device and causes the

[1] Claim numbers refer to the prosecution claim numbers and not the issued claim numbers in the '641 Patent.

accessory to adopt a specific orientation on the mobile device, citing the specific orientation shown in Berkley's drawings.

62. For the remaining limitations of claim 1 — including the first and second arrangements of magnetic material and the requirement that those arrangements cause the wallet to adopt a specific orientation — the Examiner relied on Levy. The Examiner found that Levy discloses a first arrangement and a second arrangement of magnetic material as recited in claim 1, and that Levy's arrangements cause the accessory to adopt a specific orientation on the mobile device.

63. Applicant argued that every embodiment disclosed in Levy "uses a male/female keying arrangement to both define the orientation between the charger and the mobile device and to mitigate shearing and rotational forces." Applicant contended that there is no teaching or suggestion in Levy that the first and second magnetic arrangements collectively cause the wallet to adopt a specific orientation on the mobile device — rather, it is Levy's mechanical protrusion and tabs that are entirely responsible for the orientation adopted by the case on the mount, not the magnets.

64. The Board agreed with Applicant and did not sustain the combination of Berkley and Levy rejection of claim 1. The Board examined Levy's disclosure in detail and found that Levy discloses a shaped protrusion on the mount having a plurality of alignment and anti-rotation tabs spaced around its perimeter, and a correspondingly shaped recess on the case having cut-outs to receive the tabs. The Board held that it is this protrusion-and-recess mechanical keying system that ensures the case remains properly oriented relative to the mount and is restrained from moving. The Board concluded: "Based on the foregoing disclosure in Levy, we find that Levy's protuberances and recesses, not the magnets, cause the orientation of the electronic device in mount 106." Because the Examiner's rejection relied on Levy to satisfy the claim 1 limitation that the first and second arrangements *cause* the wallet to adopt a specific orientation, and because the Board found that in Levy it is the mechanical features, not the magnetic arrangements, that cause the orientation, the Board held that the Berkley and Levy combination did not satisfy claim 1 as written. The Board accordingly reversed the Examiner's rejection of claims 1, 3-5, 7, and 11 on the Berkley and Levy ground, as well as dependent claims 2, 6, and 10 whose rejections depended on the same deficiency in the base rejection of claim 1.

65. This finding is significant for the present proceeding. The Board's holding confirms that claim 1's requirement that the magnetic arrangements *cause* a specific orientation is a meaningful and substantive limitation that is not satisfied merely by disclosing magnets in proximity to a mechanical orientation system. For the claimed invention's orientation requirement to be met by magnetic means, the magnetic arrangements themselves — not any accompanying mechanical features — must be what drives the wallet into and holds it in a specific orientation on the mobile device.

ii. Claims 1, 3-5, 7-9, and 11 - The Berkley-Baca Rejection

66. The Examiner relied on Berkley for disclosing many of the limitations of claim 1, arguing that Berkley discloses a wallet body defining a compartment, a device side surface, and a magnetic attachment mechanism. The Examiner relied on Baca for disclosing "a magnetic attachment mechanism for coupling a structure to an electronic device case, and the use of a first arrangement of magnetic material having a first region exposing a first polarity magnetic field at a surface and a second adjacent region exposing an opposite polarity magnetic field at that surface." The Examiner further argued that Baca similarly discloses a second arrangement of magnetic material as recited in claim 1, and that the first and second arrangements

cause the accessory to adopt a specific orientation on the mobile device, citing Baca paragraphs [0083]-[0084].

67. For the requirement that the wallet have two physically separated arrangements on a single accessory — analogous to the wallet side of the claimed combination — the Examiner acknowledged that Baca does not explicitly disclose using multiple surface-side magnetic attachments in combination with multiple device-side magnetic attachments. The Examiner nevertheless found that multiple surface-side magnetic attachments spaced apart in similar fashion to Baca's device-side attachments "would clearly be capable of concurrent attachment as claimed with an appropriate set of device-side attachments." The Examiner characterized adding a second array to Berkley's wallet as "at most a mere duplication of parts" or "at most a mere rearrangement of parts."

68. The Examiner further reasoned it would have been obvious to use a plurality of device-side attachments on the wallet body of Berkley "in order to provide a strong and self-orienting connection, for the other art known benefits of the Baca structure" or alternatively "as a mere selection of an art appropriate magnetic arrangement to use."

69. In response, Applicant argued that Baca is non-analogous art and therefore cannot properly serve as a basis for an obviousness rejection. Applicant contended that the field of the invention is the "attachment of mobile accessories to be carried with the mobile device," specifically wallets designed to be magnetically connected to mobile devices and transported therewith, while Baca is in a different field because it "relates to a surface mount for a smart phone to allow it to be mounted to e.g., an automobile dashboard." Applicant further argued that Baca is not reasonably pertinent to the problem solved by the claimed invention, which Applicant characterized as "the problem of shear and radial forces that tend to detach accessories attached to mobile devices during use." Applicant contended that a person of ordinary skill in the art would have understood that Baca's surface mount "experiences a different force profile than hand carried items" and that "the same forces sought to be overcome in a mobile environment (e.g. radial forces) are used to ease the detachment of devices from surface mounts."

70. The Board rejected Applicant's non-analogous art argument and found that Baca is analogous art. The Board found that a reference is analogous art if it is either in the field of the applicant's endeavor or reasonably pertinent to the particular problem with which the inventor was concerned. The Board found that

both prongs were satisfied. As to the field of endeavor, the Board noted that Baca discloses mounting a mobile device to an automobile dashboard and that Applicant's own specification similarly discloses an embodiment where a mobile phone with attached wallet is mounted to an automobile dashboard, citing the '641 specification's Figure 18 and paragraph [0092], which the specification describes as advantageously able to "mount two items" in either portrait or landscape orientation. Because both Baca and the present application disclose mounting a mobile device to an automobile dashboard, the Board found that Baca is in the field of Applicant's endeavor. The Board also noted that Baca, like the present application, is assigned to Applicant and that the inventor listed on Baca is one of the inventors of the present application — further confirming that Baca falls within the field of Applicant's endeavor.

71. Applicant next argued that even if Baca is analogous art, it "teaches that the magnetic attachment to the device side surface is a single array of magnetic elements" and does not teach any device or wallet with "two distinct arrangements of magnets as required by claim 1."

72. The Board sustained the Examiner's rejection of claim 1 over Berkley and Baca. The Board accepted the Examiner's finding that Baca's paragraph [0064]

explicitly discloses the use of multiple surface-side magnetic arrays, and found that Applicant did not dispute this finding. The Board accepted the Examiner's reasoning that multiple surface-side attachments shown in Baca would clearly be capable of concurrent attachment with an appropriate set of device-side attachments, and that adding a second set of device-side attachments to Berkley's wallet is either a mere duplication of parts or a mere rearrangement of parts, neither of which patentably distinguishes the claimed invention from the prior art in the absence of evidence of unexpected results.

73. The Board found that Applicant failed to address the Examiner's reasoning or provide evidence that the claimed dual arrangement yields unexpected results. On that basis the Board sustained the Examiner's rejection of claims 1, 3-5, and 7-9 over Berkley and Baca.

iii. What the Board Did Not Address

74. Significantly, the Board's decision does not address: (1) whether Baca's specific teaching of using arrays of rare earth magnets (*e.g.*, N48+ neodymium) teaches away from combining Baca's magnetic arrays with Berkley's credit card wallet due to the known risk of magnetic stripe corruption; (2) whether the high cost of Baca's rare earth arrays, which Baca itself acknowledges and proposes to mitigate through use of ferrous inserts, provides a reason a PHOSITA

would not make the substitution; (3) whether the availability of Levy's mechanical alignment approach as a lower-cost, card-safe alternative to Baca's arrays undermines the motivation to combine Berkley with Baca; or (4) whether Berkley's own disclosure of a single magnet as adequate for its wallet-on-phone application defeats any motivation to upgrade to Baca's expensive rare earth array system.

75. These arguments, supported by the expert testimony and technical evidence presented in this proceeding, were not before the Board and do not fall within the scope of the Board's prior holding. The non-obviousness arguments presented here, and the present record with its full evidentiary development of these specific points, provides a substantially different basis for the Board's consideration than was available in the *ex parte* appeal.

iv. Claims 2 and 6 - The Ferromagnetic Shield and Metallic Plate

76. Claim 2 depends from claim 1 and adds the requirement of a ferromagnetic shield between the first and second magnetic arrangements and the card compartment. The Examiner proposed that it would have been obvious to add a ferromagnetic shield to the Berkley and Baca combination based on the teachings of Sartee. The Examiner found that Sartee discloses forming a similar body defining a compartment and the use of a ferromagnetic shield between an interior

surface of the body and a plurality of magnets used to attach an object to the compartment, citing Baca paragraphs [0081] and [0128] and Figures 12C and 12D. The Examiner determined it would have been obvious "to add a ferromagnetic shield as taught by Sartee between the first and second arrangements and the compartment."

77. Applicant contended that Sartee "is a flat tablet cover, it forms no compartment" and that there is nothing in Sartee that is analogous to the claimed structure, its compartment, or its shield. Applicant further contended that Sartee does not disclose "a ferromagnetic shield between the first and second arrangements and the compartment," noting that Sartee's shunt is internal to the tablet and designed to concentrate magnetic flux between the magnets on the cover attached to the tablet and the magnets within the tablet to which they connect, not to shield a card compartment from magnetic fields.

78. The Board reversed the rejection of claim 2. Examining Sartee's disclosure in detail, the Board found that Sartee discloses a cover that is magnetically attached to a tablet device, with magnets and a magnetic shunt positioned within the tablet assembly. The Board found that the Examiner failed to identify what component in Sartee corresponds to the recited "compartment," noting

that the ordinary meaning of compartment is "a part or space marked or partitioned off" and that Sartee's tablet does not correspond to a compartment in that sense. The Board further found that Sartee does not disclose that the magnetic shunt is positioned between the magnets and a component analogous to the claimed compartment. Rather, Sartee's shunt is positioned in the vicinity of the tablet's Hall Effect sensors, not between the magnets and a card-carrying space. The Board therefore concluded that the Examiner had not adequately explained how combining the teachings of Sartee with Berkley and Baca accounts for the specific limitation of claim 2, a ferromagnetic shield positioned between the first and second magnetic arrangements and the compartment, and reversed the rejection accordingly.

79. Claim 5 is structurally parallel to claim 2 but substitutes a metallic plate for the ferromagnetic shield. Claim 5 depends from claim 1 and recites a metallic plate between the first magnetic arrangement and the compartment. Like the ferromagnetic shield of claim 2, the metallic plate of claim 5 is positioned between a magnetic arrangement and the card compartment, serving to attenuate or redirect magnetic fields that would otherwise reach the compartment's contents. The Examiner's rejection of claim 5 relied on the same combination and the same

reasoning as the claim 2 rejection, Berkley in view of Baca and Sartee, with Gluck added in one ground. The Board reversed claim 5 for the same reasons given for its reversal of claim 2.

80. The Board's reversals of the claim 2 and claim 5 rejections are significant for this proceeding for two related reasons. First, they confirm that the specific structural placement of a shielding element, whether a ferromagnetic shield or a metallic plate, between the magnetic arrangements and the card compartment is a non-trivial claim limitation that is not taught by any reference in the record of prosecution. The prior art discloses magnets and shielding elements in various configurations, but no reference teaches the specific integrated architecture in which a shielding element is interposed between alternating polarity magnetic arrangements on one side and a card-carrying compartment on the other, in the context of a wallet accessory for a mobile device.

v. Claim 12 — Different Orientation or Different Geometric Pattern

81. Claim 12 therefore shares the core architecture of claim 1 — dual magnetic arrangements that concurrently cause a specific orientation, but adds the specific requirement that the two arrangements differ from one another in at least one of orientation or geometric pattern. This asymmetry between the two

arrangements is what produces the single-orientation coupling behavior described in the specification where the wallet can attach to the mobile device in only one specific orientation rather than in two orientations that are 180 degrees apart.

82. The Examiner relied on Berkley in view of Baca and Levy for the base combination establishing the dual arrangement architecture and the magnetic causation of specific orientation, as articulated for claim 1. For the additional limitation of claim 12, that the first magnetic arrangement has at least one of a different orientation or a different geometric pattern than the second arrangement, the Examiner relied on Levy. Specifically, the Examiner found that Levy "teaches different magnetic arrangements having different orientation, noting for example the top left and the top right or bottom left arrangements corresponding to FIG. 8A have different orientations, as do any two of the arrangements corresponding to FIG. 9A." For the second wherein clause of claim 12, that the first and second arrangements cause the wallet to adopt a specific orientation, the Examiner found this limitation disclosed "per Levy."

83. Applicant raised several arguments against the claim 12 rejection.

84. On the first wherein clause, different orientation or different geometric pattern, Applicant conceded that Figure 9A of Levy "arguably teaches"

the first wherein clause, acknowledging that Levy's triangular magnet arrays in Figure 9A have different orientations relative to one another. Applicant thus did not seriously contest that the prior art discloses two magnetic arrangements having different orientations or geometric patterns.

85. On the second wherein clause, that the arrangements cause the wallet to adopt a specific orientation, Applicant argued that "there is no suggestion in Levy the arrangements cause the wallet to adopt a specific orientation (it is the protrusion and tabs that cause a specific orientation)" mirroring the argument Applicant made successfully against the Berkley and Levy rejection of claim 1. Applicant further argued that "there is no reasonable way, taught or suggested, by the combination of how the orientation of Baca's singular linear array would be transformed into two distinct arrangements with different orientations."

86. The Applicant contended that the Examiner had yet to explain how or why a person of ordinary skill would take the single array of magnets from Baca's car dashboard mount and replace it with a plurality of arrays in different orientations or geometric configurations, arguing that "[s]ticking multiple independent arrays to the dashboard would result in an installation and usability problem to the point that such a problem would never be produced."

87. In its reply, the Examiner changed position on the second wherein clause and abandoned the reliance on Levy alone to satisfy it, instead relying on Baca combined with Levy to satisfy the second wherein clause. The Examiner explained that "Baca is the primary modifying reference, and Baca demonstrates the use of a magnetic attachment mechanism without the use of additional mechanical couplings and explicitly indicates that such mechanical couplings are optional/unnecessary," citing Baca paragraph [0020]. The Examiner explained that "the combination uses the multiple arrays taught by Baca and the teaching of Levy to locate four symmetrical arrangements in different orientations, which can be either straight arrays like those of Baca appropriately arranged or circular or triangular arrays like those of Levy."

88. The Board did not sustain the rejection of claim 12, reversing it for reasons that parallel and reinforce the Board's reasoning on claim 1.

89. The Board found that the rejection of claim 12 relies on Levy to satisfy the second wherein clause that the first and second arrangements cause the wallet to adopt a specific orientation on the mobile device. As the Board had already found in connection with claim 1, Levy's protuberances and recesses, not the magnets, cause the orientation of the electronic device in Levy's mount. The

Board found that this deficiency in the claim 1 analysis carries directly through to claim 12, since claim 12 contains the same second wherein clause requiring magnetic causation of specific orientation.

90. Critically, the Board found that while the Examiner changed its position to rely on Baca combined with Levy for the second wherein clause, the Examiner "fails to provide any reasoning as to how or why a person of ordinary skill in the art would have further modified the Berkley and Baca combination with the teachings of Levy to meet the second wherein clause." The Board found this failure of reasoning fatal to the rejection, noting that the Examiner's explanation was conclusory and did not articulate a specific rationale for why a PHOSITA would modify the Berkley and Baca combination with Levy's teachings in the manner required to arrive at claim 12's architecture. The Board accordingly reversed the rejection of claim 12 on the Berkley, Baca, and Levy ground.

91. After the Board's reversal, 1LSS amended the claims to include the ferromagnetic shield of claim 2 into independent claim 1, and rewrote claim 6 as an independent claim incorporating the other limitations of independent claim 1. EX1002, 463-65. The Examiner allowed the claims based on the Board's finding that the prior art did not disclose or render obvious the claims. *Id*., 528.

B. How Magnetic Stripes Work and How They Are Damaged

92. The magnetic stripe on a standard credit card or identification card is specified by ISO 7811, which defines the location, dimensions, magnetic properties, and encoding format of magnetic stripes on identification cards conforming to the ISO 7810 physical format. ISO 7811 is divided into multiple parts addressing different aspects of magnetic stripe technology, with ISO 7811-2 addressing low coercivity stripes and ISO 7811-6 addressing high coercivity stripes.

93. ISO 7811 specifies that the magnetic stripe is located on the reverse surface of the card, positioned within defined dimensional tolerances from the top edge of the card. The stripe generally runs the full width of the card, i.e., the entire 85.60 mm length of the ISO 7810 standard card, and contains three tracks of encoded data designated Track 1, Track 2, and Track 3 which is written to specific regions of the stripe. Track 1 and Track 2 are the tracks used by credit card payment systems. Track 1 encodes the cardholder’s name, account number, and expiration date in alphanumeric format, while Track 2 encodes the account number and expiration date in numeric format. The stripe's position on the reverse surface of the card means that the entire stripe is exposed to any magnetic field that reaches the reverse surface of the card from any direction, with no natural geometric shielding provided by the card's own structure.

94. The image below is from ISO 7811-2 showing an example of how Track 1 will look on a portion of the back of the card and what the bit density is for each of the tracks. Track 1 uses a 7 bit alphanumeric coded character set and track 2 uses a 5 bit numeric coded character set which is the same for both low and high coercivity cards.

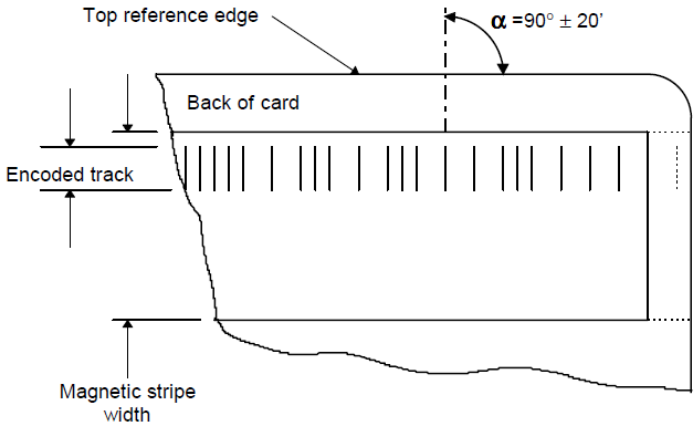


Figure 9 — Angle of recording

9.2 Nominal bit density

The nominal bit density for each of the tracks shall be:

for track 1	8,27 bits/mm (210 bpi),
for track 2	2,95 bits/mm (75 bpi),
for track 3	8,27 bits/mm (210 bpi).

95. ISO 7811 specifies the coercivity of the magnetic stripe material, which is the measure of the magnetic field strength required to reduce the magnetization of the stripe material to zero, reversing its encoded orientation. ISO 7811-2 specifies low coercivity stripes at approximately 300 Oersteds, while ISO 7811-6 specifies high coercivity stripes at approximately 2750 Oersteds. Most

modern credit cards issued by major payment networks use high coercivity stripes under ISO 7811-6, which require a stronger external field to corrupt than the low coercivity format. However, as discussed below, the coercivity specification establishes the field strength required to completely demagnetize the stripe, not the threshold below which no damage occurs, and meaningful data corruption can occur at field strengths below the full coercivity value under practical exposure conditions. Indeed, Dr. Phinney admitted that "degradation or demagnetization doesn't just involve that type of coercive force . . . it can occur at lower magnetizations especially DC magnetizations." EX2021, 42-43.

96. **Note**: Coercivity is the measure of a material's ability to withstand an external magnetic field without becoming demagnetized and has Oersted or Amp/Meter units. What is important to know is that if a magnetized material is exposed to an opposite field of equal strength, it will become demagnetized. What this means in practice is that if 300 Oersted magnets are exposed to a 300 gauss magnetic field of opposite polarity the magnets would become demagnetized.

97. Most Americans have, or use, both style cards. Every day millions of each style are used. The table below shows some examples of high and low

coercivity cards as stated by Advantidge 20, a secure ID solutions company. EX2011 ("What's the Difference Between HiCo & LoCo Blank ID Cards?").

High Coercivity Cards (2750-4000)	**Low Coercivity Cards (300)[2]**
Credit Cards	Hotel Room Cards
Bank Cards	Gift Cards
Access Control Cards	Transit Cards
Employee ID Cards	Theme Park Passes

98. The data encoded on a credit card magnetic stripe is stored as a spatial pattern of magnetic domains, which are discrete regions of the ferromagnetic stripe material in which the magnetic dipoles of the ferromagnetic particles are collectively oriented in a specific direction. This is a fancy way of saying that there is a long series of magnetic lines that are either North or South that are printed onto the card stripe. In the previous image there are a number of vertical lines that have been magnetized within the "encoded track", each of which is north or south.

99. During the card encoding process, the write head generates a magnetic field that permeates through the recording medium which is magnetized. By

[2] EX2015; EX2016

controlling the current in the coil of write element, the magnetic field can be altered according to the bit pattern to be recorded. EX2012 (“Analysis of the Formation of Magnetic Transition in Digital Magnetic Recording System”). The transitions between regions of opposite orientation represent binary data bits. For example, a transition from one orientation to the opposite represents a logical "1," while the absence of a transition represents a logical "0." The complete sequence of transitions across the full length of the stripe encodes the card's account data in the format specified by ISO 7811 for the relevant track. The image below is Figure 10 from ISO 7811-2 shows how each bit cell is read and if the output is a 1 or a 0. If there is a polarity change within a bit cell then a 1 bit is generated and if there is no polarity change within a bit cell then a 0 bit is generated. These binary bits are then read, along with a start and end sentinel to translate the bit sequence into an alphanumeric character set (derived from ASCII).

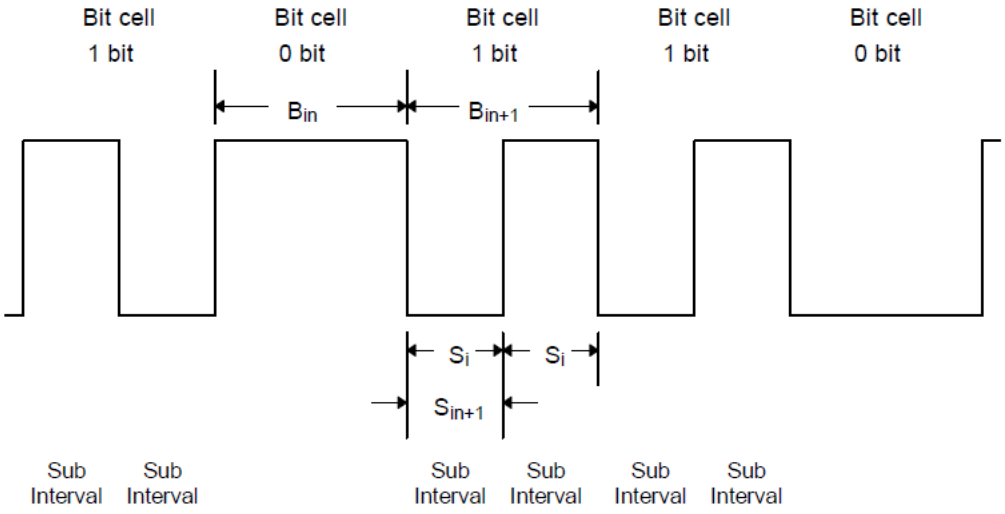


Figure 10 — Flux transition spacing variation

100. The physical density of the encoded data is defined by ISO 7811 in terms of bits per unit length along the stripe, i.e., the number of magnetic transitions per millimeter of stripe length. This encoding density means that the magnetic domains that represent individual data bits are extremely small, on the order of fractions of a millimeter in length, and the ferromagnetic particles within those domains have been precisely oriented during encoding to represent a specific bit value. The integrity of the encoded data depends entirely on the preservation of this precisely oriented pattern of magnetic domains across the full length of all three tracks of the stripe.

101. When a magnetic stripe is exposed to an external magnetic field of sufficient strength, that field exerts a torque on the magnetic dipoles of the

ferromagnetic particles within the stripe material, the same physical mechanism by which the encoding process originally oriented those particles. If the external field is strong enough, it reorients some or all of the ferromagnetic particles in the affected region of the stripe away from their encoded orientations and toward the direction of the external field. This reorientation disrupts the pattern of magnetic domain transitions that encodes the card's data by replacing the precisely encoded bit pattern with a new pattern determined by the geometry and strength of the external field rather than by the card encoding process.

102. The result is that the card reader, which detects the pattern of magnetic transitions as the card is swiped, reads a different pattern than was encoded during the card issuance process. Depending on the degree of reorientation, the card reader may detect incorrect data values, may detect no transitions at all in regions where the field has uniformly reoriented all particles, or may detect an incoherent mixture of correct and corrupted transitions. In any of these cases, the card reader's error detection and correction logic, which checks the encoded data against standard checksums and parity bits specified by ISO 7811, will detect an error condition and reject the card as unreadable. If any of the necessary data on the stripe is corrupted the card will not be usable. The best

analogy would be that if you have a password and you get all but one character correct when entering the password, it still won't work.

103. Critically, any exposure of any portion of the encoded track of a magnetic stripe to a corrupting magnetic field renders the entire stripe's encoded data unusable and the card non-functional. This is not a matter of degree — there is no partial corruption that leaves the card operational.

104. The reason for this is embedded in the encoding architecture of the magnetic stripe system as specified by ISO 7811. The encoded data on each track of the stripe is not stored as independent, redundant segments that can be partially read if some segments are corrupted. Rather, the data on each track forms a single continuous sequence of magnetic transitions that must be read correctly from beginning to end for the card reader to reconstruct the encoded account information. ISO 7811 specifies start sentinels, end sentinels, and longitudinal redundancy check characters at specific positions along each track. These are integrity-checking fields that bracket the encoded account data and allow the card reader to verify that the data has been read correctly. If any portion of the stripe between the start sentinel and the end sentinel has been corrupted, even a single bit transition, the card reader's error detection logic will flag the data as invalid and reject the card.

105. The practical consequence is binary: either the stripe has been exposed only to fields below the damage threshold across its entire length, in which case the encoded data is intact and the card functions normally, or the stripe has been exposed to a corrupting field across any portion of its length, in which case the encoded data is corrupted at that location and the card is non-functional, regardless of how much of the rest of the stripe remains intact. A credit card with a partially corrupted magnetic stripe is not a partially functional credit card. It is a non-functional credit card, because the payment system cannot reconstruct valid account data from a stripe with any corruption in the data field.

106. Because corruption of a portion of the magnetic stripe renders the entire card non-functional, a shielding arrangement that leaves any portion of the stripe exposed to a magnetic field exceeding the damage threshold provides zero net protection to the card's functionality — not reduced protection, not imperfect protection, but no protection at all from a functional standpoint.

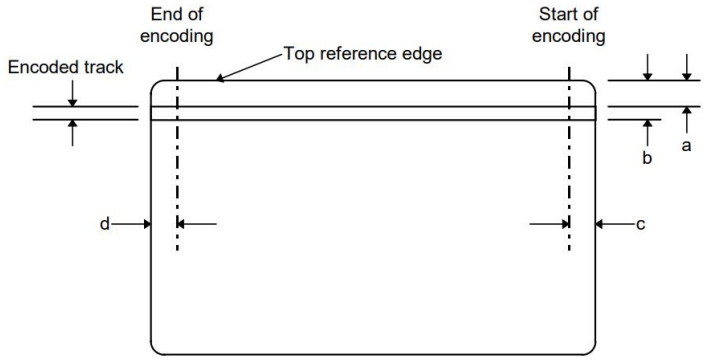
107. The image below is Figure 11 from ISO 7811-2 standard. It shows the actual position of data on a low coercivity card. The start of encoding, where the data actually starts on the stripe, is 7.44mm from the right edge of the card, which means that if more than 7.44mm of the card is exposed to a high enough

magnetic field, then the card will no longer be useable. Regardless of how well shielded a wallet is, if part of a encoded track sticks out of the shielded portion of the wallet and is exposed to a high enough magnetic field, then the card is no longer useable. The encoded data starts at about 7.5mm from the edge of the card which means that if more than 7.5mm of the card is NOT shielded, then the data in that portion of the stripe can be corrupted by a magnetic field.

ISO/IEC 7811-2: 2001(E)

12 Location of encoded tracks

Each encoded track shall be located between the two lines as shown in Figure 11. The start of encoding is located at the centreline of the first "one" bit in the start sentinel. The end of encoding is located at the centreline of the last bit in the longitudinal redundancy check character (the last bit is the parity bit).



dimensions in millimetres (inches)

Term	Track 1	Track 2	Track 3
a	5,79 (0.228) maximum	8,33 (0.328) minimum 9,09 (0.358) maximum	11,63 (0.458) minimum 12,65 (0.498) maximum
b	8,33 (0.328) minimum 9,09 (0.358) maximum	11,63 (0.458) minimum 12,65 (0.498) maximum	15,19 (0.598) minimum 15,82 (0.623) maximum
c	7,44 ± 1,00 (0.293 ± 0.039)	7,44 ± 0,50 (0.293 ± 0.020)	7,44 ± 1,00 (0.293 ± 0.039)
d	6,93 (0.252) minimum	6,93 (0.252) minimum	----

Note All tracks have a minimum width of 2,54 (0.100).

Figure 11 — Location of encoded tracks

108. The images below on the left is a folio made by Zover and the image on the right is a second folio style case that is made by Burkley. These cases are

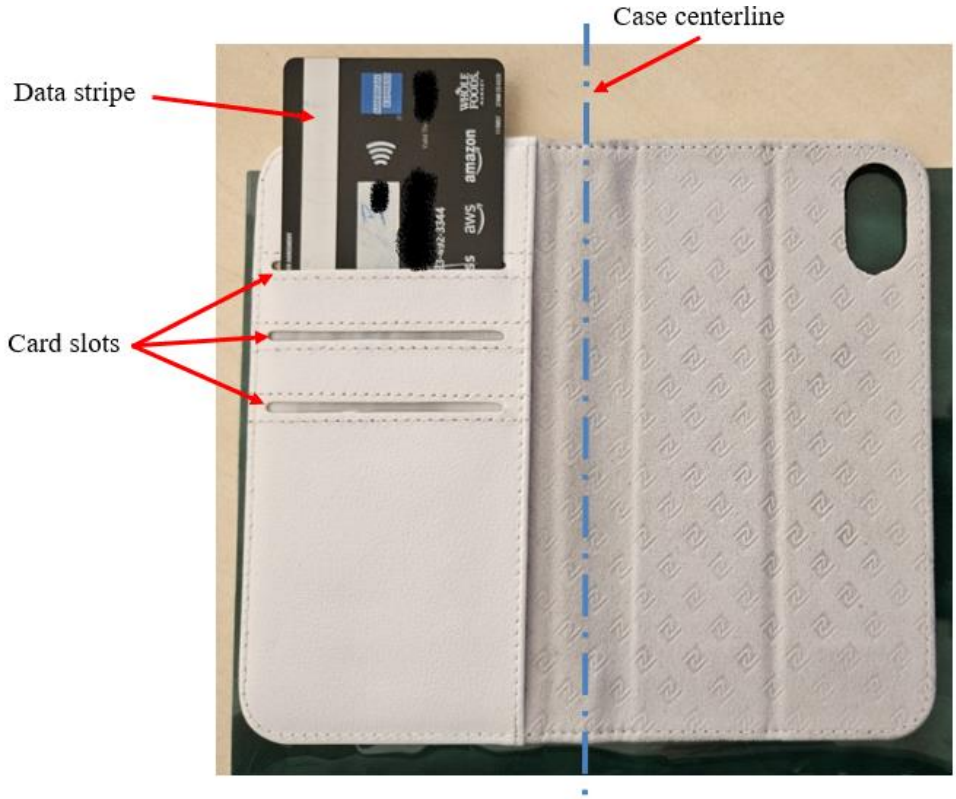
similar to Zhu and Kinshi respectively, (this will be shown and discussed later in this declaration).



109. In both instances the credit card shown was inserted as far as it would go into card slot and it is clear that in both instances part of the encoded track remains exposed. Folio style cases are designed so that a certain amount of the card remains exposed so that the cards can be easily viewed and removed when needed. The amount of the card that remains outside of the pocket is determined by the

specific manufacturer. What is clear is that both of these manufacturers decided that they needed to leave between 15mm and 22.5mm of the card exposed which means that the between 7.5mm and 15mm of the encoded tracks will be outside of the card slot thus exposing card stripe data to being damaged by the magnets in the folio style cases. This exposure to the magnets is shown in the next few paragraphs.

110. The two images below show the inside of the Zover folio style case. The first shows the inside and the second is the same view of the inside but with magnetic viewing paper over the top of it showing the size and location of the magnets that are in the case.



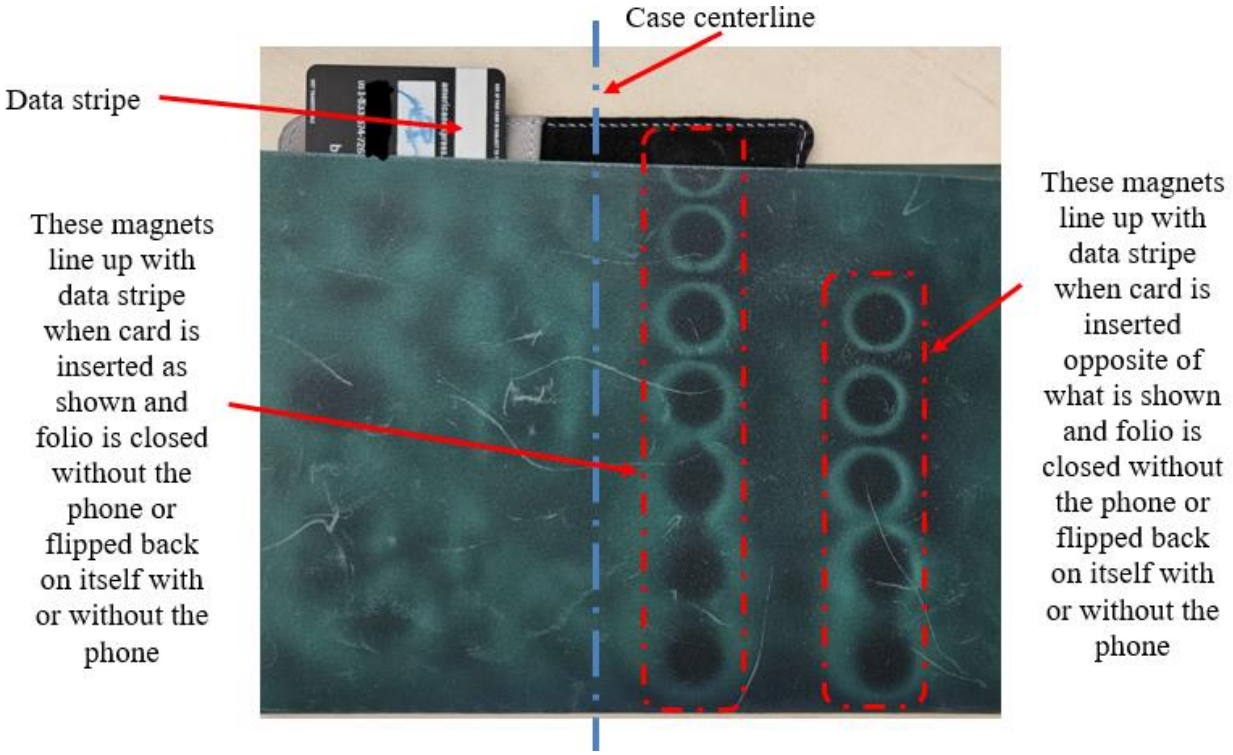
111. The magnetic imaging paper below shows the 13 rectangular magnets that are in the Zover case.

or without the

112. The two images below show the inside of the Burkley folio style case. The first shows the inside and the second is the same view of the inside but with magnetic viewing paper over the top of it showing the size and location of the magnets that are in the case.



113. The magnetic imaging paper below shows the 12 round magnets that are in the Burkley case.



C. How Ferromagnetic Shielding Works — And Its Prerequisites

114. The physical mechanism of ferromagnetic shielding is most precisely understood through the concept of magnetic reluctance, which is the magnetic analog of electrical resistance in a circuit. Just as electrical current flows preferentially through paths of low electrical resistance, magnetic flux — the flow of magnetic field lines — distributes itself preferentially through paths of low magnetic reluctance. The magnetic reluctance of a material is inversely proportional to its magnetic permeability, the measure of the material's ability to support the formation of a magnetic field within itself. Air and most non-magnetic materials

have very low magnetic permeability, approximately equal to the permeability of free space, and therefore very high magnetic reluctance. Ferromagnetic materials, such as iron, iron alloys, mu-metal, and similar materials, have magnetic permeability hundreds to hundreds of thousands of times greater than air, and correspondingly very low magnetic reluctance.

115. When a ferromagnetic shield is interposed between a magnetic field source and a protected object, the shield presents a path of dramatically lower reluctance than the air space behind it, that is, the space occupied by the protected object. Magnetic flux, following the path of least reluctance, preferentially flows through the ferromagnetic shield material rather than through the air space beyond it. The result is that the field lines that would otherwise pass through the protected space are instead redirected through the shield material, concentrating within the shield and emerging on the far side of the shield in a pattern determined by the shield's geometry. The field strength experienced by the protected object, on the far side of the shield from the field source, is correspondingly reduced, because fewer field lines pass through the protected space and more pass through the shield material. The degree of attenuation depends on the permeability of the shield

material, the thickness of the shield, and the completeness of the shield geometry relative to the geometry of the field source and the protected object.

116. One of the most important and frequently misunderstood aspects of ferromagnetic shielding is that the mechanism described above (flux redirection through the low-reluctance shield material) only works if the shield fully interposes between the field source and the protected object with no alternative air path or bypass route around the shield. This is not a minor technical qualification — it is a fundamental prerequisite for effective shielding that follows directly from the physics of magnetic flux distribution.

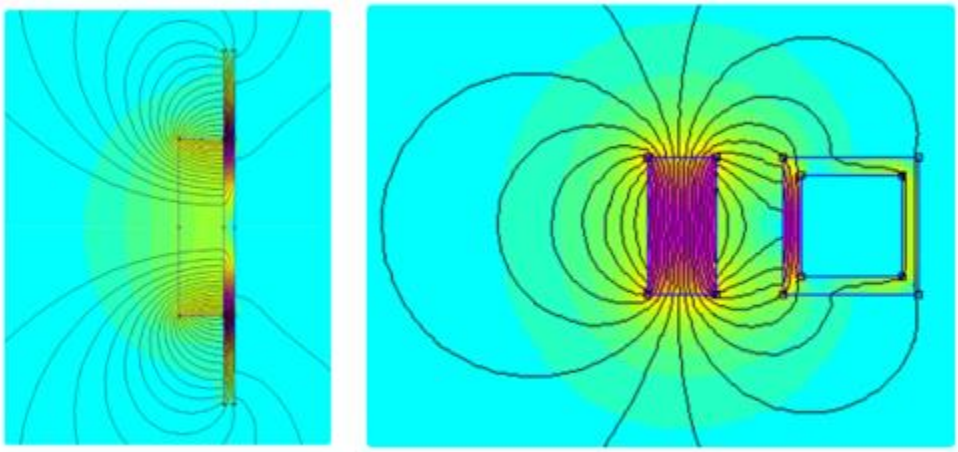
117. The reason is this: magnetic flux, like electrical current, distributes itself across all available paths in proportion to the conductance, which in magnetic terms, is the permeance, i.e., the inverse of reluctance, of each path. A ferromagnetic shield provides a very low-reluctance path through the shield material, which captures the majority of the flux. But if there is also an air path such as a gap, an exposed portion, or any bypass route through which flux can reach the protected object without passing through the shield material, then some flux will take that path. The fraction of total flux that takes the bypass path is determined by the relative reluctance of the bypass path compared to the shield path. For a small

gap or open portions that provides a short, direct air path from the field source to the protected object, the bypass path reluctance may be comparable to or lower than the reluctance of the longer path through the shield material, which results in substantial flux reaching the protected object, even if the shield material itself has very high permeability. EX2021, 69 (agreeing that magnetic flux can take many different paths). Dr. Phinney acknowledge that "even where permeable magnetic circuit is provided, there still can be leakage flux and other types of fringing fields, magnetic fields around the permeable pathway. And especially in the case where if you had two magnetic regions that are separated, generally speaking, between them, there will be a magnetic -- magnetic fields in really all the space around these that is taking up a path from one magnet to the other through space." EX2021, 71-72.

118. In practical terms, this means that a planar shield that does not completely cover the protected object cannot redirect field lines that reach the target via paths circumventing the shield. A ferromagnetic sheet or foil that covers one face of the protected object but leaves the top, bottom, or sides open will redirect field lines that approach directly through the covered face, but will provide no redirection of field lines that approach via the uncovered open top. Field lines from a source above a planar shield can arc around the shield and reach the protected

object without ever passing through the shield material, experiencing the full field strength of the source with no attenuation from the shield. This is basic magnetic circuit theory that a shield that does not fully enclose the flux path between the source and the protected object cannot fully redirect the flux, regardless of how permeable or how thick the shield material is. EX2021, 71-72.

119. The images below from K&J Magnetics show this. The image on the left shows how the field lines emanating from the magnet are shunted through the material; however, field lines at the edges of the material are not shielded. This is especially true when the magnets are closer to the edges of the shield. The image on the right shows how the field lines warp around a fully enclosed "compartment". Most of the field lines are shunted through the side of the encloser nearest the magnet and the field lines that would have normally wrapped around that side, like the example on the left, are shunted through the rest of the enclosure. EX2017.



120. As a result, the only shielding arrangement that guarantees no bypass path between the field source and the protected object, (assuming the shield has not reached its saturation point, explained below), is one that fully encloses the protected object, or fully interposes between the field source and the protected object, on all sides from which the field can approach, leaving no open edge, no gap, and no air path through which flux can circumvent the shield material. In a fully enclosed geometry, every path from the field source to the protected object passes through the ferromagnetic shield material, ensuring that all flux is subjected to the low-reluctance redirection mechanism described above. In contrast, a planar shield that leaves the protected object with an exposed portion cannot redirect field lines that reach the target via paths circumventing the shield. The exposed portion

is a bypass path that the shielding cannot address, regardless of how thick or how permeable the shielding material in the walls is made.

121. Another aspect of magnetic shielding that is often overlooked is saturation. Regardless of how well an object has been shielded, if the shielding reaches a saturation point its shielding effectiveness drops significantly because the material can no longer guide magnetic flux, causing it to act like air (permeability approaches unity) and allowing the magnetic field to pass through. This leads to catastrophic shield failure, where magnetic lines of force pass directly through the material instead of being redirected, drastically reducing shielding efficiency. Different materials have different magnetic saturation points. For example, soft iron has a higher magnetic saturation point, while permalloy and Mu-metal have a higher permeability but a relatively lower magnetic saturation point. EX2013 ("How to shield the magnetic field of permanent magnets").

122. This is one of the issues that has to be considered when specifying magnets. A thin layer, or layers, of shielding material that could be incorporated into a folio style case may do a fairly good job of shielding weak magnets or at least significantly lowering the magnetic field enough to be able to safely store data stripe cards. However, that same shielding will immediately become saturated when

exposed to high-power neodymium magnets and fail at shielding enough of the magnetic field to stop the data from being corrupted on the card.

123. When choosing a shielding material there are tradeoffs between permeability, saturation, and cost that must be considered. The chart below, from Magnetic Shielding Handbook Westinghouse, shows some of the more common shielding materials available and their permeability and saturation levels.

TABLE B
COMPARISON OF MAGNETIC SHIELDING MATERIALS
(d-c values at .020" thickness)

	Saturation	Permeability		Ultimate Shielding Efficiency	
Material	(gauss)	μ max	μ 40	Ho/Hin	db
80% nickel, balance iron (Westinghouse HIPERNOM®)	8,000	400,000	45,000	100×10^3	100
50% nickel, balance iron (Westinghouse HIPERNIK®)	15,000	75,000	10,000	19×10^3	85
Silicon Steel (3% Si-Fe)	20,000	5,000	3,000	1.3×10^3	62
1010 Carbon Steel	22,000	3,000	1,000	$.75 \times 10^3$	58

124. From an economic standpoint shielding material choice is crucial. "Generally speaking, the costs of magnetic materials rise with their permeabilities. For this reason, the designer should choose the lowest permeability material that will provide the required attenuation. It may be, though, that a thin shield of higher permeability material is cheaper after fabrication than a thicker shield of less-expensive, lower-permeability metal. These trade offs must be remembered in

design." EX2018 [Magnetic Shielding Handbook Westinghouse] at 9. High permeability materials are very expensive which precludes using multiple layers to reach an acceptable saturation level, and lower permeability materials that have higher saturation levels are prone to oxidation, rust, because of the high iron content. Even 430 stainless steel, which is one of the few stainless steels that can be used for shielding, will rust because it's a ferritic steel with a low nickel content.

125. The oxidation issue is a substantial issue for any product such as the folio style phone cases. Getting caught in the rain with a the phone in your pocket or simply wearing your phone on the inside of a winter jacket will result in the case being exposed to 100% humidity, which for high iron content materials, result in the material rusting. Once iron rusts it is generally not magnetic, which means it no longer acts a shield.

D. Mechanical Alignment Systems

a. Overview

126. By December 2017, the use of mechanical alignment systems for use in mounting personal electronic devices such as smartphones that permit the device to be mounted in a specific orientation were well known. For example, U.S. Patent Application Publication No. 2019/0198212 to Marc Levy (hereinafter "Levy"), titled "Personal Electronic Device Case and Mounting System," discloses a

mounting assembly for a personal electronic device comprising a case and a mounting structure that are releasably and securely couplable to one another in one or more selected orientations. EX2010, [0032]. Levy's mounting system is designed to allow a user to quickly and securely attach a smartphone or other personal electronic device, received within a specially designed case, to any of a variety of mounts, including desk mounts, vehicle mounts, arm straps, handlebar mounts, clip mounts, and hand strap mounts. *Id*., [0032], [0050], [0051], [0052], [0053], [0054]. Like Berkley, Levy is directed to a consumer accessory for a handheld personal electronic device. Levy's disclosure is therefore directly relevant to the field of portable, hand-carried personal electronic device accessories, and a person of ordinary skill in the art seeking to improve the attachment of Berkley's wallet to a smartphone would look to Levy as a reference within the same field of endeavor.

b. Levy's Mechanical Alignment System — The Protrusion and Recess

127. The central and defining feature of Levy's mounting system is a mechanical alignment interface comprising a shaped protrusion on the mount and a complementary shaped recess on the device case. That is, a male/female keying arrangement that physically constrains the relative position and orientation of the case on the mount. *Id*., [0032], [0037]. Levy's specification describes this interface

as follows: "[t]o ensure that the case 104 remains properly oriented relative to the mount 106 and is restrained from moving when the case 104 is coupled to the mount 106, …the mount 106 includes a shaped protrusion 112 formed on the receiving surface 109 . . . and the case 104 includes a similarly shaped recess 114." *Id*., [0037]. The protrusion extends away from the receiving surface of the mount and is configured to be securely received within the recess formed in the rear surface of the case when the case is coupled to the mount. The recess and protrusion are "sized and shaped such that the protrusion 112 fits snugly within the recess 114, thereby limiting any translational movement of the case 104 relative to the mount 106." *Id*.

128. To control rotational orientation in addition to translational position, Levy's protrusion incorporates a plurality of alignment and “anti-rotation tabs” spaced around its perimeter, and Levy's recess incorporates a corresponding plurality of cut-outs spaced around its perimeter to receive the tabs. *Id*., [0038]. Levy states: "the protrusion 112 has a generally circular shape and a plurality of alignment and anti-rotation tabs 118 spaced around the perimeter of protrusion 112" and "the recess 114 has a generally circular shape and a plurality of cut-outs 116 . . . spaced around the perimeter of the recess 114 so as to receive the tabs of the

protrusion 112 when the protrusion 112 is mated in the recess 114." When the case is engaged with the mount and the tabs are seated within the cut-outs, "the ability of the protrusion 112 to rotate within the recess 114" is limited, "thereby restricting the undesired rotation of the case 104 relative to the mount 106." *Id*. The result is a mechanical coupling that constrains the case in all degrees of freedom. Translational movement in all lateral directions is prevented by the snug fit of protrusion in recess, and rotational movement is prevented by the tabs seated in the cut-outs. *Id*., [0037], [0038].

c. Levy's Magnets Provide Attachment Force Only — Mechanical Features Control Orientation

129. This is the most analytically significant aspect of Levy's disclosure for the present proceeding: in Levy's mounting system, the magnets provide pull-off resistance, *i.e.,* the force that holds the case against the mount face, while the mechanical protrusion-and-recess system provides all orientation control and shear resistance. These two functions are separated into two distinct structural elements, and Levy's specification makes this division of function explicit.

130. Levy discloses that the case includes "a plurality of case magnets 120a-d disposed in the inner surface 126 and arranged adjacent to and radially outward of the recess 114" and that the mount correspondingly includes "a plurality

of mount magnets 122a-d disposed in the receiving surface 109 and arranged adjacent to and radially outward of the protrusion 112." *Id*., [0039]. When the case is coupled to the mount with the protrusion seated in the recess, "each of the four case magnets 120a-d is adjacent to one of the corresponding one of the four mount magnets 122a-d" and "the case magnets 120a-d and mount magnets 122a-d act together to provide a compressive force between the case 104 and the mount 106." *Id*., [0039], [0040]. In other words, those skilled in the art would recognize that Levy's magnets provide compressive, that is, pull-off resistance force. They do not provide orientation control, neither rotational nor longitudinal.

131. The Board reached the same conclusion regarding Levy's mechanical features being responsible for the orientation control while the magnets provide attachment functionality. The Board examined Levy's disclosure in detail and concluded: "Based on the foregoing disclosure in Levy, we find that Levy's protuberances and recesses, not the magnets, cause the orientation of the electronic device in mount 106." EX1002, 443. This finding led the Board to reverse the Examiner's rejection of claim 12 based on Berkley and Levy, because the claim 1 limitation that the magnetic arrangements *cause* the wallet to adopt a specific

orientation was not satisfied by a combination in which mechanical features, not magnets, cause the orientation. *Id*., 459.

d. Levy Achieves Specific Orientation at Lower Magnetic Field Requirements Than Baca

132. Because Levy's mechanical protrusion-and-recess system bears responsibility for orientation control and shear resistance, Levy's magnets need only provide pull-off resistance, the force required to hold the case face against the mount face and to resist inadvertent separation during normal use. The primary force that must be overcome to hold the case face against the mount face is gravity, which acts as a shear force, in the vertical direction, and that force is resisted by the interface of the protrusion and the recess. Therefore, the magnetic force needed to keep the case on the mount is a substantially lower force requirement than what is required in Baca's system, in which the magnets must provide not only pull-off resistance but also the self-alignment force needed to snap the device into the correct orientation against misalignment forces, and must maintain that orientation against vehicular vibration and gravity in dashboard mounting applications. EX1006, [0079], [0080].

133. As such, unlike Baca, Levy does not specify a magnet grade, does not require rare earth magnets, and does not specify a minimum field strength for the

case magnets or mount magnets. *Id*., [0039]-[0045]. Levy describes the case magnets simply as "disk-shaped permanent magnets having fixed north and south poles" [0040] — a description consistent with common, inexpensive permanent magnets of any grade, including low-cost ferrite magnets of the type that would not approach the magnetic stripe damage threshold at the distances involved in a wallet-on-phone application. In some embodiments, Levy notes that mounts made from ferrous-based material do not require mount magnets at all, that is the case magnets alone attract to the ferrous mount surface. *Id*., [0055]. This further confirms that Levy's magnetic requirements are modest, a simple ferrous surface suffices in some embodiments, and that the system's performance does not depend on the high field strengths that Baca's rare earth arrays produce.

134. As explained below, this characteristic of Levy's system, achieving reliable, orientation-controlled attachment using mechanical features and magnets only for attachment purposes, stands in direct contrast to Baca's system, which requires N48 minimum neodymium magnets to function as described. EX1006, [0080]. For a PHOSITA seeking to add orientation control and secure attachment to Berkley's credit card wallet without introducing the card corruption risk that Baca's strong, rare earth magnetic arrays create, Levy's approach is the obvious choice

because it achieves orientation control through mechanical means that require no increase in magnetic field strength beyond what a simple, low-grade magnet provides.

e. Levy's Mechanical Alignment System is Virtually Free

135. A PHOSITA understands that the system put forth by Levy is as close to something for nothing as it gets. Unlike magnets, of any kind, Levy's mechanical protrusion-and-recess system increases manufacturing cost by a few pennies or less in volume. The only cost associated with this system is a minor increases to the original mold cost. Both the protrusion and recess geometry taught by Levy is burned into the mold that these parts are made from and adds almost nothing to the mold cost. The way it works is that graphite core is made for the protrusion and for the core and these are used to EDM, burn, the geometry into each of the mold cavities. So, the small cost of making the cores is then spread out over all of the parts that are ever made from that mold, and a PHOSITA would know this.

f. Summary

136. In summary, Levy discloses a personal electronic device mounting system that achieves secure, orientation-controlled attachment of a smartphone case to a variety of mounts through a mechanical protrusion-and-recess keying system, with simple disk-shaped permanent magnets providing compressive pull-off force.

Id., [0032], [0037], [0038]-[0040]. Levy's magnets provide attachment force only — orientation control and movement between the case and the mount is entirely the function of the mechanical tabs and cut-outs, as confirmed by the Board's finding in prosecution that "Levy's protuberances and recesses, not the magnets, cause the orientation of the electronic device." Levy specifies no magnet grade, requires no rare earth magnets, and discloses no alternating polarity arrays or spaced magnetic arrangements for orientation enforcement. Levy is compatible with Berkley's wallet application in field of use, attachment philosophy, and interface architecture, and a PHOSITA seeking to add orientation control to Berkley's wallet would look to Levy's mechanical alignment approach as the obvious solution that avoids the known risk of credit card corruption and cost burden that Baca's rare earth magnetic arrays create. However, while the Berkley and Levy combination provides adequate attachment and orientation control for a wallet-on-phone application, it does not satisfy claim 1's requirement that the magnetic arrangements themselves cause the specific orientation, as the Board confirmed in reversing the Berkley and Levy rejection in prosecution, and therefore does not lead a PHOSITA to the claimed invention’s magnetic array-based orientation features.

IV. PETITIONER'S CITED PRIOR ART

A. Berkley's Wallet (U.S. Publication No. 2017/0354229)

a. Overview

137. U.S. Patent Application Publication No. 2017/0354229 to Aymie Berkley and Lynn Goodman (hereinafter "Berkley"), titled "Cosmetic Wallet Compact," discloses a combined cosmetic compact and wallet accessory designed to attach to the back of a handheld device such as a smartphone. Berkley is explicitly and fundamentally directed to a device (cosmetic wallet) for carrying credit cards, identification cards, and cash as well as makeup— this is not an incidental feature of Berkley's disclosure but its primary purpose and the central design constraint around which every other feature of the device is organized.

b. Berkley is Intended to Hold Magnetic (Credit) Cards

138. As shown below, Berkley discloses a "cosmetic wallet compact that accommodates credit cards, identification cards and cosmetics for effective and easy access by users." EX1013, [0002]; *see also* [0006] ("object of the present invention is to provide a cosmetic wallet compact with a first casing into which a user may easily insert and retain credit cards, identification cards and cash, and a second casing to accommodate color cosmetics and a mirror panel."). As shown below, "[a]t the forward end 14 of the compact 10 is a receiving slot 16 through

which cards, such as credit cards, identification cards, business cards and the like, are inserted into the interior of the first casing 12. For example, when a credit card C1 is inserted into an empty first casing 12, it passes through the receiving slot 16 into the interior of the first casing 12. As credit card C1 is completely inserted into the interior of the first casing 12, it becomes visible through a dual function window 18, as shown in FIG. 1 and FIG. 2." *Id*., [0020].

139. Berkley discloses that its wallet "is adapted and sized to accommodate a combination of at least two to four credit card(s), identification card(s), and one or more folded paper bills. Thus, since the dimensions of a standard credit card are 3.370 inches in length by 2.125 inches in width by 0.0300 inches in height (or thickness), the interior of the first casing should be sized to accommodate at least two to four of such cards." *Id*., [0023].

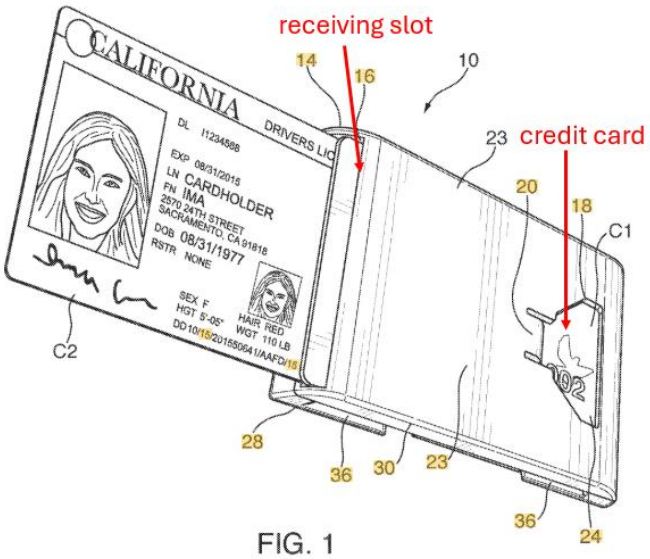


FIG. 1

c. Berkley Discloses the Use of a Magnet to Attach the Wallet to the Smartphone

140. The wallet is attached to a handheld device using a hook and loop fastener strips, a magnet, or other fixation means such as "microsuction tape or strong hold adhesive tape, such as those marketed by 3M, may be utilized to secure the base of improved compact to a smartphone." EX1013, FIG. 6 (annotated below), Abstract, [0027]-[0029].

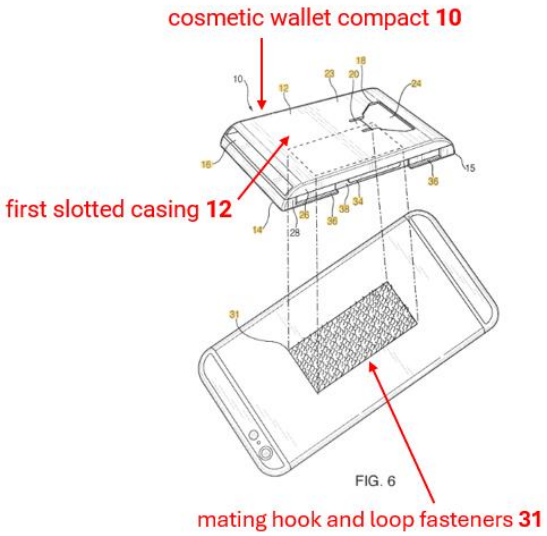


FIG. 6

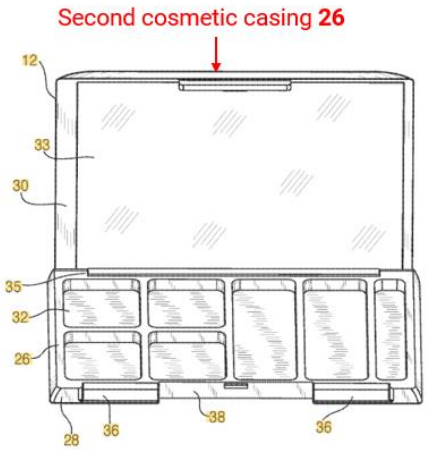


FIG. 7

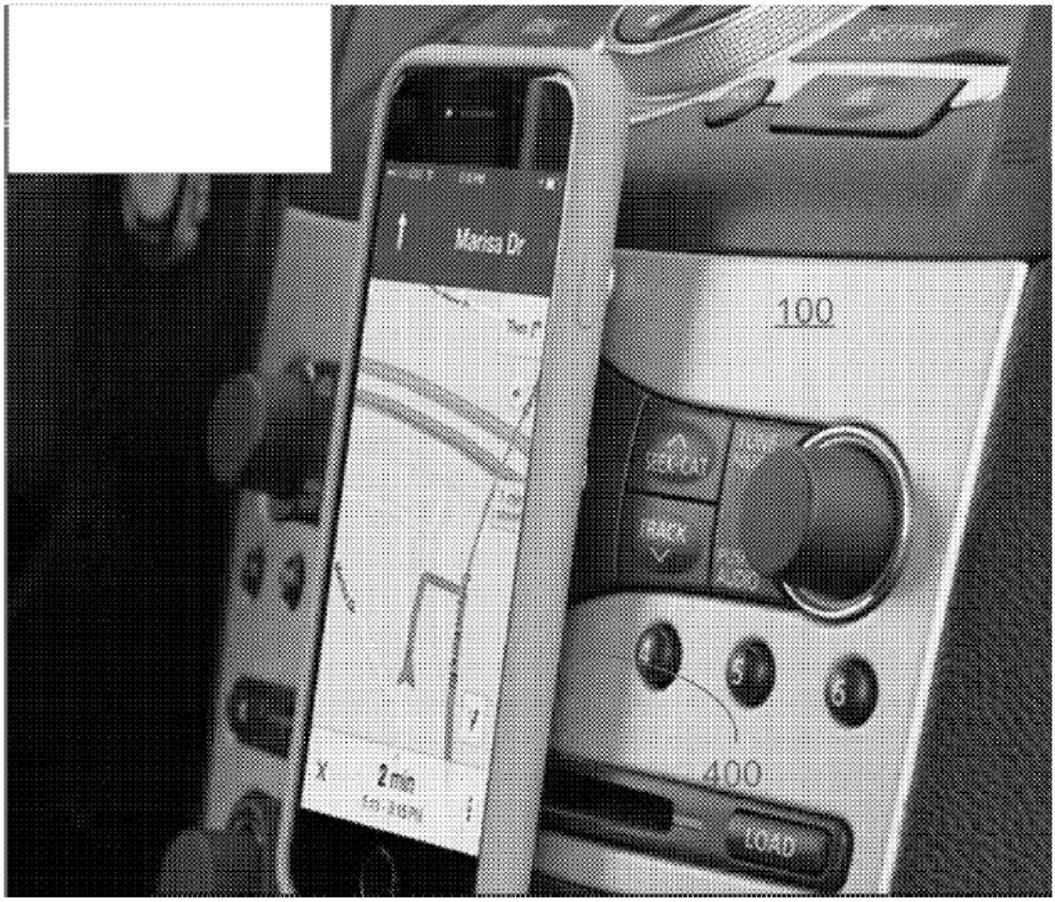
141. Berkley discloses that when the "fixation means comprises a magnet [it] is placed on the base of the device which enables the entire improved compact to 'stick' to a set of corresponding magnets that are attached by a user to a smartphone." *Id*. Berkley does not disclose that its magnet has alternating polarity arrays, self-alignment function, or results in a specific orientation of the wallet to the phone.

B. Baca's Rare Earth Magnetic Arrays (U.S. Publication No. 2016/0260532)

a. Overview

142. U.S. Patent Application Publication No. 2016/0260532 to Alejandro Baca (hereinafter "Baca") is titled "Self-Aligning, Multi-Surface Magnetic Mount for Electronic Display Devices" and discloses a mounting system for mounting

electronic display devices to various surfaces. Baca is explicitly and exclusively directed to the problem of mounting electronic display devices, including smartphones, tablet computers, televisions, and LCD displays, to stationary or semi-stationary surfaces such as automobile dashboards, walls, computer monitor bezels, and similar structures. EX1006, [0004], [0076]. Baca describes the surface to which the mounting system attaches as "any solid surface including nonmagnetic surfaces and nonferrous surfaces" and provides specific examples including "polymer, wood, glass, metal and combinations thereof," illustrating the system's use on an automobile dashboard in Figure 16 (shown below) and on a variety of surfaces in Figure 17 including wood, fabric, glass, painted wall, leather, and aluminum. *Id*., [0071], FIGS. 16 and 17.



143. Baca further describes a specific embodiment in which "the surface-side attachment 110 is affixed to the dash of an automobile using double-sided adhesive tape" and another in which "the surface-side attachment 110 is affixed to the bezel of a computer monitor using double-sided adhesive tape." *Id*., [0070]. The entire context of Baca's disclosure is stationary or vehicular surface mounting, i.e., holding a phone in place on a dashboard while driving, hanging a display on a wall, or positioning a device at a workstation.

b. Baca Does Not Disclose a Wallet

144. Baca contains no disclosure of a wallet, card holder, or any accessory designed to carry credit cards, identification cards, cash, or similar items. The word "wallet" does not appear anywhere in Baca's specification or claims. There is no disclosure of any compartment for storing personal items, no card slot, no content removal feature, and no design consideration related to the storage or protection of credit cards or other card-format contents.

145. Baca's mounting system is designed to attach a smartphone or other electronic display device to a fixed or semi-fixed surface — a dashboard, a wall, a monitor bezel. *Id*., [0003, 0070]. Baca does not disclose, suggest, or contemplate a magnetic accessory that attaches to the back of a smartphone and is carried with the phone throughout the day in a pocket, purse, or hand. The use case Baca addresses, mounting a device to a surface for hands-free viewing, is categorically different from the use case the ‘641 Patent addresses, carrying a wallet with a phone as a combined portable daily-carry item. In Baca's system, the phone is the object being mounted [0062, 0076]; in the '641's system, the wallet is the accessory being attached to the phone. These are different problems with different engineering requirements and different design constraints.

146. Baca's device-side attachment is affixed to the phone and couples to a surface-side attachment that is fixed to a wall or dashboard. Id., FIG. 16. Baca does not disclose a configuration in which two distinct magnetic arrangements are located on a single portable accessory, analogous to the wallet of the '641 Patent, that couples face-to-face with the back of a handheld smartphone for portable daily carry. Baca's paragraph [0064], on which the Examiner relied in prosecution to support the dual arrangement limitation, discloses the use of multiple surface-side attachments — fixed to walls, dashboards, or other surfaces — but used separately to couple to a single device-side attachment. This is distinct relative to the claimed wallet, which has two arrangements on the wallet side coupling to complementary arrangements on the phone side.

c. Baca's Magnetic Mounting System

147. Baca's mounting system comprises two components: a device-side attachment coupled to the electronic display device, and a surface-side attachment affixed to the mounting surface. *Id*., [0006]-[0007]. The device-side attachment contains a first plurality of magnets disposed in or on a protective cover for the electronic display device or directly coupled to the device. *Id*., [0006], [0062], [0073], [0076]. The surface-side attachment contains a second plurality of magnets and is configured to attach to the surface via adhesive, double-sided tape, or

mechanical fastener. *Id*., [0007], [0069], [0070]. When the device-side attachment is brought into proximity with the surface-side attachment, the magnetic attractive and repulsive forces between the two sets of magnets draw the attachments together and hold the device in place on the surface. *Id*., [0079], [0083].

148. In Baca's primary disclosed embodiments, the device-side attachment incorporates multiple arrays of magnets, embedded in the perimeter of a protective case for the electronic display device to allow the device to be hung in either a portrait or landscape orientation [0072], while the surface-side attachment comprises a single array of magnets housed in a surface-side attachment housing. *Id*., [0068]- [0069]. Figures 2A through 2D illustrate the device-side attachments embedded in the interior of a protective case, showing configurations with a single linear row or double linear rows of five magnets each. *Id*., [0072]; FIG. 2C (shown below).

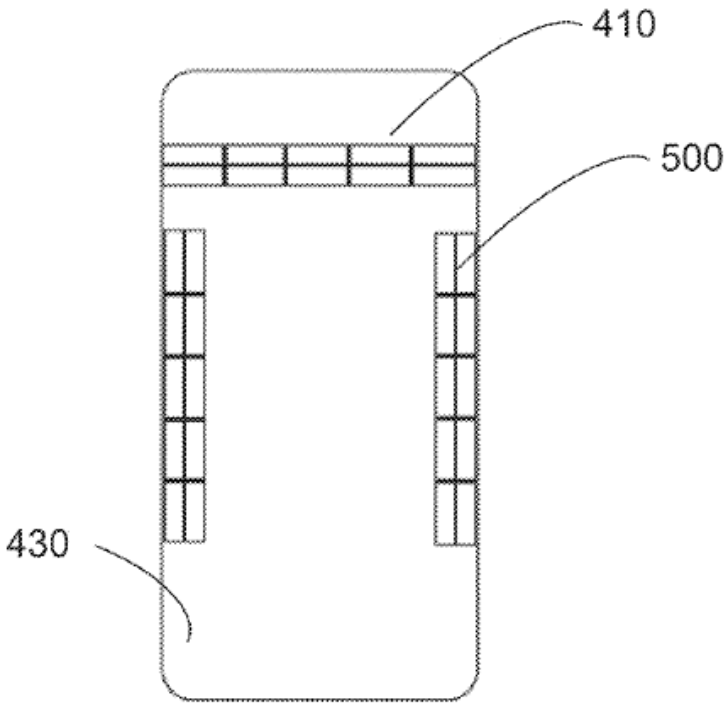


FIG. 2C

149. Figures 1A through 1F illustrate the surface-side attachment housing containing a single array of magnets in various configurations. *Id*., [0068]; FIG. 1F (shown below).

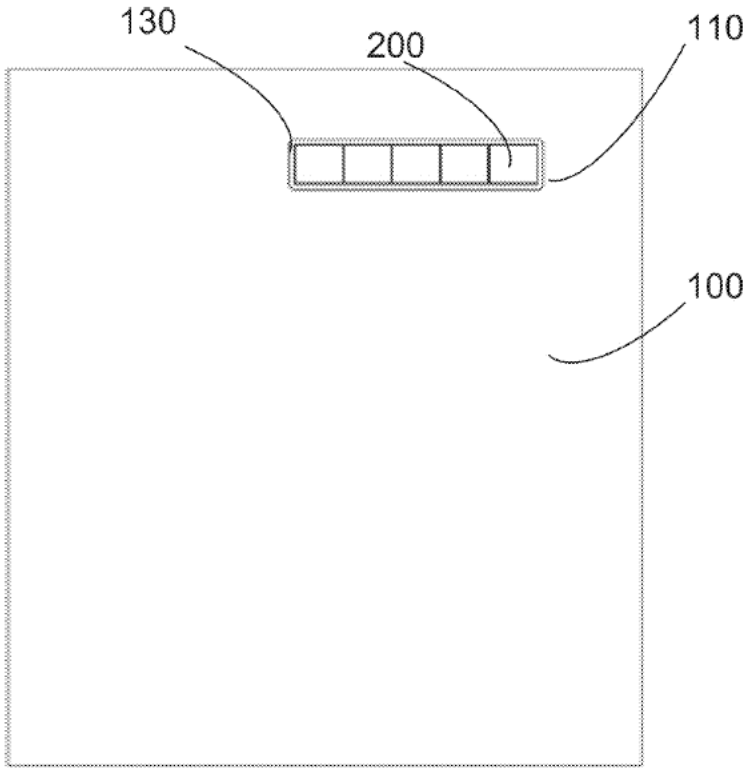


FIG. 1F

150. This arrangement, multiple device-side arrays enabling multi-orientation mounting to a single surface-side array, is the basis on which the Examiner argued that Baca teaches multiple magnetic arrays. As noted above, however, this architecture places the multiple arrays on the phone-side component, not on a separate portable accessory analogous to the claimed wallet.

151. Baca's magnets within each array are arranged in an alternating polarity pattern with outwardly-facing north poles and outwardly-facing south poles

arranged in a predetermined sequence within each array. Baca explains that "every magnet has a south pole and a north pole axially situated across opposite faces of the magnet" and that "the device-side attachment 410 and the surface-side attachment 110 each include at least one magnet with an outwardly-facing north pole, and at least one magnet with an outwardly-facing south pole." *Id*., [0081]. Figures 4A through 4I depict examples of self-aligning arrangements of outwardly-facing magnet poles for use in device-side and surface-side attachments, showing both symmetrical arrangements, which allow mounting in two positions 180 degrees apart, and asymmetrical arrangements, which allow mounting in only one position. *Id*., [0084]. This alternating polarity arrangement is what produces Baca's self-alignment function, as described below. *Id*., [0083].

152. Baca's self-alignment function arises from the interaction of the alternating polarity patterns in the device-side and surface-side attachments. *Id*., [0082], [0083]. When the device-side attachment is placed in proximity to the surface-side attachment, the magnetic forces of attraction between complementary poles, north attracted to south, and repulsion between like poles, north repelling north, guide the attachments into the correct relative position. *Id*., [¶0081], [0083]. If the device-side attachment is misaligned relative to the surface-side attachment

during mounting, the repulsive forces between like poles push the attachments away from the misaligned position and the attractive forces between complementary poles draw them toward the aligned position. *Id*., [0083]. The result is that the device self-aligns with the surface-side attachment when brought into proximity, snapping into the correct position without requiring precise manual alignment by the user. *Id*., [0008], [0083] ("The magnetic forces of attraction and repulsion, along with the predetermined arrangement of the outwardly-facing poles of the magnets within each attachment, provide for self-alignment of the coupled attachments.").

d. Baca's Use of Rare Earth Magnets — N48 and N52 Neodymium

153. Baca's mounting system is specifically designed around the use of rare earth permanent magnets, and Baca's specification treats the use of high-grade rare earth magnets not as a preferred option but as a requirement for the system's performance. *See also* EX2021, 34-35 (Dr. Phinney agreeing that Baca expressly discloses only rare earth magnets of N48 as minimum and N52 as more preferred and relying only on those magnet embodiments). Baca states: "Magnets 200 and magnets 500 are preferably made out of rare earth metals including alloys of neodymium or samarium-cobalt. Rare earth magnets are selected based on their strongly magnetic properties that include a higher maximum energy product

(related to magnetic flux per unit volume) than other types of magnets including ferrite and alnico magnets. Neodymium magnets of grade N48 and higher are preferred, and neodymium magnets of grade N52 and higher are more preferred." *Id*., [0080].

154. This specification of grade N48 as a minimum and grade N52 as preferred is not incidental to Baca's disclosure but rather reflects the engineering reality that Baca's mounting system must hold an electronic display device, e.g., a smartphone or tablet weighing hundreds of grams, against gravity and vehicular vibration forces on a dashboard or wall. *Id*., [0003], [0004], [0079]. The attractive and repulsive forces required to self-align and hold a loaded device in that context require the high maximum energy product and remanence that only rare earth magnets of grade N48 or higher reliably provide. *Id*., [0080].

155. Baca’s taught an electronic display mounting system for the dashboard of a vehicle which is why N48 – N52 magnets are specifically mentioned. When a display device such as a phone is mounted onto a dash it will experience a force equal to twice its weight when driving over highway rumble strips or lane reflectors, and will experience much greater forces, three times or more, when hitting a pothole. This means that the magnetic pull force on Baca’s

mounting system had to be at least six times the weight of the display device being held.

156. **Note**: If magnets are used to hold an object onto a vertical surface then the shear force, the vertical shear force resisting gravity, between the magnets must be at least equal to the weight of the object as magnets generally provide a shear force of just over half the pull force. EX2019. This means that a 10 oz object would need a 20 oz pull force magnet to hold it. If this same object saw a 2G dynamic acceleration, not uncommon in motor vehicles, then it would act as a stationary object 3 times heavier thus needing magnetic pull force of six times its weight to remain attached to the vertical surface, hence the reasoning behind Baca's teachings.

157. These rare earth magnets of grade N48 and higher are among the strongest commercially available permanent magnets, producing surface magnetic fields of approximately 4,000 to 6,500 Gauss and maintaining substantial field strengths at distances relevant to a wallet-on-phone configuration. As discussed above (Section III.B) in greater detail, these field strengths substantially exceed the threshold at which magnetic stripe credit cards experience data corruption, a consequence directly relevant to a PHOSITA's assessment of whether Baca's

specific magnetic teaching is suitable for combination with Berkley's credit card wallet. *Id*., [0080].

e. Baca's Acknowledgment of Cost Concerns and Ferrous Insert Teaching

158. Baca's own specification explicitly acknowledges that rare earth magnets are expensive and teaches that their use should be minimized where possible through the substitution of ferrous inserts. EX2021, 34-35 (agreeing that rare earth magnets are "often more expensive").

159. Baca states that "[f]errous inserts can also be used in surface-side attachments 110 to reduce product costs. Rare earth magnets 200 tend to be expensive." *Id*., [0085].

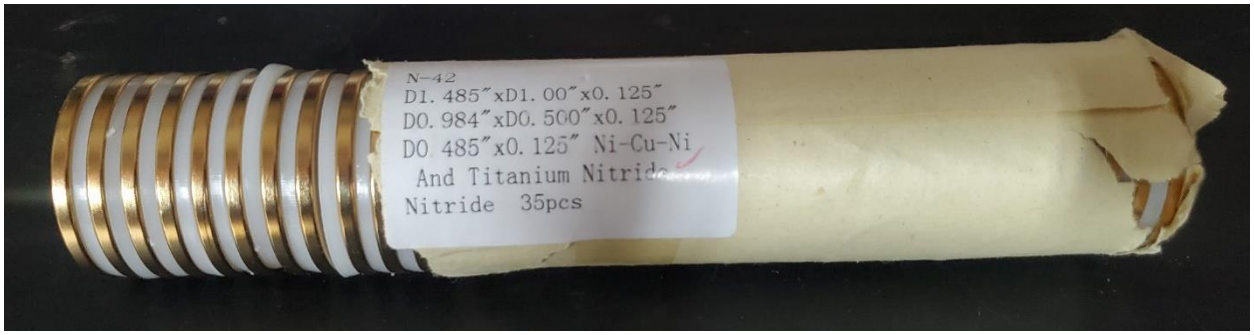
160. To address the high cost of using rare earth magnets, Baca discloses using them with ferrous inserts: "[a] surface-side attachment 110 that includes at least one magnet with an outwardly-facing north pole and at least one magnet with an outwardly-facing south pole can still provide for self-alignment, while other magnets 200 in the surface-side attachment 110 can be replaced with ferrous inserts that allow the magnets 500 in the device-side attachment 410 a ferrous surface to attractively couple to. The device-side attachment 410 within the mounting system still retains all of the magnets 500 and the ability to attractively couple to any

ferrous surface. By incorporating the ferrous inserts into the surface-side attachment 110, the overall cost of the mounting system can be reduced while affording the same level of functionality." *Id*., [0086].

161. This explicit cost-reduction teaching is significant for the present proceeding for two reasons. First, it confirms that a PHOSITA reading Baca would understand rare earth magnets of the grade Baca specifies to be a costly component whose use should be minimized. Their use is not a routine, inexpensive design choice to be freely imported into other products. *Id*., [0085], [0086]. Second, and more specifically, Baca's teaching directs the cost-reduction measure toward the surface-side attachment, the component that in the Examiner's proposed combination with Berkley is the analog of the wallet side of the claimed invention. In other words, Baca itself teaches that the component corresponding to the wallet in the proposed combination is the component where rare earth magnets should be replaced with less expensive ferrous inserts where possible, the precise opposite of the Examiner's proposed modification, which adds arrays of rare earth magnets to the wallet side of Berkley's device. A PHOSITA reading Baca's cost-reduction teaching would be directed away from loading the wallet-side component with multiple full rare earth arrays. *Id.,* [0085], [0086]. As explained below, this

teaching affirmatively undermines rather than supports the Petitioner's proposed combination.

162. In addition to the high cost to a manufacturer of purchasing rare earth magnets, there is an equally high cost of working with and assembling rare earth magnets in a high-volume production environment. The image below is how a manufacturer would receive neodymium magnets from a supplier. Unlike most neodymium magnets that are usually silver, these magnets have an additional titanium nitride coating done via vapor deposition which makes them gold in color, but aside from that, they are the same as any other neodymium magnet of the same material, N42, N48, N52 etc., and the same size and shape.



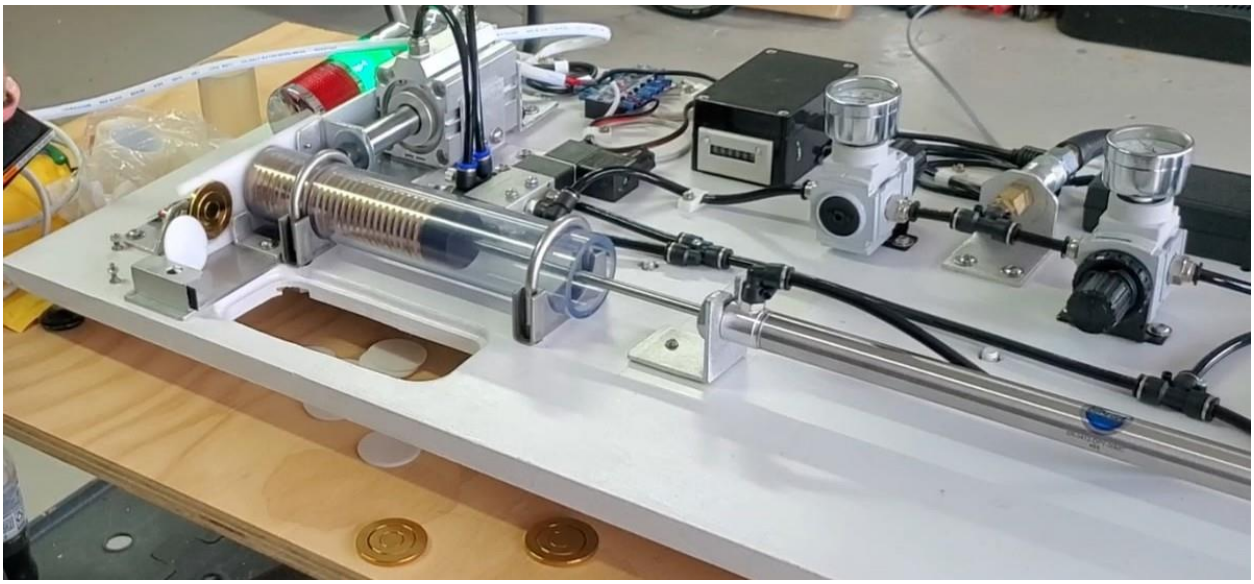
163. **Note**: Magnets like those above and the type that Baca references are referred to as Neodymium magnets but they are actually NdFeB, Neodymium-Iron-Boron; however, they are usually just referred to as Neodymium or Neo magnets.

164. When working with these high-power magnets there are a number of additional costs that are incurred other than just their piece price. First of all, over 90% of the world's Neo magnets come from China. EX2014. To purchase Neos for use in price sensitive applications, a manufacturer has to purchase directly from China, purchase in bulk, and deal with long lead times for shipping. All of this results in significant outlays of money, purchasing 3 to 9 months supplies at one time, having that money tied up, having to schedule around Chinese New Year, and not being able to react to any sudden increases in manufacturing.

165. Next, these magnets cannot just be separated by hand for assembly in volume. They cannot be simply pulled apart; they have to be slid apart and during this process if the plastic spacer between the Neos being removed and the rest of the stack drops out of place and the magnets snap back together, they become almost impossible to separate without cracking them.

166. In production, specialized machinery is needed such as what is shown below to separate them in volume. This custom designed, built, and tested machine allows for a magnet stack to be placed in the holding tube and then foot operated machine slides one magnet at a time off of the stack, keeps it held in place by a magnet to not only holds it in place but verifies its orientation, dispenses the spacer,

and increases a cycle counter to keep up with how many magnets have been separated. The cost of having a machine like this custom made to order is $30K - $45K.



167. Next the magnets have to be kept in a manner that maintains their polar orientation and does not let them get close enough together to be attracted to each other. This is an additional cost for the tooling, handling, and manufacturing time required to safely use Neos in production. These Neo magnets are so powerful that if the gap between them gets too small, they will snap together in milliseconds, and in doing so, will usually result in one, if not both, shattering. To put it bluntly, they are not easy to work with and not cheap to work with, and the magnets shown

and discussed above are only N42s which are not even as strong as the magnets that Baca teaches.

168. The magnets that are taught by Baca would be extremely difficult and expensive to attempt to sew into soft goods such as folio wallets. Attempting to maintain their orientation and spacing while keeping them from snapping onto each other is not a trivial task. EX2025, ¶¶22-23. That is part of why Baca does NOT teach the use of N48 – N52 magnets being loosely assembled. Baca teaches that these magnets need to be in a surface-side attachment housing 130 or be attached using some other secure method. EX1006, [0068] ("Surface-side attachment 110 can include a surface-side attachment housing 130 containing a plurality of magnets 200."); *id.,* [0076] ("In some embodiments, the magnets 500 can be coupled to the electronic display device 400 with, for example, a double-sided adhesive tape. Other attachment methods such as glues, mechanical latches, hinges, or elastic grip can alternatively be used."). Even Baca overly simplifies what it takes to actually include N48 – N52 magnet assemblies in an actual product. A PHOSITA would understand inherent aggregate costs of purchasing high power Neos, designing and building custom assembly jigs and machinery, and the associated complexity of working with such powerful magnets.

f. Summary

169. In summary, Baca discloses a self-aligning magnetic mounting system for attaching electronic display devices to fixed surfaces such as automobile dashboards, walls, and computer monitor bezels. *Id*., [0003], [0004], [0070]. Baca contains no disclosure of a portable wallet, card-carrying compartment, or any accessory designed for daily carry with a handheld smartphone. Baca's system is specifically engineered around high-grade rare earth magnets — N48 minimum, N52 preferred — whose strong magnetic fields are necessary for vehicular and stationary surface mounting (EX1006, [0079], [0080]) but whose field strengths at card-proximity distances exceed established magnetic stripe damage thresholds as discussed above (Section III.B). Baca itself acknowledges the high cost burden of rare earth magnets and teaches that ferrous inserts should be substituted on the surface-side attachment — the wallet analog in the proposed combination — to reduce costs. *Id*., [0085]-[0086].

170. A person of ordinary skill in the art reading Baca as of the priority date of the ‘641 Patent would understand Baca's teaching as directed to a categorically different use case from the claimed wallet-on-phone application (EX1006, [0003], [0004, [0060]), would recognize that Baca's specified rare earth magnets are incompatible with a credit card wallet application at the field strengths

Baca requires (*id.,*[0080]), and would be directed by Baca's own cost-reduction teaching away from using rare earth arrays on the wallet-side component of any combination with Berkley's wallet. *Id*., [0085], [0086].

C. Zhu's Folio (Chinese Patent Application No. 108023992A)

a. Overview

171. Chinese Patent Application No. 108023992A to Zhu (hereinafter "Zhu") discloses a folio-style mobile phone case assembly. Zhu's disclosure is directed to a case for a mobile phone that incorporates a magnetic attachment system, comprising a back plate that attaches to the rear of the mobile phone and a panel that functions as a cover or front flap of the folio case. Unlike Berkley, which is specifically designed and engineered as a credit card wallet with defined card storage, retrieval, and protection features, and unlike the '641 Patent, which claims a wallet accessory with a defined compartment for credit cards, content removal slot, and ferromagnetic shielding, Zhu is a phone case and cover.

b. Zhu's Back Plate and Magnet Groups

172. Referring to FIG. 4 (below), Zhu discloses a back plate 210 configured to attach to the rear surface of a mobile phone. The back plate 210 incorporates magnet groups 240 positioned at or near the corners of the back plate. Each magnet group 240 contains two magnets arranged with alternating north/south

polarity — that is, within each group, one magnet exposes a north pole at the outward-facing surface and the adjacent magnet exposes a south pole at the outward-facing surface. This alternating polarity arrangement within each corner group is the structural feature that Petitioner's expert Dr. Phinney identifies as relevant to the ‘641 Patent's first and second arrangements of magnetic material having adjacent regions of opposite polarity.

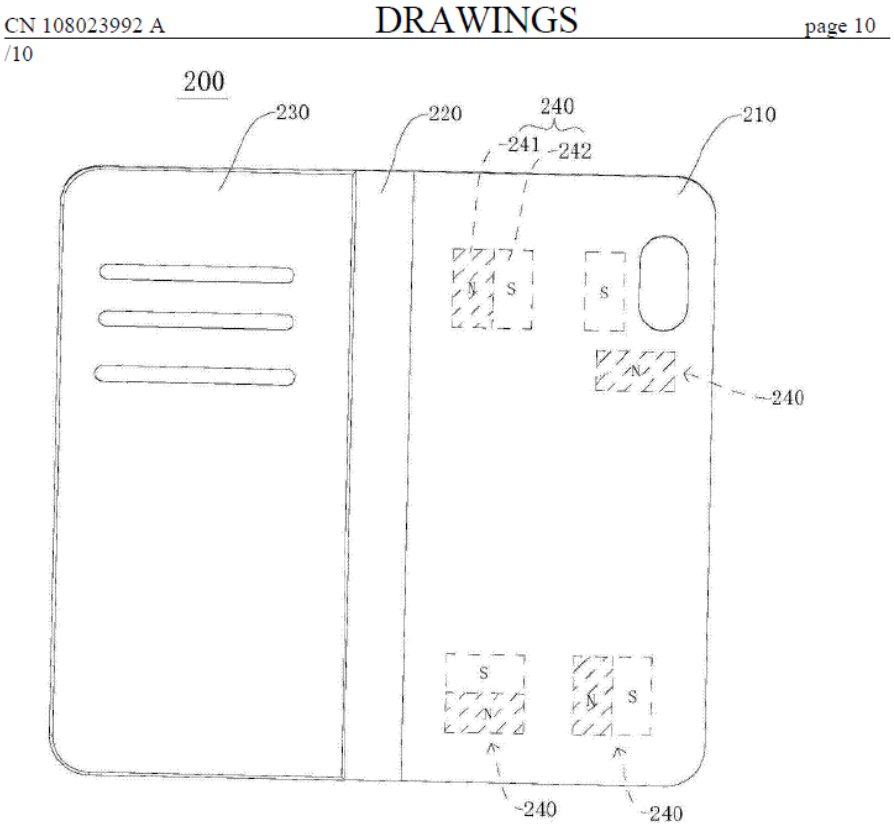


Fig. 4

c. Zhu's Front Cover (Panel 230)

173. As shown above, Zhu discloses a panel 230 that functions as the cover or front flap of the folio case — the component that folds over the front face of the phone when the case is closed. The phone, (not shown), is configured to magnetically couple to back plate 210 through the interaction of complementary magnetic arrangements 240 on both the back plate 210 and phone case surfaces, so that when the phone is coupled to the back plate 210, and you want to close the folio, you would fold panel 230 over from left to right as seen above. Panel 230 is the component that, in Petitioner's theory of the case, corresponds to the wallet body of the claimed invention.

174. A particularly significant observation regarding Zhu's panel 230 bears emphasis here, and it is one that Petitioner's own expert concedes. Petitioner's expert Dr. Phinney acknowledges in his declaration at paragraph [121] that Zhu's panel 230 depicts three elongated ovals in the figures, but that Zhu's disclosure is entirely silent as to the identity or function of those elongated ovals. EX2021, 67. Dr. Phinney offers no explanation of what those features are, what purpose they serve, or what a person of ordinary skill in the art would understand them to represent. This concession is significant. It means that to the extent Petitioner relies

on those features as corresponding to a card compartment, content removal slot, or any other structural feature of the claimed wallet, that reliance is based entirely on inference and speculation, not on anything Zhu's disclosure actually teaches. Zhu provides no written description of those features, no explanation of their function, no dimensions, and no disclosure of how they interact with the rest of the panel's structure. A person of ordinary skill in the art reading Zhu could not determine from Zhu's disclosure what those features are, let alone how they relate to the claimed compartment or content removal slot of the '641 Patent.

d. Zhu Discloses No Compartment, No Card Pockets, and No Content Removal Slot

175. Zhu discloses no compartment for storing credit cards or other card-format items as the term compartment is ordinarily understood by PHOSITA— a defined or enclosed space marked or partitioned off for the purpose of holding contents. Zhu does not explicitly disclose card pockets, card slots with defined walls, interior cavities sized and adapted to hold standard credit cards, or structural features designed to retain cards within a defined space while allowing selective removal. Zhu's disclosure also does not identify credit card storage as a design goal, does not discuss the dimensions of standard credit cards, and does not describe any

mechanism by which cards would be inserted, retained, or removed from a defined compartment.

176. To the extent Zhu's design contemplates that cards might be placed in association with the panel 230, the design relies on the top portion of cards being exposed rather than contained. This is a fundamentally different approach from the compartment-based architecture of the ‘641 Patent, in which cards are enclosed within a defined interior cavity with a receiving slot and a retaining mechanism. For example, the ‘641 Patent claims a body defining a compartment and, in claim 2, a content removal slot in the wallet. Zhu teaches none of these features. A person of ordinary skill in the art reading Zhu would not understand it to disclose a card compartment of the type claimed in the ‘641 Patent, and Petitioner's reliance on Zhu's entirely undescribed elongated features, which Petitioner's own expert cannot identify, as the equivalent of the claimed compartment or content removal slot reflects an impermissible hindsight reconstruction of the claimed invention from its component parts.

177. In addition, even if Zhu had taught card slots, the Board has already decided what a “compartment” is. The Board previously construed this term during prosecution based on a dictionary definition: “The ordinary meaning [of]

compartment is 'a part or space marked or partitioned off.'" EX1002, 455. Card slots as shown in folio style wallets are specifically designed so that part of the card ALWAYS sticks out so that enough of the card can be viewed and grasped by the user when retrieving the card from the folio style wallet. This means that the card is not in a separate "compartment" as a compartment is a space that is partitioned off, and card slots do not form a space that is partitioned off.

e. Zhu Discloses No Ferromagnetic Shield or Card Protection Mechanism

178. Zhu contains no disclosure of a ferromagnetic shield, a metallic plate, or any other mechanism designed to protect the contents of the case, or any cards placed in association with the panel, from the magnetic fields produced by the magnet groups 240. This absence is notable because it confirms that Zhu does not disclose or suggest the specific structural element required by the claimed inventions, *i.e.,* a ferromagnetic shield between the first and second magnetic arrangements and the compartment or a metallic plate between the first magnetic arrangement and the compartment.

f. Zhu Does Not Disclose Rare Earth Magnets

179. Zhu also does not specify the grade, type, or field strength of the magnets used in the magnet groups 240. Zhu does not disclose rare earth magnets,

does not reference neodymium or samarium-cobalt alloys, does not specify a minimum magnet grade, and does not address the magnetic field strength produced by the magnet groups 240 at any distance. EX1008; EX2021, 60-61. This is in direct contrast to Baca, which explicitly specifies N48 minimum neodymium rare earth magnets as a critical feature of the system and provides a detailed technical rationale for why rare earth magnet properties are necessary for the system's performance. EX1006, [0080].

180. The absence of any rare earth magnet specification in Zhu is significant for the non-obviousness analysis in two respects. First, it means that Zhu's disclosure is consistent with the use of common, low-grade permanent magnets, ferrite or low-grade neodymium, of the type that would not produce field strengths at card-proximity distances sufficient to corrupt magnetic stripe credit cards. A PHOSITA reading Zhu in isolation would have no reason to assume that rare earth magnets are required or contemplated, and would not assume that rare earth magnets are required absent a specific reason to do so. Second, and importantly, the absence of a rare earth magnets in Zhu means that those skilled in the art would have no motivation to include the claimed ferromagnetic shield or metallic plate to Zhu in order for it to function reliably. Indeed, Zhu discloses the

use of magnets to hold the phone case 100 to the panel 210 and does not disclose any need for a magnetic shield to protect any credit cards purportedly stored in panel 230 from the magnets in panel 210. Dr. Phinney agreed that Zhu did not disclose the need for a magnetic shield. EX2021, 59-60.

181. As discussed below, even if some form of shielding were added as petitioner's expert proposes, it would not prevent the credit cards from being corrupted by the magnets because part of the stored credit card's magnetic stripe would be exposed under the proposed modification.

g. Summary

182. In sum, Zhu discloses a folio-style mobile phone case assembly with alternating polarity magnet groups at the corners of a back plate of a phones case, and a panel 210 that magnetically couples to the phone case's back plate. Zhu contains no disclosure of a card compartment, card pockets, or card storage functionality of the type claimed in the '641 Patent. Petitioner's own expert concedes that Zhu's panel 230 depicts elongated features whose identity and function Zhu's disclosure does not address — a concession that fatally undermines any reliance on those features as teaching the claimed compartment or content removal slot. Zhu discloses no ferromagnetic shield or card protection mechanism. Zhu does not specify rare earth magnets or any magnet grade, and a PHOSITA

reading Zhu would have no basis for assuming that rare earth magnets of the type Baca requires are contemplated or necessary. Thus, a person of ordinary skill in the art as of the priority date of the ‘641 Patent would have had no reason to incorporate a ferromagnetic shield or metallic plate other than hindsight reconstruction of the claimed invention that the non-obviousness requirement prohibits.

D. Kinshi’s Folio (Japanese Patent Application No. 2015-4401)

a. Overview

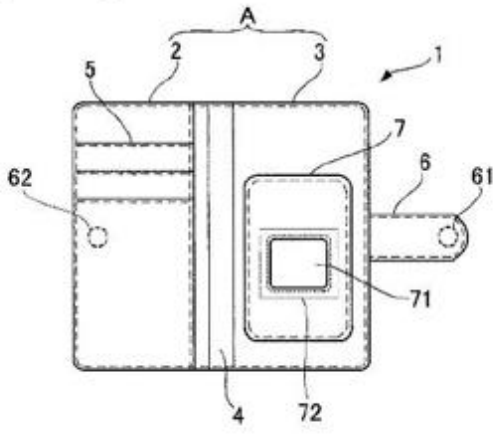
183. Japanese Patent Application No. 2015-4401 to Kinshi (hereinafter "Kinshi") discloses a similar folio-style mobile phone case assembly that combines a card-holding cover with a magnetic attachment system for securing the assembly to a mobile phone. Like Zhu, Kinshi is a phone case designed to be used in conjunction with a mobile phone rather than a standalone wallet accessory designed to attach to and detach from a smartphone as needed in the manner of the claimed invention. Petitioner relies on Kinshi as prior art allegedly disclosing certain elements of the claimed invention, including card-carrying functionality in proximity to a magnetic attachment system. As discussed below, however, Kinshi's design, in which the card pockets and the magnetic attachment elements are located on two separate structural components of the folio case, is fundamentally different

from the claimed integrated wallet in which both the card compartment and the magnetic arrangements are located within a single wallet body that attaches to and detaches from the mobile phone as a unit.

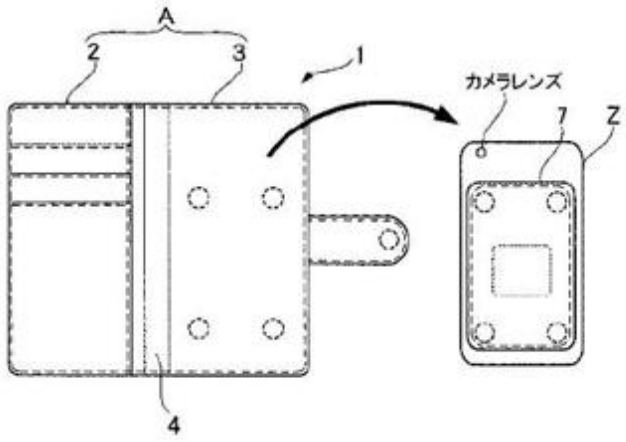
b. Kinshi's Overall Architecture — Three Separate Structural Components

184. Like Zhu, Kinshi's folio case assembly comprises three primary structural components: a base piece 3, a cover piece 2, and holding panel 7. EX1010, FIGS. 1 and 3 (shown below). Pieces 2 and 3 are connected to one another by a spine or hinge to form the folio structure. The base piece 3 is the component that engages with and holds the mobile phone, while the cover piece 2 is the component that folds over the front of the phone when the case is closed and provides card storage functionality. Kinshi's base piece 3 is configured to receive and hold the mobile phone. The base piece 3 incorporates magnets 81 that provide the magnetic attachment function of the assembly. Specifically, magnets 81 are positioned on the base piece 3 and interact with a holding panel 7 to secure the mobile phone within the base piece 3. The mobile phone is attached to the holding panel 7 with adhesive sheet 71. *Id*., [0020].

[FIG. 1]



[FIG. 3]



185. Like Zhu, Kinshi does not specify the grade, type, or field strength of the magnets 81 (shown above in FIG. 3 as the un-numbered four dashed circles on panel 3). *Id.,* FIG. 2; EX2021, 61. Kinshi does not disclose the use of rare earth magnets, does not reference neodymium or samarium-cobalt alloys, and does not address the magnetic field strength produced by magnets 81 or 82 at any distance from the magnet face. Like Zhu, Kinshi's magnet disclosure is entirely unspecified as to magnetic properties, a description consistent with the use of common, inexpensive permanent magnets that would not produce field strengths at card-proximity distances sufficient to corrupt magnetic stripe credit cards. In fact, the closest Kinshi gets to providing information on the magnet type informs a PHOSITA that ordinary kitchen magnets are used: “securing parts 82 to be

constituted by sheet-shaped magnets." EX1010, ¶27. A PHOSITA reading Kinshi would have no basis for assuming that rare earth magnets of the type Baca specifies are contemplated or required by Kinshi's design. EX2021, 60 (agreeing that Kinshi does not disclose any risk of magnetic card corruption caused by its magnets). Kinshi's cover piece 2 is the front flap of the folio case that folds over the front face of the phone when the case is in the closed position. The cover piece 2 incorporates a plurality of pockets 5 for storing cards including credit cards and identification cards. *Id*., [0015]. It is the cover piece 2, not the base piece 3, that provides the card holding functionality of Kinshi's assembly.

c. Kinshi's Open Pockets Are Not Compartments

186. Kinshi's pockets 5 are open-topped sleeves, not enclosed compartments of the type claimed in the '641 Patent. Kinshi's specification describes the pockets explicitly: "openings of the pockets 5 are formed in a direction along the horizontal direction in FIG. 1 to allow cards to be slid in and out in the vertical direction." EX1010, [0015]. This description establishes that Kinshi's pockets 5 are open at the top — cards slide in from above and are retained by the sleeve structure below, with their upper portions exposed above the pocket opening. This is fundamentally different from the claimed enclosed compartment architecture of the '641 Patent.

187. The ‘641 Patent claims a "body defining a compartment," that is, a defined, enclosed space that contains the cards within the wallet body. The ‘641 Patent's claimed wallet includes a content removal slot designed to facilitate access to cards that are fully contained within a defined compartment. In contrast, Kinshi's open-topped sleeve pockets 5, in which cards slide in and out vertically and the top portions of cards are exposed above the pocket opening, making them accessible without a removal slot. Such pockets do not constitute a "compartment" as term would be understood by a PHOSITA. A compartment, as set forth in the specification, is a partitioned off space, and this was supported by the Board as they previously construed this term during prosecution based on a dictionary definition: “The ordinary meaning [of] compartment is ‘a part or space marked or partitioned off.’” EX1002, 455. Those skilled in the art would have understood that Kinshi's pockets are more accurately characterized as sleeves or pocket that keep cards from falling out laterally while leaving them partially exposed. The partial exposure of the card above the pocket is necessary both to view the card when selecting one for use and also to be able to grab it for removal. This distinction reflects a fundamentally different approach to storing credit cards than using the enclosed compartment of the claimed invention. Furthermore, because Kinshi's pockets 5 are

open-topped and the top portions of cards are exposed, Kinshi has no need for, and does not disclose, a content removal slot that the '641 Patent claims. The open top of Kinshi's sleeve pockets inherently provides card access without requiring any specialized structural features.

d. Kinshi's Structural Separation of the Card Pockets on Cover Piece 2 and Magnets on Base Piece 3

188. A significant structural feature of Kinshi's disclosure for the present proceeding is the spatial separation of its card storage functionality and its magnetic attachment functionality on two separate structural components. In Kinshi's folio case the card pockets 5 are located on cover piece 2 while the magnets 81 are located on base piece 3. These two components are structurally separate elements of the folio case assembly, connected by a spine or hinge. When the folio case is open, cover piece 2 and base piece 3 are spatially separated, *i.e.,* the card pockets and the magnets are on opposite sides of the opened folio. When the folio case is closed, the cover piece folds over the base piece, bringing the card pockets and the magnets into closer proximity, but they remain shielded by the phone.

189. This design is fundamentally different from the claimed invention, in which both the card compartment and the magnetic arrangements are integrated into a single wallet body that functions as a unified accessory attaching to and detaching

from the mobile phone. In the claimed invention, the wallet body defines the compartment, carries the magnetic arrangements on its surface side, and incorporates the ferromagnetic shield between the magnetic arrangements and the compartment — all within a single integrated structure. In Kinshi's architecture, there is no single component that combines card storage, magnetic attachment, and any shielding element.

190. The practical consequence of this structural separation is significant. Kinshi's magnets 81, located on the base piece 3, are not adjacent to the card pockets 5 on the cover piece 2 when the folio case is open — the two components are spatially separated by the opened folio. When the folio is closed, the magnets and pockets are in proximity, but they are separated by the thickness of the phone and phone case.

e. Kinshi Discloses No Ferromagnetic Shield or Card Protection Mechanism

191. Not surprisingly, Kinshi contains no disclosure of a ferromagnetic shield, a metallic plate, or any other mechanism designed to protect the cards stored in pockets 5 from the magnetic fields produced by magnets 81. This absence is significant on multiple levels. First, it confirms that Kinshi does not disclose or suggest the specific structural element required by claims 1-10 of the ‘641 Patent —

a ferromagnetic shield between the first and second magnetic arrangements and the compartment or a metallic plate arranged between the first arrangement and the compartment. Second, Kinshi's silence on protecting the stored cards, despite disclosing the use of magnets to attach the phone to the folio, is itself informative. If the magnetic fields produced by Kinshi's magnets 81 posed a meaningful risk to the credit cards in pockets 5, one skilled in the art would have expected Kinshi to address that risk in some way. Those skilled in the art would have understood that the complete absence of any card protection measure in Kinshi means that Kinshi's unspecified magnets are of sufficiently low grade that their fields do not approach credit card damage thresholds at the distances involved in Kinshi's folio architecture and or that Kinshi's folio design did not pose any risk of credit card corruption due to the magnets. Either way, as discussed below, those skilled in the art would have not have been motivated to modify Kinshi to add a magnetic shield.

f. Summary

192. In summary, Kinshi discloses a folio-style mobile phone case assembly comprising a base piece 3 with unspecified magnets 81 for holding the mobile phone to the base piece via holding panel 7, and a cover piece 2 with open-topped sleeve pockets 5 for storing credit cards. Kinshi's card storage functionality and magnetic attachment functionality are structurally separated — a fundamental

difference from the claimed wallet's single-body wallet in which compartment, magnetic arrangements, and ferromagnetic shield are all integrated within one unified structure. Kinshi's pockets 5 are open-topped sleeves are fundamentally different from the claimed wallet's enclosed compartment with its content removal slot. Because Kinshi does not specify rare earth magnets or any magnet grade, a PHOSITA reading Kinshi would have no basis for assuming that rare earth magnets of the type Baca requires are contemplated or necessary. This, combined with Kinshi's silence about any risk of its magnets corrupting the cards, would have led a person of ordinary skill in the art as of the priority date of the '641 Patent to determine that there was no reason to incorporate a ferromagnetic shield or metallic plate to Kinshi's folio other than hindsight reconstruction of the claimed invention that the non-obviousness requirement prohibits.

E. Goto's Card Holder (U.S. Patent No. 4,647,714)

a. Overview

193. U.S. Patent No. 4,647,714 to Goto (hereinafter "Goto") discloses a card holder with magnetic shielding designed to protect magnetically sensitive cards, including credit cards with magnetic stripes, from corruption by external magnetic fields. Goto's specification identifies explicitly and addresses this known problem through a specific shielding design. Petitioner relies upon Goto to supply

the ferromagnetic shielding and metallic plate of claims 1-10. As discussed below, however, Goto's shield is specifically designed for and depends upon a fully enclosed card holder geometry — a closed, bounded structure in which the card is surrounded by shielding material on all sides — and does not teach or suggest the specific shielding configuration claimed in the '641 Patent, in which a ferromagnetic shield is positioned between magnetic arrangements and a card compartment within a single wallet body.

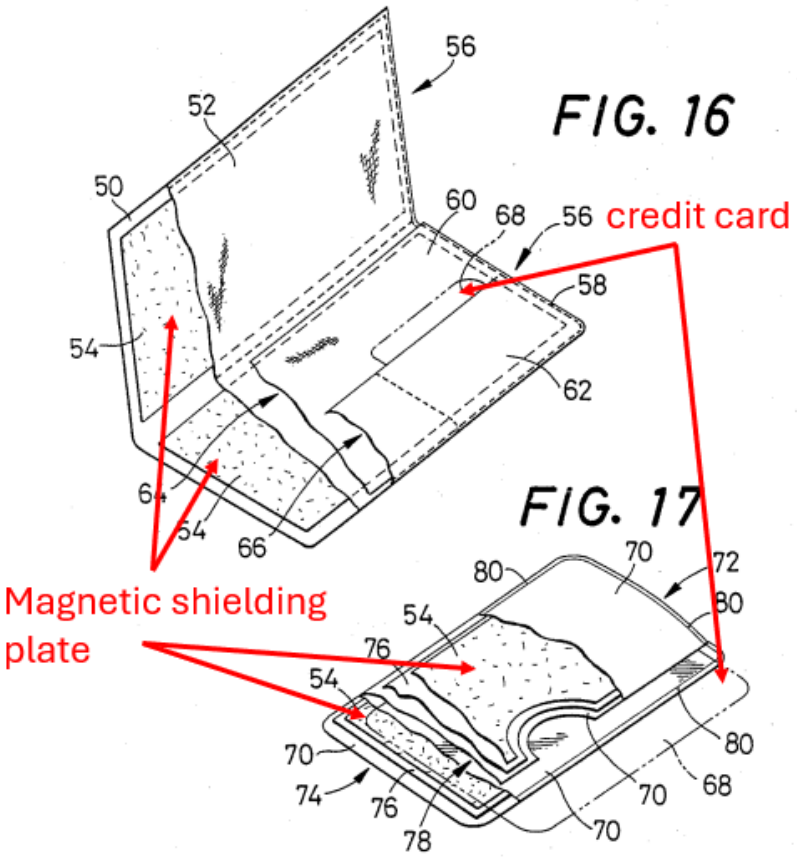
b. Goto Identifies the Problem of Magnetic Field Corruption of Credit Cards

194. Goto explicitly identifies and describes the problem of the corruption of magnetically sensitive cards by exposure to external magnetic fields. Goto states that magnetic fields from external sources such as permanent magnets can corrupt the magnetically encoded data on credit cards and similar magnetically sensitive cards, rendering them unreadable or non-functional. EX1012, col. 2:14-21. As this demonstrates, credit card corruption problem was a known, recognized problem in the prior art as of the priority date of the '641 Patent. A person of ordinary skill in the art reading Goto would be aware, as Goto explicitly confirms, that permanent magnets in proximity to credit card magnetic stripes pose a risk of data corruption, and would carry that awareness into any design analysis involving the placement of

magnets adjacent to credit cards. Dr. Phinney confirmed this understanding. EX2021, 26-27. As discussed throughout this declaration, this known risk is precisely the reason a PHOSITA would be deterred from combining Baca's strong, rare earth magnetic arrays with a wallet for holding credit card as disclosed in Berkley.

c. Goto's Magnetic Card Protection Case

195. Petitioner and its expert rely on the embodiments shown in Figures 16 through 18. EX1003, 130-131; FIGS. 16-18 (FIGS. 16 and 17 shown below). These figures and the accompanying description disclose a card holder 70 specifically designed to protect magnetically sensitive cards from external magnetic field corruption through the use of composite walls incorporating iron foil plates as shielding elements. As shown below, Goto's Figures 16 through 18 disclose a card holder having a front wall 72 and a rear wall 74, each having a magnetic shielding plate 54. EX1012, col. 12:11-13. Notably, "the front wall 72 and rear wall 74 are fused together by heat along the peripheral portion of the superposed rectangule [sic] to form a sealed card containing space 78." *Id*., 12:15-18.



196. Goto discloses that "[t]he magnetic-card 68 accommodated in this magnetic-card protection case shown in FIG. 17 is also similarly protected, since the card containing space 78, is due to the magnetic shielding plate 54 in the front wall 72 and that of the rear wall 74." *Id*., 20-27. Thus, "[e]ven when the magnetic-card protection case is exposed to magnetic force line, the card can not [sic] be affected." *Id*. The geometry of Goto's card holder 70 as shown in Figures 16 through 18 discloses that the magnetic card is fully enclosed, that is, surrounded by

composite walls containing the metal shielding plate on both its front face and its rear face, and the holder's construction fully encloses the card within the shielded structure on all sides. *Id*., col. 12:49-55 ("When a magnetic-card is put in a wallet or the like together with this composite card, one on top of the other, influence of magnetic force at least from one direction can be shielded. If the magnetic-card is sandwiched by two composite cards of this type, adverse effect of magnetic force from either direction can of course be shielded."). As such, Goto discloses that when the card is in the card holder, no portion of the card is exposed to magnetic fields.

d. Goto's Shielding Is Not Applicable to Open-Topped Sleeves or the '641's Directional Shield

197. The critical feature of Goto's magnetic card protection case, as illustrated in Figures 16 through 18, depends entirely on fully shielding the magnetic card when placed in card holder. In fact, Dr. Phinney explained that "in the magnetic world, there is permeable materials and that includes things like ferromagnetic materials, like iron, which is one thing that Goto is disclosing. And that provides -- that material provides a preferential path for magnetic flux. And that's -- it can – **it basically can guide things away from the inner compartment if you *surround that compartment* with permeable material**." EX2021, 53. This

dependency has direct and fatal consequences for both of the prior art combinations Petitioner proposes involving Goto's shielding. In particular, Goto's shielding does not function in Kinshi's open-topped sleeve pockets because the top edge of the card is exposed above the pocket opening, and there is no shielding material at or above the open top of the pocket. [EX1010, ¶15]. That is, Kinshi's pockets are not surrounded with permeable (shielding) material. Even if the metallic shielding of the type disclosed in Goto's Figures 16 through 18 were incorporated into the walls of Kinshi's open-topped sleeve pockets, those shields would provide no protection whatsoever for magnetic fields impinging on the exposed magnetic stripe in the open top of the pocket. A PHOSITA seeking to apply Goto's shielding to Kinshi's open-topped sleeve pockets would immediately recognize this geometric incompatibility upon reading Goto's specification and examining Figures 16 through 18. Goto's shielding benefit is explicitly tied to the enclosed geometry and a PHOSITA would have understood that transplanting Goto's metallic plates into Kinshi's open-topped pockets would not achieve the shielding benefit Goto describes because the open top defeats the enclosed-geometry precondition on which that benefit depends. Applying Goto's shielding benefit in Kinshi's context

would require eliminating the open-top sliding insertion and removal mechanism that Kinshi's specification describes. EX1010, ¶15.[3]

e. Summary

198. In summary, Petitioner's reliance on Goto's Figures 16 through 18 and the corresponding disclosure in the specification disclosing completely shielding the magnetic card with metallic plates in both front wall 72 and rear wall 74 is incompatible with Kinshi's open pocket card holder design. Goto explicitly identifies the card corruption problem, confirming that a PHOSITA would be aware of that problem in any design involving magnets adjacent to credit cards. Goto's stated shielding benefit depends entirely on shielding the entire cards are shown in the embodiments of Figures 16 through 18. As such, Goto's requirement of fully covering the magnetic card with metallic plates is incompatible with Kinshi's open-topped sleeve pockets, in which the open top exposes the magnetic card to the magnetic field generated by nearby magnets.

[3] To the extent that Zhu is alleged to have pockets like Kinshi, this analysis applies with equal force.

V. PETITIONER FAILS TO SHOW THAT THE '641 PATENT CLAIMS WOULD HAVE BEEN OBVIOUS

A. A PHOSITA Would Not Have Been Motivated to Apply Baca's Rare Earth Magnetic Arrays to the Wallet of Berkley

199. The use of Baca's rare earth magnetic arrays with Berkley's wallet destroys Berkley's primary use case by corrupting credit card magnetic stripes, and the "notorious" problem of magnetic interference teaches away from applying Baca's multiple array teaching to Berkley's wallet.

200. Solving the card corruption problem Baca's magnetic arrays create requires adding a ferromagnetic shield, which increases cost and manufacturing complexity which would dissuade PHOSITA from using of Baca's rare earth magnetic arrays with Berkley's wallet.

201. Baca's rare earth magnet arrays also are significantly more expensive than Berkley's existing attachment mechanisms (hook and loop or single low grade magnet), and Baca itself teaches away from using multiple rare earth arrays due to cost.

202. To the extent that a PHOSITA would have sought to add the functionality of self-alignment to Berkley's wallet, they would have known that mechanical alignment features, such as those as taught by Levy, provide a simpler, less expensive solution in the context of orienting a phone and phone case.

a. Applying Baca's Teaching of Using Rare Earth Magnetic Arrays to Berkley Would Destroy Berkley's Primary Use Case and the Known Problem of Magnetic Interference Teaches Away From Applying Baca's Multiple Array Teaching to Berkley's Wallet

i. Berkley's Purpose Is Carrying Credit Cards

203. As explained above, Berkley's wallet is solely intended to carry credit cards, identification cards, cash, and cosmetics. This is not an incidental or secondary feature of Berkley's wallet, it is the core function of the device around which every other design choice, from the dimensions of the interior cavity to the retaining press and ejection guide aperture, is organized and optimized. Berkley's specification states that the invention "relates generally to the field of portable containers" and describes the invention as "a cosmetic wallet compact that accommodates credit cards, identification cards and cosmetics for effective and easy access by users." EX1013, [0002]. The first casing is specifically "adapted and sized to accommodate a combination of at least two to four credit card(s), identification card(s), and one or more folded paper bills," and the entire structural architecture of the first casing — the receiving slot, the retaining press, the ejection guide aperture, and the interior cavity dimensioned to standard credit card specifications. *Id*., [0023]. Any modification of Berkley that compromises the integrity of the magnetic cards that the device is specifically designed to carry does

not merely degrade performance at the margins, but eliminates the primary reason the device exists and renders the modified device commercially unacceptable for its intended purpose. A person of ordinary skill in the art would recognize this immediately and would not make a modification that undermines the device's foundational purpose.

ii. Credit Card Magnetic Stripe Sensitivity

204. As explained above (Section III.B), standard credit cards conforming to ISO 7811 contain a magnetic stripe on their reverse surface that encodes account information through the orientation of ferromagnetic particles embedded in the stripe material during the card encoding process. The encoded data, including account numbers, expiration dates, and security codes, is stored as a specific pattern of magnetic particle orientations that is read by a card reader's magnetic head when the card is swiped or inserted. Exposure of the magnetic stripe to a sufficiently strong external magnetic field disrupts this encoded pattern by reorienting the ferromagnetic particles, corrupting the stored data and rendering the card unreadable or non-functional. The field strength at or above which magnetic stripe corruption occurs under typical exposure conditions ranges from 300 gauss for hotel key, gift cards or transit passes to 2750 gauss for debit and credit cards. EX2015, EX2016.

iii. Baca's Rare Earth Magnetic Arrays Produce Fields That Exceed Damage Thresholds at Relevant Distances

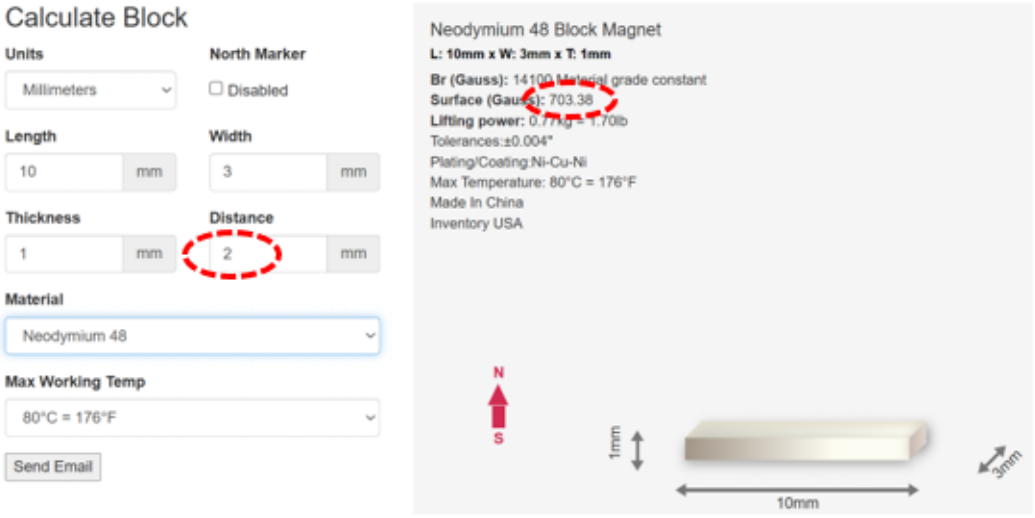
205. Baca specifies, as a minimum requirement for its mounting system, neodymium rare earth magnets of grade N48 or higher, with grade N52 preferred. EX1006, [0080]. Neodymium magnets of grade N48 and higher are among the strongest commercially available permanent magnets, possessing maximum energy products approximately three to twenty times stronger than common refrigerator magnets, EX2026[4], and up to ten times greater than common ferrite magnets of equivalent size and producing surface magnetic fields of approximately 4,000 to over 7,000 gauss, EX2020[5]. These field strengths remain substantial at distances of several millimeters from the magnet face.

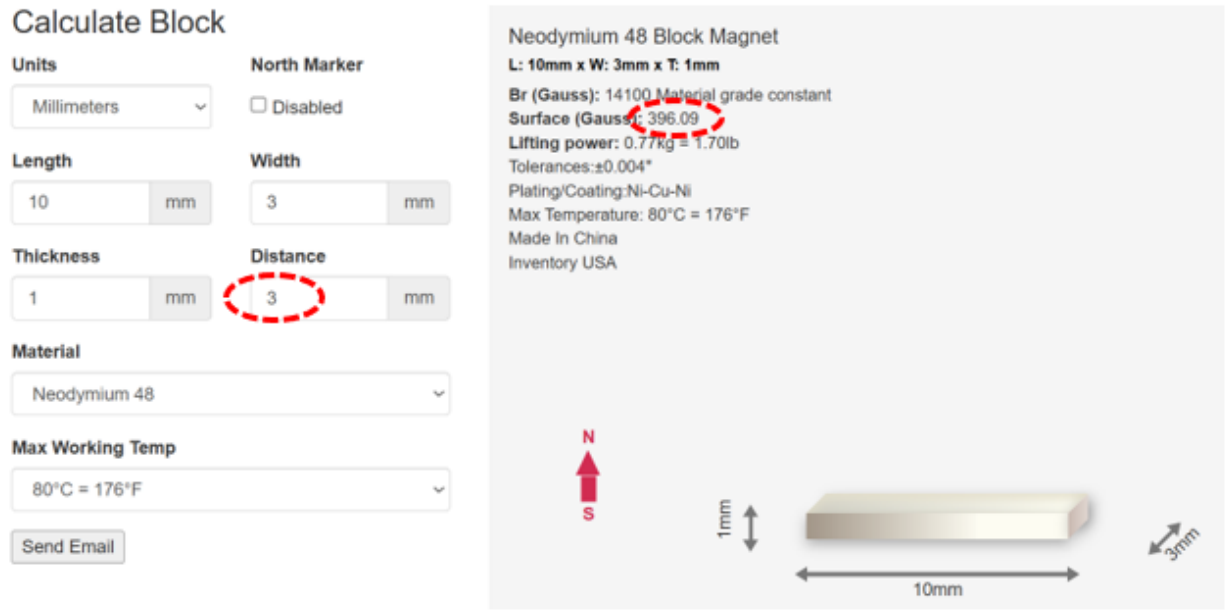
206. The images below show the field strength of a 10mm x 3mm x 1mm, (dimensions based on scaling Baca's magnets relative to the phone), N48 magnet at different distances from the surface. This is an estimation of the size of a single

[4] https://www.couragemagnet.com/magnet-blog/3360.html#:~:text=It%20should%20be%20noted%20that,Introduction%20to%20related%20flexible%20magnets;

[5] https://www.kjmagnetics.com/magnetic-field-calculator.asp

N48 magnet that Baca teaches. The first image shows the magnet's field strength at 2mm, over 700 gauss, and the second image shows the same magnet's field strength at 3mm, almost 400 gauss. This means that even at 3mm away just one of these magnets has the ability to corrupt a low coercivity card such as hotel keys, transit passes and other similar use magnetic cards.





207. In Baca's preferred embodiment, the device-side attachment incorporates two linear rows of five magnets each — ten individual N48+ neodymium magnets per array — with each magnet contributing to the cumulative field at the attachment face. *Id*., [0072]. When two such arrays of the type Baca teaches are applied to the device-side surface of Berkley's wallet, as Petitioner's proposed combination requires, the cumulative magnetic field produced by those arrays at the distances separating the device-side surface of the wallet from the card compartment interior would easily be in excess of the gauss levels needed to damage card stripes. Those skilled in the art would have understood that Baca's specified magnets, at the array configurations Baca discloses and at the proximity

distances inherent in a wallet of Berkley's dimensions, produce magnetic fields that meet or exceed the established damage threshold for ISO standard magnetic stripes for both low and high coercivity magnetic cards. This consequence is not speculative. It is a predictable and foreseeable result of implementing Baca's specific magnetic arrays in Berkley's credit card wallet configuration that a person of ordinary skill in the art would recognize before undertaking the modification.

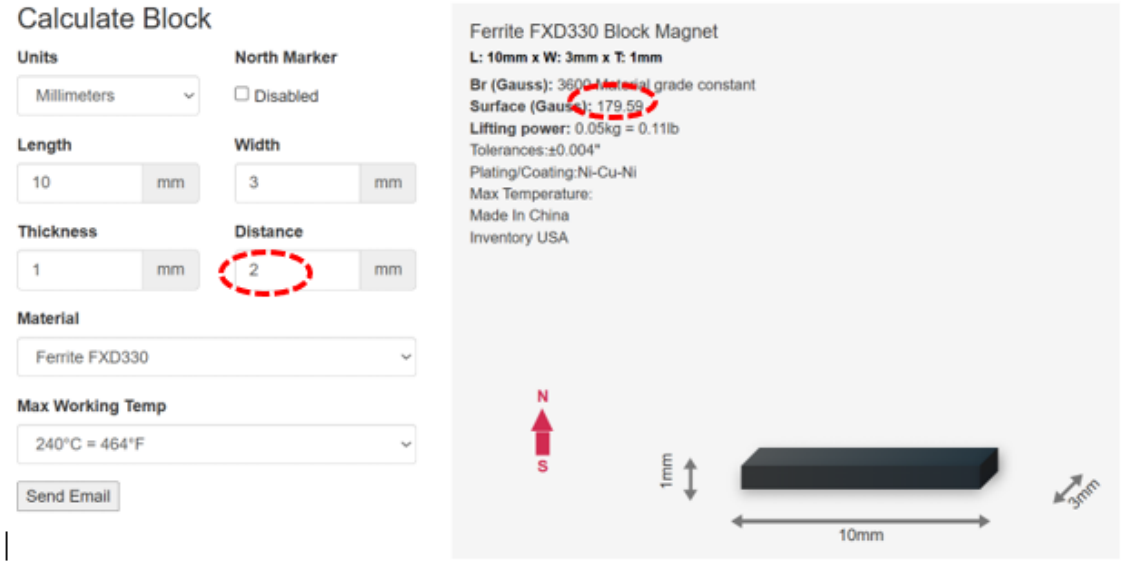
iv. Berkley's Own Single Magnet Does Not Create This Problem

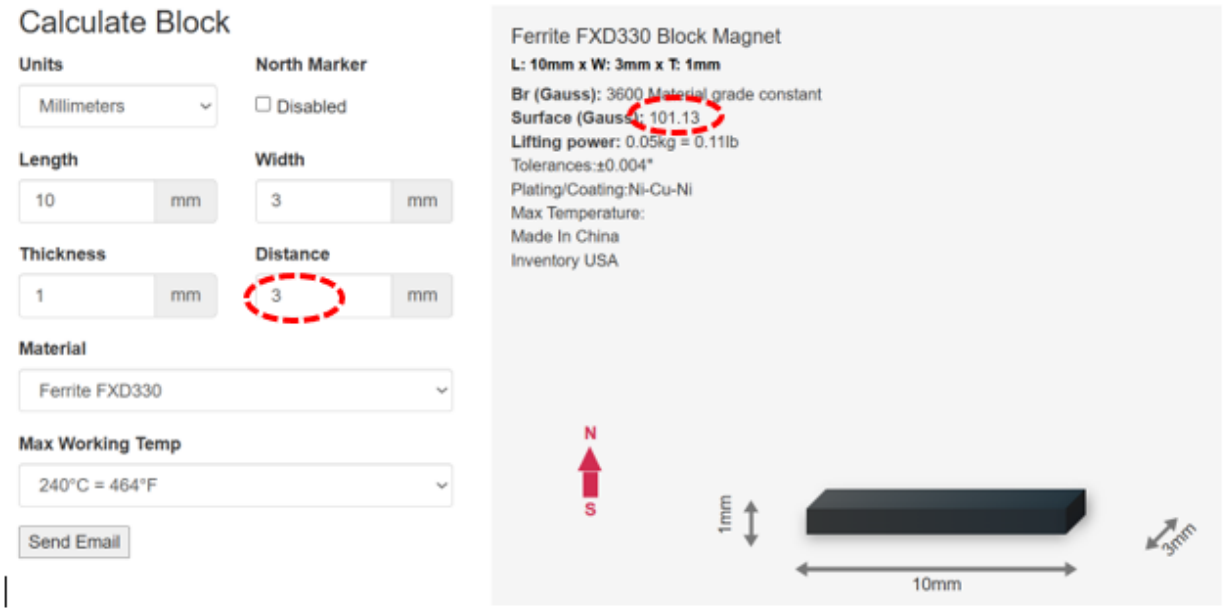
208. Berkley discloses using a simple single magnet on the base of the compact as an alternative attachment mechanism, which is described as enabling the compact to "stick" to a set of corresponding magnets attached to a smartphone, with no specification of magnet grade, field strength, or magnetic properties whatsoever. EX1013, [0029]. The field strength required to achieve simple adhesive magnetic attraction between Berkley's lightweight compact and corresponding phone-side magnets, sufficient only to hold the compact against gravity and modest handling forces in a hand-carried application, is substantially lower than the field strength produced by Baca's N48+ neodymium arrays at equivalent distances.

209. The images below show the field strength of a similar 10mm x 3mm x 1mm, ferrite magnet at different distances from the surface. This is a comparison of Baca's Neo magnets to a ferrite magnet.

210. **Note**: Even this magnet is considered a "hard ferrite" which means that it is still much stronger than a simple magnet imagined by Berkley as it only needed to "stick" the compact and phone together, not survive being vertically attached to an automobile's dashboard.

211. The first image shows the magnet's field strength at 2mm, about 180 gauss, and the second image shows the same magnet's field strength at 3mm, just over 100 gauss. This means that even at 2mm away this magnet should not be able to corrupt a low coercivity card. This is completely different than what was shown in the previous section where the N48 magnets of the same size and distance produced just over 700 gauss at 2mm and almost 400 gauss at 3mm which are both strong enough to corrupt data on cards.





212. A PHOSITA would have understood that a simple attachment magnet of the type and grade Berkley contemplates, and consistent with the use case requirements, user-removability requirement, and cost-sensitive consumer product

context of Berkley's disclosure, does not produce field strengths at card-proximity distances sufficient to damage ISO standard magnetic stripes under normal use conditions. This establishes a critical distinction: Berkley's existing single magnet sits below the card damage threshold, while Baca's N48+ magnetic arrays sit substantially above it. The proposed modification of Berkley's wallet to use Baca's magnetic arrays therefore results qualitative change that crosses the damage threshold from a safe operating region into a damaging one, transforming a device that works for its intended purpose into one that does not.

v. The Known Problem of Magnetic Interference Teaches Away From the Combination

213. I understand a reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. I further understand that the degree of teaching away will of course depend on the particular facts but that, in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant.

214. Those skilled in the art would have known that a card corruption problem would be created when applying Baca's rare earth arrays to Berkley's wallet and that this destroys the utility of Berkley's wallet by rendering the stored credit cards, identification cards, or other cards using magnetic stripes unreadable and non-functional. Dr. Phinney, in fact, relies on this known problem as motivation to add the shielding of Goto to the wallet of Berkley and folios of Zhu and Kinshi. EX2021, 26-28 (acknowledging that a PHOSITA would have recognized this problem as a "notorious" and long-standing problem, known since at least 1984). As explained above, Baca's rare earth magnetic arrays produce magnetic fields above the threshold that would damage the magnetic stripes in stored cards. A wallet that corrupts cards using magnetic stripes fails at its fundamental purpose, rendering it commercially unacceptable and operationally unsatisfactory in precisely the use case for which it was designed. A person of ordinary skill in the art would have understood the consequences flowing from Baca's disclosure of using rare earth magnetic array on Berkley's stored cards is unlikely to produce the result sought by the applicant and, as a result, would be affirmatively discouraged from making such a combination upon recognizing this consequence.

215. Critically, Petitioner's own evidence confirms this teaching away effect in a manner that creates a fundamental internal inconsistency in Petitioner's obviousness theory. Petitioner has introduced technical literature on the effects of magnetic fields on credit card magnetic stripes — specifically to support the argument that adding Goto's ferromagnetic shield to the Berkley and Baca combination would have been obvious because a person of ordinary skill would have recognized the need to protect the cards from the magnetic fields Baca's arrays produce. *See e.g.,* EX1003, Section VI.C. But this argument is self-defeating: the same technical literature that Petitioner relies upon to establish that a PHOSITA would recognize the card corruption risk and add a shield simultaneously establishes that a PHOSITA would have recognized that card corruption risk *before* making the Berkley and Baca combination in the first place. A person of ordinary skill who knows, as Petitioner's own evidence establishes they would, that Baca's rare earth magnetic arrays produce fields sufficient to corrupt credit card magnetic strips would not combine Baca's arrays with Berkley's credit card wallet.

b. Solving the Card Corruption Problem Requires a Ferromagnetic Shield, Adding Cost and Manufacturing Complexity That Negates the Motivation to Combine

i. Adding a Magnetic Shield Is Not a Trivial Addition

216. As explained above, applying Baca's rare earth magnetic arrays to Berkley's credit card wallet creates a card corruption problem that is not merely a theoretical concern. It is a foreseeable, predictable consequence that renders the combined device non-functional for its primary purpose. As Petitioner and its expert recognized, solving that problem requires the addition of a ferromagnetic shield between the magnetic arrangements and the card compartment. A person of ordinary skill in the art would recognize, however, that incorporating an effective ferromagnetic shield into Berkley's wallet is not a trivial engineering addition. It is a significant modification that requires multiple independent engineering decisions, each of which adds complexity, cost, and manufacturing difficulty to the combined device. EX2021, 55 (agreeing that adding another layer for shielding could add cost and complexity to the wallet). Such additional cost and complexity would further negate any motivation a PHOSITA would have to apply Baca's teachings to the wallet of Berkley.

217. Effective ferromagnetic shielding in a credit card wallet context requires, at a minimum, the following engineering steps, each of which presents its own design challenges:

218. **Selection of appropriate shielding material**. Not all ferromagnetic materials provide equivalent shielding effectiveness in a thin-form-factor application. Common iron foil, silicon steel, and high-permeability specialty alloys such as mu-metal each have different permeability values, different saturation flux densities, different mechanical properties, and different costs. For a shielding application in which the magnet source is as strong as Baca's N48+ rare earth arrays, which produce surface fields of 4,000 to 6,500 Gauss, the shielding material must have both high permeability and sufficient saturation flux density to handle the high flux densities that Baca's arrays produce at close proximity. A common iron foil that saturates at a flux density lower than the flux produced by Baca's arrays at the shield face will lose its permeability advantage when saturated and will fail to provide the attenuation needed to protect the stripe. This makes material selection a non-trivial engineering decision that requires knowledge of both the field source's characteristics and the shielding material's saturation behavior. A PHOSITA would have understood that selecting an appropriate shield material for

this application requires specific technical knowledge of the interaction between the field source's flux density and the candidate shielding material's saturation characteristics — knowledge that goes beyond the simple recognition that ferromagnetic materials provide shielding as put forth in Section C.

219. Reserved.

220. **Engineering of shield geometry**. As explained in the ferromagnetic shielding section above, the shield must fully interpose between the magnetic arrangements and the card compartment with no bypass path. This is a geometric requirement that is straightforward to state but non-trivial to implement in a thin wallet form factor. The shield must be sized and positioned to cover the full area of the card compartment, including the full length of every card's magnetic stripe in every loading configuration the compartment accommodates, while remaining thin enough to fit within Berkley's disclosed overall thickness of 10.5 mm without unacceptably reducing the interior cavity available for card storage. EX1013, [0025]. A PHOSITA would have understood that achieving full coverage without a thickness penalty requires precise geometry engineering that cannot be assumed to be routine for a designer working within the dimensional constraints of a consumer wallet accessory.

221. Integration into Berkley's existing layered construction without unacceptable thickness increase. Berkley's specification explicitly identifies minimizing thickness and bulk as a primary design objective. The compact's profile is designed to add "minimal bulk to the thickness of a handheld device to which it is attached," with overall dimensions of approximately 96.8 mm by 58.0 mm by 10.5 mm. EX1013, [0025, 0026]. Adding a ferromagnetic shield layer between the device side surface and the card compartment interior requires either increasing the overall thickness of the compact beyond Berkley's disclosed dimensions, potentially defeating the design objective of minimal bulk, or reducing the depth of the card compartment to accommodate the shield within the existing thickness envelope, potentially reducing the number of cards the compartment can hold. EX2021, 55-56 (agreeing that adding a shield layer could increase the thickness and weight of the wallet). A PHOSITA would have understood that integrating the shield without sacrificing either overall thickness or card capacity requires engineering analysis and design iteration that goes beyond routine modification. This, and weight implications, are discussed in the next section.

222. Reserved.

223. **Additional manufacturing steps and quality control**. Incorporating a ferromagnetic shield layer into Berkley's wallet requires additional manufacturing operations including cutting or forming the shield material to the required geometry, positioning it within the wallet's layered construction, bonding it in place, and verifying its coverage and positioning through quality control inspection. Each of these operations adds manufacturing time, labor cost, tooling requirements, and potential failure modes to the production process. A PHOSITA would have understood that these additional manufacturing requirements represent a meaningful increase in production complexity for a consumer product in which manufacturing cost efficiency is a significant design constraint.

224. Reserved.

225. A PHOSITA would have understood that the engineering complexity of incorporating an effective ferromagnetic shield into Berkley's wallet, encompassing material selection, geometry engineering, integration within the existing thickness envelope, and additional manufacturing process steps, represents a non-trivial engineering undertaking that cannot be characterized as a simple or routine modification to Berkley's existing design, and such a modification would significantly increase the overall cost to produce the modified wallet.

ii. The Shield Adds Material, Manufacturing Cost, and Increases Weight Significantly

226. The ferromagnetic shield required to protect credit card magnetic stripes from Baca's rare earth arrays adds material and manufacturing costs to the combined device that are not negligible in the context of a cost-sensitive consumer wallet accessory.

227. **Material cost of ferromagnetic shielding**. Ferromagnetic shielding materials suitable for this application, specifically thin foil or sheet forms of high-permeability alloys with sufficient saturation flux density to handle the fields produced by Baca's N48+ arrays, are not commodity materials available at minimal cost. High-permeability alloys such as mu-metal, which offer the combination of high permeability and adequate saturation flux density needed for effective shielding against strong rare earth magnet fields, carry substantially higher material costs per unit area than the common polymer, fabric, or cardboard materials used in wallet construction. Even silicon steel or grain-oriented electrical steel, which represent lower-cost alternatives to mu-metal, carry material costs that are non-trivial relative to the other materials in a consumer wallet product. A PHOSITA would have understood that the material cost of adequate ferromagnetic shielding

represents a meaningful addition to the per-unit cost of the combined product in a consumer market where price sensitivity is a significant commercial constraint.

228. Reserved.

229. **Manufacturing cost**. Incorporating the ferromagnetic shield into the wallet's construction requires additional manufacturing process steps including cutting, positioning, bonding, and inspecting the shield material, each of which adds labor and process cost. In a high-volume consumer product, even small per-unit additions to manufacturing time and process complexity translate to significant additions to total production cost. A PHOSITA would have understood that these additional manufacturing costs represent a meaningful increase in the cost of goods for a product competing in a cost-sensitive consumer accessories market.

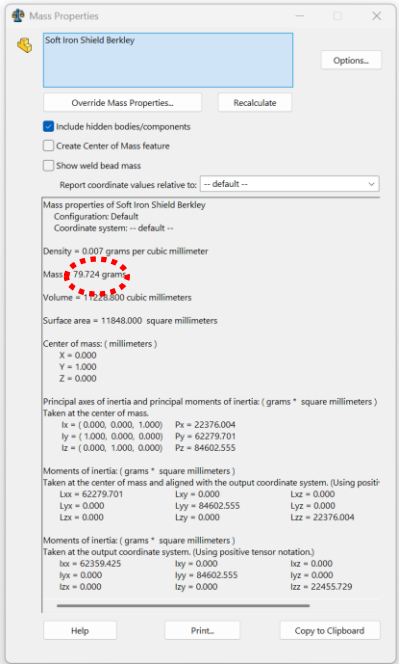
230. **Increased Weight**: There is a piece price cost associated with adding shielding material, a cost with regards to the increase in complexity, a cost associated with an increase in manufacturing costs, and finally a significant cost in marketability due to the significant increase in weight.

231. Petitioner’s expert has stated that a PHOSITA would see that applying Baca to Berkley is obvious in light of Goto. What is actually true is the opposite of that. A PHOSITA would understand the magnitude of the shielding that would be

needed to safely allow Baca's powerful magnets (*e.g.*, rare earth Neos) to be added to Berkley. A material such as Mu-metal has a high permeability but only works at lows gauss levels and Nickel alloys are extremely expensive. At higher gauss levels a PHOSITA would know that something like pure soft iron would be needed. The amount size and thickness of ductile pure iron needed to shield Baca's magnets from would require a significant increase in weight of the phone case that Berkley teaches. Dr. Phinney states that a PHOSITA would simply apply Goto's shielding to Berkley's case to protect against Baca's high power Neo magnets. In reality, that is not the case and a PHOSITA would recognize that immediately.

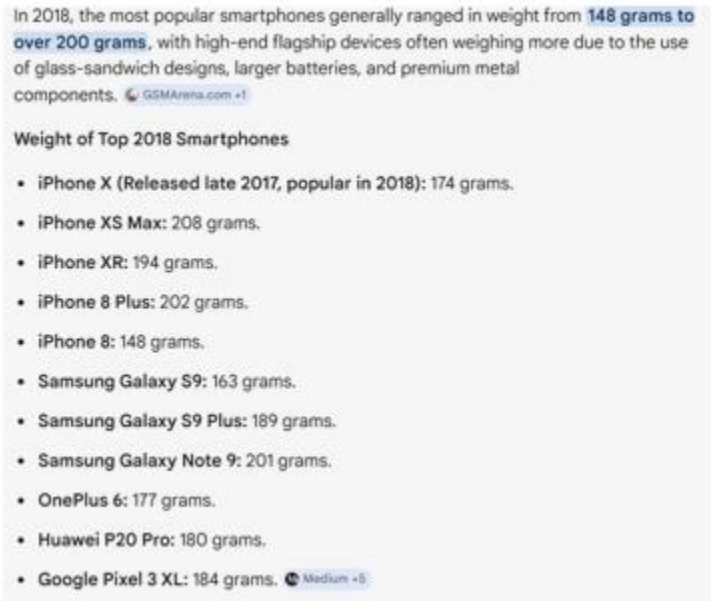
232. To protect against ordinary NdFeB magnets, Neos, between 3 and 5 mm of soft iron would be needed, according to Courage Magnet, (a company well known to those skilled in the art as a supplier of magnetic products). EX2022. Berkley's compact profile is designed to add "minimal bulk to the thickness of a handheld device to which it is attached," with overall dimensions of approximately 96.8 mm by 58.0 mm by 10.5 mm. EX1013, [0025, 0026]. Even if you ignore the recommendations made by Courage Magnets and only go with a 2mm thick plate, then the weight of Berkley's compact increases by 80g which is more than 40% of the average weight of the most popular smart phones in 2018, which was 184g, see

below. The images below show the weight of a 2mm thick piece of soft iron that matches the dimensions of Berkley's compact, 96.8mm x 58mm.



233. Those skilled in the art would have understood that this increase in weight will have negative impact on sales. For example, smart phone manufacturers constantly are cognizant of the threshold for smart phone weight. Batteries account for 20%-30% of a smart phones wight and there is an inherent trade off there. As batteries get bigger, time between charges increases which is a major selling point for any phone; however, at a certain point the phone gets too heavy. In 2018 the average weight for the most popular smart phones was 184g with the heaviest coming in at 208g. EX2023. A PHOSITA would have

understood that means that about 200g appears to be about the maximum that manufacturers have decided a phone should weigh. This means that adding 80g of shielding adds 40% of an average phone's weight as well as the actual weight of the compact.



In 2018, the most popular smartphones generally ranged in weight from **148 grams to over 200 grams**, with high-end flagship devices often weighing more due to the use of glass-sandwich designs, larger batteries, and premium metal components.

Weight of Top 2018 Smartphones

- **iPhone X (Released late 2017, popular in 2018):** 174 grams.
- **iPhone XS Max:** 208 grams.
- **iPhone XR:** 194 grams.
- **iPhone 8 Plus:** 202 grams.
- **iPhone 8:** 148 grams.
- **Samsung Galaxy S9:** 163 grams.
- **Samsung Galaxy S9 Plus:** 189 grams.
- **Samsung Galaxy Note 9:** 201 grams.
- **OnePlus 6:** 177 grams.
- **Huawei P20 Pro:** 180 grams.
- **Google Pixel 3 XL:** 184 grams.

234. Along with the potential loss or sales due to increase weight, there is the added thickness that comes with proper shielding. Using the example given earlier regarding adding a mere 1mm of soft iron shielding to the from and back of a wallet would add almost 20% additional thickness to Berkley's wallet compact. 2mm of shielding plus additional material between the shielding and the credit card slots brings the added thickness to at least 2.1mm which is exactly 20% of Berkley's 10.5 mm compact. EX1013, [0025, 0026]. Thus, a PHOSITA would

have recognized that the shielding requires the compact thicker or have less capacity for carrying cards, and that each of these would have an adverse impact on sales.

235. **Additive cost burden**. The cost of the material, the cost of increased complexity, the cost of more and more complicated manufacturing, and possible cost of lost sales associated with the ferromagnetic shield are additive to the already substantially increased magnet cost of substituting Baca's powerful magnets such as the disclosed N48+ rare earth magnetic arrays for Berkley's single unspecified attachment magnet. A PHOSITA would have understood that the total cost of the proposed combination, comprising rare earth magnet arrays plus ferromagnetic shield plus additional manufacturing complexity, represents a cost burden substantially greater than the cost of Berkley's existing attachment mechanism in a consumer product category where retail price is a significant purchasing consideration and cost engineering is a primary design constraint. These considerations would have dissuaded a PHOSITA from applying Baca’s teachings of using powerful magnets, such as the disclosed rare earth N48 Neodymium magnetic arrays, in a wallet for carrying magnetic cards such as Berkley’s.

iii. A PHOSITA Would Perform a Cost-Benefit Analysis and Find the Modification Not Worthwhile

236. A person of ordinary skill in the art designing consumer electronic accessories does not make design modifications in a vacuum. A PHOSITA evaluates modifications in terms of the costs those modifications impose relative to the benefits they provide, in the context of the product's market requirements and design constraints. A PHOSITA evaluating the proposed combination of Berkley's wallet with Baca's rare earth arrays and a ferromagnetic shield would perform precisely this cost-benefit analysis, and would have understood that the total cost and complexity of the modification package is not justified by the incremental benefit it provides over Berkley's existing attachment mechanism and the use of a mechanical alignment system used to obtain a specific orientation of the wallet to the personal electronic device.

237. The cost side of this analysis, as established above, includes the following cumulative burdens. First, replacement of Berkley's simple, inexpensive single attachment magnet with rare earth arrays of N48+ neodymium magnets represents a cost increase of potentially two orders of magnitude for the magnetic attachment components alone. Second, addition of ferromagnetic shielding material in the form of a high-permeability alloy in thin foil or sheet form adds non-trivial

material cost per unit. Third, additional manufacturing process steps for shield integration, including cutting, positioning, bonding, and inspecting, add labor and process cost. Fourth, a potential increase in overall product thickness or reduction in card capacity to accommodate the shield within the existing form factor imposes a functional cost on the modified device. Fifth, increased product weight from both the rare earth magnets and the ferromagnetic shielding material runs counter to Berkley's explicit design goal of minimizing bulk. EX1013, [0025, 0026].

238. The benefit side of this analysis is the addition of magnetic self-alignment and potentially improved attachment strength over Berkley's existing attachment mechanism in providing an attachment having a specific orientation when attached. But, as discussed below, Berkley's existing attachment mechanisms already provide adequate attachment for the wallet-on-phone application, and Levy's mechanical alignment system provides orientation control at far lower cost and complexity without the card corruption problem. The incremental benefit of Baca's rare earth magnetic arrays, in the specific context of a hand-carried wallet-on-phone application as distinct from the vehicular mounting application Baca addresses, is outweighed by the cost and complexity over other known solutions.

239. A PHOSITA would have understood that the total cost and engineering complexity of the full modification package, comprising rare earth arrays, ferromagnetic shield, and associated manufacturing complexity, is not justified by the incremental benefit over Berkley's existing attachment mechanism, particularly given the availability of Levy's mechanical alignment approach as a lower-cost (virtually free – see Section III.D.e), lower-complexity, and significantly lower product liability risk alternative that achieves orientation control without the card corruption problem and without requiring a ferromagnetic shield.

240. Petitioner has simply concluded that a PHOSITA would have been motivated to apply Baca's high-powered magnets to the wallet of Berkley with no regard to the costs of such a modification and risks involved. Petitioner has failed to show why a PHOSITA would make that costly and risky modification, nor have they shown any manufacturer that has ever done what they are stating is obvious. A PHOSITA would have easily seen that the Cost-Benefit-Risk of this modification makes no sense, would have been deterred from attempting this combination, and, to the extent they were seeking to modify Berkley to include a self-orienting feature, would have looked elsewhere for a solution such as Levy's mechanical alignment system.

iv. The Sequential Obviousness Argument Mischaracterizes the Engineering Reality

241. Petitioner's obviousness theory proceeds sequentially and in hindsight. First, a PHOSITA would combine Berkley and Baca as a purported obvious improvement, substituting (or adding) Baca's rare earth magnetic arrays for (or in addition to) Berkley's simple magnet. Then, separately, that same PHOSITA would recognize that this proposed combination requires a ferromagnetic shield to address the card corruption problem that the Berkley and Baca combination creates. This sequential framing is not merely analytically convenient for Petitioner. It is essential to Petitioner's theory, because it allows Petitioner to argue that each step in the chain is individually obvious without confronting the full cost and complexity of the complete modification package. It also is based on impermissible hindsight because a PHOSITA would not combine two incompatible features (a wallet carrying magnetic cards and the use of arrays of strong, rare earth magnets known to corrupt such cards) in the first instance to arrive at the claimed invention.

242. Based on my experience in product development of consumer electronics accessories, a person of ordinary skill in the art as of the priority date would not have approached the proposed combination of Berkley and Baca as a simple substitution of one attachment mechanism for another. A PHOSITA with

practical product development experience would have systematically worked through a recognized set of engineering and technical considerations before committing to a design modification of this type. Applying that analysis to the proposed Berkley-Baca combination leads to the conclusion that a PHOSITA would not have made the modification.

243. **Will the Proposed Modification Work for Its Intended Purpose?**

The threshold question a PHOSITA asks before undertaking any design modification is whether the modified device will function as intended. In the context of the proposed Berkley-Baca combination, the intended purpose is a credit card wallet that attaches magnetically to a personal electronic device such as a smartphone. As Dr. Phinney confirmed (EX2021, 26-28), a PHOSITA with product development experience would immediately identify the card corruption risk as a threshold functional concern: Baca's specified N48+ neodymium rare earth magnets produce magnetic fields at card-proximity distances that exceed the established damage threshold for ISO standard magnetic stripe credit cards. A device that corrupts the credit cards it is designed to carry does not work for its intended purpose.

244. **Is Anyone Else Doing This? — Competitive Analysis and Reasonable Expectation of Success.** A standard step in product development is a competitive analysis: examining the existing market to understand whether anyone else has already developed the proposed product and what solutions others have arrived at. A PHOSITA conducting a competitive analysis for a magnetically-attached credit card wallet as of the priority date of September 25, 2018 would have found no commercial product combining the dual separated alternating polarity magnetic arrays of powerful magnets in an integrated wallet body designed for carrying magnetic cards of the type the '641 patent claims. The absence of any such product in the market despite the existence of both magnetic wallet accessories and magnetic phone mounting systems is directly relevant to the reasonable expectation of success inquiry. The complete absence of any prior commercial embodiment of the proposed combination — despite the existence of all of the individual component technologies in the market — is strong evidence that a PHOSITA would not have understood that there was a reasonable expectation of success in combining these features. A PHOSITA asking "why isn't this out there already" and "is there something technically difficult that I am not seeing" would have identified the card corruption problem as the likely answer. The fact that no one working in

this field had successfully combined strong magnetic arrays with a credit card wallet and brought a commercial product to market as of the priority date is precisely the kind of market evidence that a PHOSITA with product development experience would weigh heavily in assessing whether the combination has a reasonable expectation of success. The inference a PHOSITA would draw from that absence is not that the combination is obvious and waiting to be made — it is that there is a technical obstacle preventing the combination from yielding a functional product, which is the card corruption problem that the '641's inventors recognized and solved.

245. Furthermore, the proposed combination asks a PHOSITA to combine teachings from references that are not merely different in degree but opposing in their fundamental design objectives. Berkley is a low-cost, thin-form-factor consumer wallet accessory designed to carry credit cards safely and conveniently with a simple, inexpensive attachment mechanism. Baca is a high-performance, high-cost vehicular and surface mounting system engineered around the strongest commercially available magnets (*e.g.,* N48 and N52 rare earth magnets) whose field strengths are specifically incompatible with the card-carrying purpose of Berkley's device. These are not complementary references whose teachings naturally

converge — they are references whose core design choices conflict directly. A PHOSITA recognizing this conflict would not have had a reasonable expectation that the simple combination of these disparate and opposing teachings would yield a functional product without additional inventive steps.

246. Failure Modes and Effects Analysis — The Card Corruption Risk Is a Recognized Engineering Concern That Defeats Any Reasonable Expectation of Success. A person of ordinary skill in the art with product development experience in consumer electronics accessories would apply a Failure Modes and Effects Analysis, commonly known as FMEA, to a proposed design modification involving strong permanent magnets positioned adjacent to credit card magnetic stripes. FMEA is a standard engineering tool used in product development to systematically identify potential failure modes of a design, assess their consequences, and evaluate the risk they present to the product's functionality before the design is committed to production. In the context of the proposed Berkley-Baca combination, the card corruption failure mode would appear prominently on a FMEA conducted by a PHOSITA: the placement of Baca's N48+ rare earth arrays adjacent to the card compartment of Berkley's wallet creates a foreseeable failure mode in which the magnetic fields produced by the arrays corrupt the encoded data on the credit card

magnetic stripes, rendering the cards non-functional. The consequence of this failure mode is severe — total loss of card functionality — and the probability of occurrence is not speculative but predictable based on the known field strengths of N48+ neodymium arrays and the established damage thresholds for magnetic stripe credit cards.

247. The FMEA analysis is directly relevant to the reasonable expectation of success inquiry. A PHOSITA conducting a standard FMEA before implementing the proposed combination would have identified the card corruption failure mode, assessed its consequence as critical, and concluded that the combination as proposed has a high probability of producing a non-functional product. A combination with a high probability of producing a non-functional product does not carry a reasonable expectation of success within the meaning of the obviousness standard. The FMEA analysis would therefore have led a PHOSITA to one of two conclusions: either the combination cannot be made to work without solving the card corruption problem first, which defeats any reasonable expectation of success for the simple Berkley-Baca combination; or the combination requires the simultaneous addition of a ferromagnetic shield as a necessary engineering prerequisite, which means the relevant modification is not the simple Berkley-Baca

combination proposed by the Petitioner but the more complex Berkley-Baca-shield package whose cost, complexity, and non-obvious integrated architecture are addressed throughout this declaration. In either case the FMEA analysis confirms that a PHOSITA would not have had a reasonable expectation of success in achieving the claimed invention through the simple combination of Berkley and Baca that Petitioner propose.

248. **What Technical Problems Must Be Solved?** Following from the FMEA, a PHOSITA would have identified the specific technical problems that must be solved before the proposed modification can yield a functional product. In the Berkley-Baca context, those technical problems include the following. First, the card corruption problem: selecting a ferromagnetic shielding material with adequate permeability and saturation flux density to attenuate Baca's rare earth array fields below the magnetic stripe damage threshold across the full length of every card in the compartment, in every loading configuration, without relying on a bypass-path-prone open geometry. Second, the shield integration problem: incorporating an effective ferromagnetic shield into Berkley's existing thin-form-factor wallet construction without unacceptably increasing overall thickness or reducing card capacity, consistent with Berkley's explicit design goal of minimizing bulk. Third,

the geometric coverage problem: ensuring the shield fully interposes between the magnetic arrangements and the card compartment with no bypass air path, which as established in this declaration requires a fully enclosed geometry that is structurally incompatible with open-topped pocket designs. These are not trivial engineering problems. Each requires specific technical knowledge, design analysis, prototyping, and testing before the modification yields a functional product. A PHOSITA who identified these technical problems through standard product development analysis would not characterize the Berkley-Baca combination as an obvious modification with a reasonable expectation of success.

249. **What Are the Non-Recurring Engineering Costs? — Including the Specialized Equipment That High-Powered Magnets Require.** A PHOSITA with product development experience understands that engineering a new product or a significant product modification requires Non-Recurring Engineering expenditures, commonly known as NREs, that represent upfront costs incurred before a single unit of the modified product is manufactured. For the proposed Berkley-Baca combination, the NREs would include the following categories of upfront engineering investment that a PHOSITA would have recognized and evaluated before committing to the modification.

250. **Design engineering costs.** Selecting and specifying the ferromagnetic shielding material with appropriate permeability and saturation flux density characteristics for the specific field strengths Baca's arrays produce, engineering the shield geometry for full coverage without bypass paths, and redesigning Berkley's layered wallet construction to integrate the shield within the existing thickness envelope all require dedicated engineering effort that is not routine.

251. **Prototyping costs.** Fabricating test units of the modified wallet incorporating both the rare earth arrays and the ferromagnetic shield requires prototype tooling and materials in sufficient quantity to evaluate the card corruption protection across different card types, loading configurations, and use scenarios.

252. **Testing costs.** Characterizing the magnetic field strengths at card-proximity distances with and without the shield, comparing the measured field strengths to the magnetic stripe damage thresholds for both low coercivity and high coercivity card formats, and iterating the design until adequate protection is demonstrated all require specialized test equipment and technical expertise.

253. **Specialized equipment and assembly jigs for high-powered rare earth magnets.** This is a manufacturing NRE consideration that is specific to strong magnets such as rare earth magnets and that a PHOSITA with product

development experience in magnet-containing consumer products would immediately recognize. High-powered magnets such as the grade Baca specifies — N48 and N52 neodymium — are not handled or assembled using standard consumer electronics manufacturing equipment and processes. Their extremely strong magnetic fields create significant handling and assembly challenges that require purpose-built solutions. Specifically, a PHOSITA would recognize the following requirements. First, custom assembly jigs are required to position and hold individual rare earth magnets in the precise alternating polarity arrangement that Baca's self-alignment function requires, because the strong attractive and repulsive forces between adjacent magnets during assembly make manual positioning without fixturing impractical and inconsistent. A magnet placed incorrectly during assembly — wrong polarity orientation, wrong position — cannot be easily repositioned by hand because the forces between adjacent magnets resist repositioning and the magnet will snap back to an incorrect position unless constrained by a jig. Second, specialized handling equipment is required to prevent magnets from snapping together uncontrollably during assembly, which can damage the magnets — rare earth magnets are brittle and chip or crack easily when they collide at speed under their own magnetic attraction — and can cause personal

injury to assembly workers. Third, ferromagnetic tooling and fixtures cannot be used in proximity to the magnets during assembly because they will be attracted to the magnets and disrupt the assembly process, requiring non-ferrous tooling materials such as aluminum, brass, or non-magnetic stainless steel throughout the assembly process. Fourth, the simultaneous integration of a ferromagnetic shield layer and rare earth magnet arrays into a single thin wallet body requires careful sequencing of assembly steps to prevent the shield from interfering with the magnet positioning process — the shield's high permeability creates its own magnetic circuit interactions with the magnets during assembly that must be managed through jig design and assembly sequence control. These specialized equipment and jig requirements represent a meaningful NRE investment that is specific to the rare earth magnet integration and that does not arise with Berkley's existing simple magnet or hook and loop fastener attachment mechanisms. A PHOSITA evaluating the NRE cost of the proposed modification would have recognized these specialized equipment requirements as a significant component of the upfront investment, adding materially to the total NRE burden and further undermining the cost-benefit case for the modification. EX2024, ¶¶ 37-41.

254. **What Is the Piece Price Impact?** Beyond the upfront NREs, a PHOSITA with product development experience would evaluate the piece price impact of the proposed modification — the per-unit material and manufacturing cost addition that the modification introduces into every unit of the modified product. For the proposed Berkley-Baca combination, the piece price additions include the cost of N48 or N52 grade neodymium rare earth magnets in the quantities Baca's array architecture requires, the cost of ferromagnetic shielding material in the thin foil or sheet form required for effective shielding in a wallet form factor, and the additional direct labor and manufacturing overhead associated with integrating both the magnet arrays and the ferromagnetic shield into the wallet's layered construction. As discussed below (Section V.A.c.ii), the per-unit cost of N48+ neodymium magnets in the quantities required for two full arrays substantially exceeds the cost of Berkley's existing attachment mechanism, and the ferromagnetic shielding material adds further material cost on top of the already-increased magnet cost. A PHOSITA evaluating the piece price impact in the context of a cost-sensitive consumer wallet accessory product would have concluded that the total piece price addition is not justified by the incremental benefit of the modification in the hand-carried wallet-on-phone application.

255. **How Will This Be Made? — Manufacturing Considerations.** A PHOSITA with product development experience understands that the manufacturability of a design modification is a critical engineering consideration that must be evaluated before committing to the modification. The proposed Berkley-Baca combination introduces manufacturing requirements that Berkley's existing production process does not address. Integrating rare earth magnet arrays into a thin wallet body requires precise positioning and bonding of multiple individual magnets in a specific alternating polarity arrangement, with tight dimensional tolerances to ensure correct pole pattern geometry relative to the complementary phone-side arrays. As discussed in the NRE section above, this integration requires custom assembly jigs and specialized non-ferrous tooling that are not part of Berkley's existing manufacturing process and that represent additional capital investment in production equipment. Integrating a ferromagnetic shield requires cutting or forming the shielding material to precise dimensions, positioning it within the wallet's layered construction with accurate placement relative to the card compartment boundary, and bonding it in place with adhesive or other means that maintain position under normal use conditions. Both of these manufacturing requirements introduce new process steps, new tooling requirements,

new quality control inspection requirements, and new potential failure modes in the manufacturing process itself. A PHOSITA would have recognized that these manufacturing requirements represent a meaningful increase in production complexity for a consumer accessory product, and would have evaluated them as part of the overall cost-benefit analysis of the proposed modification.

256. Summary — The Product Development Analysis Leads Away From the Proposed Combination and Confirms the Absence of a Reasonable Expectation of Success. Applying the standard engineering and product development analysis that a PHOSITA with practical consumer electronics accessory experience would conduct before committing to the proposed Berkley-Baca combination leads systematically and independently to the conclusion that a PHOSITA would not have been motivated to make the combination and would not have had a reasonable expectation of success in achieving the claimed invention through that combination. The modification fails at the threshold functional question because it corrupts the cards the device is designed to carry. A competitive analysis of the existing market would reveal that no one working in this field had successfully combined strong magnetic arrays with a credit card wallet and produced a functional commercial product as of the priority date — confirming that the technical obstacles to the

combination were recognized by those of ordinary skill and had not been overcome. A standard FMEA would identify the card corruption failure mode as critical and would establish that the simple Berkley-Baca combination does not have a reasonable expectation of producing a functional product without first solving that failure mode. The technical problems required to solve the card corruption failure mode represent engineering challenges that a PHOSITA would not characterize as routine. The NREs required to implement the full modification — including the specialized assembly jigs, non-ferrous tooling, and handling equipment that high-powered rare earth magnets require — represent a significant upfront investment not justified by the incremental benefit of the modification. The piece price additions further undermine the cost-benefit case in a cost-sensitive consumer market. And the manufacturing complexity introduced by integrating strong magnetic arrays and ferromagnetic shielding into a thin consumer wallet adds further cost and risk that reinforces the conclusion that the modification is not an obvious engineering choice. A PHOSITA working through this analysis would not arrive at the proposed combination as an obvious design improvement — they would identify it as a costly, complex, and technically problematic direction that generates more engineering problems than it solves, that lacks a reasonable

expectation of success, and that a competent product development engineer would not pursue when Levy's mechanical alignment approach provides a simpler, less expensive, and technically straightforward alternative for achieving orientation control in Berkley's wallet application.

257. This is not an all-inclusive list as it will change some based on the product being developed, but all of these things are considered basically all at once when thinking about developing a new product, and it doesn't matter if it's a totally new product, a combination of a few existing products, or simply an improvement on an existing product. A PHOSITA would not considers developing a new product without considering these things, and it is never done in a serial manner as Petitioner and its expert have done.

258. In this specific case, the Petitioner's sequential framing mischaracterizes how a person of ordinary skill in the art would actually approach the engineering problem, and the Board should reject the proposed combination for the following reasons.

259. A PHOSITA would not have made combinations without recognizing their consequences. A person of ordinary skill in the art is presumed to know the relevant art, including the well-documented sensitivity of credit card magnetic

stripes to external magnetic fields and the damage thresholds established in the published technical literature. A PHOSITA who knows these facts, as Petitioner's own evidence establishes they would, would not combine Berkley's credit card wallet with Baca's N48+ rare earth magnetic arrays without simultaneously recognizing that the combination creates a card corruption problem. The recognition of that problem is not a separate, subsequent engineering insight that occurs after the combination has been made. It is a foreseeable consequence of the combination that a PHOSITA would identify before committing to the proposed design modification. Petitioner's sequential framing treats the card corruption problem as a discovery that a PHOSITA makes after implementing the combination, as if a competent engineer would first assemble a device that destroys its own primary contents and then, upon discovering this deficiency, add a shield. A PHOSITA would have understood this consequence at the outset, not as an afterthought.

260. A PHOSITA would evaluate the complete modification package. Because a PHOSITA who knows the relevant art would recognize the card corruption problem before making the combination, that PHOSITA would evaluate the relevant design question as whether it is worthwhile to combine Berkley's wallet

with Baca's rare earth arrays and a ferromagnetic shield as a single integrated package. This is the correct framing of the cost-benefit-risk analysis described above, and as that analysis establishes, a PHOSITA would have understood that the answer is no. The total cost and complexity of the complete package, comprising rare earth arrays plus ferromagnetic shield plus additional manufacturing steps, is not justified by, at most, an incremental benefit over Berkley's existing attachment mechanism combined with mechanical alignment systems in the hand-carried wallet-on-phone context. Petitioner's sequential framing obscures this conclusion by breaking the complete modification into individually modest steps and arguing each step separately. But the legal standard for obviousness asks whether a PHOSITA would have been motivated to make the proposed modification, not whether each component of the modification merely can be found somewhere in the prior art, which, as noted, amounts to impermissible hindsight. When the invention is viewed as a whole, a PHOSITA would have understood that the combination would not have been obvious.

c. Baca's Rare Earth Magnet Arrays Are Significantly More Expensive Than Berkley's Existing Attachment, and Baca

Itself Teaches Away From Using Multiple Rare Earth Arrays Due to Cost

261. **Note**: *Section c*. speaks to the expense of Baca's rare-earth or Neo magnets. Please refer back to Section IV.B.e for a more in depth discussion of the details of the expenses associated with working with Neos in production.

i. Berkley's Attachment Mechanism Is Low Cost

262. Berkley's primary attachment mechanism is hook and loop fastener, commonly known by the trade name Velcro®. Hook and loop fastener is a commodity material manufactured at industrial scale and available at minimal per-unit cost in the consumer products market. Berkley's specification discloses that a single set of mating strips of hook and loop fastener measuring approximately 60 mm by 19 mm, positioned in the center of the compact, is sufficient for attachment. EX1013, [0028]. In an alternative preferred embodiment, two sets of mating strips are positioned at the forward and rear ends of the base, providing additional surface area for a better connection between the base and the handheld device. *Id*. In either configuration, the hook and loop fastener material is a low-cost commodity component that contributes minimally to the per-unit material cost of the device and adds zero uncertainty or unknown risk.

263. Berkley's alternative attachment mechanism consisting of a single magnet placed on the base of the compact that enables it to stick to corresponding magnets attached to a smartphone, is similarly a low-cost component. Berkley specifies no magnet grade, no minimum field strength, and no particular magnetic material for this alternative attachment, describing it only in functional terms as enabling the compact to "stick" to corresponding magnets on the phone. *Id*., [0029]. The functional requirement for this attachment is modest: the magnet need only hold a lightweight cosmetic wallet compact against gravity and modest handling forces in a hand-carried application. A PHOSITA would have understood that this functional requirement is satisfied by a simple, inexpensive permanent magnet of the type available as a commodity component at a cost of fractions of a cent to a few cents per unit, consistent with the cost-sensitive consumer product context of Berkley's disclosure. Berkley identifies no problem with the cost of either of its existing attachment mechanisms, confirming that cost is not a design constraint that its existing attachment solutions create.

ii. Baca's Magnetic Arrays Are Substantially More Expensive

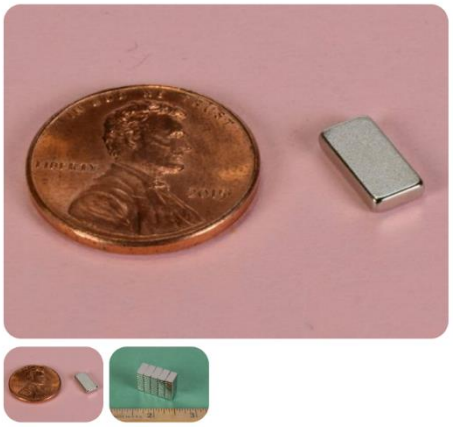
264. Baca's mounting system is built around a specific class of magnets that are categorically more expensive than the simple attachment magnet Berkley

contemplates: neodymium rare earth magnets of grade N48 or higher, with grade N52 preferred. EX1006, [0080]. Baca explicitly states that neodymium magnets of grade N48 and higher are preferred, and that neodymium magnets of grade N52 and higher are more preferred, and provides a specific technical rationale for this grade requirement: rare earth magnets are selected for their strongly magnetic properties including a higher maximum energy product than other types of magnets including ferrite and alnico magnets. Id. This grade specification reflects the engineering reality that Baca's vehicular and surface mounting application requires the field strengths that only high-grade rare earth magnets can provide.

265. The quantity of magnets required by Baca's representative embodiments compounds the cost impact of the high per-unit magnet price. Baca's disclosed embodiments use one or two linear rows of five magnets each per device-side attachment, for a total of at least five individual N48+ neodymium magnets per attachment point. *Id*., [0072]. Applying Baca's teaching to Berkley's wallet in the manner Petitioner's combination proposes would require one to two such arrays on the wallet side of the combination, for a total of approximately ten to twenty individual rare earth magnets in the wallet alone, in addition to complementary arrays on the phone case side of the combination. A PHOSITA would have

understood that the per-unit cost of N48 and N52 grade neodymium magnets of the size and configuration Baca discloses is substantially greater than the cost of the commodity attachment magnet Berkley contemplates, and that the total cost of ten to twenty or more such magnets in a single consumer wallet accessory represents a material cost burden that is orders of magnitude greater than Berkley's existing attachment mechanism. The following paragraphs compare the cost of Berkley's hook and loop fastening method with Baca's magnetic array and then Berkley's singular magnet attachment to Baca's magnetic array.

266. The image below is from K&J magnets showing that the cost of a single N52 magnet that is similar in size to what is taught by Baca cost $0.35 if you purchase 25,000 or more at a time. Baca shows a surface side attachment array of 5 magnets and a device that matches up to a device side array of 15 magnets. Baca discloses other embodiments with more magnets, but if this minimum array of magnets was used, then the cost would be an additional $7.00 per unit just for the device side magnets, ([15+5] x $0.35) This does not include the cost of the surface-side attachment housing, the double-sided tape needed to hold the device-side magnets in place, or the tooling needed to ensure that the device-side magnet array remain correctly positioned.



3/8 x 3/16 x 1/16 Inch Neodymium Rare Earth Bar Magnet N52 B631-N52

Buy more, Save more!
Quantity based discounts

Price ea.	Qty	Discount
$0.43	1-49	
$0.42	50-99	2% Off
$0.41	100-499	5% Off
$0.40	500-999	7% Off
$0.38	1000-2499	12% Off
$0.37	2500-9999	14% Off
$0.36	10000-24999	16% Off
$0.35	25000-49999	19% Off

Email us for even **bigger discounts** on higher order quantities

267. In contrast to that, as shown in the advertisement below, heavy duty hook and loop fastener with adhesive backing cost $9.48 for 30 feet. This translates into $0.0526 for a full 2 inches of both the hook and loop sides of the fastener. Also, there is no additional tooling required to assembly hook and loop fasteners other than a pair of scissors. The comparison shows that the Baca's magnetic array of 20 Neo magnets is literally 133 times more expensive than what Berkley taught with the hook and loop fastener, ($7 / $.0526).



268. Either way, a PHOSITA would have understood that the there is nothing gained by attempting to combine Baca's magnet array with Berkley's wallet as compared to Berkley's teaching using a single magnet or hook and loop fastener.

iii. Baca Itself Identifies Cost as a Reason to Avoid Multiple Rare Earth Magnets

269. Berkley itself explicitly identifies the cost of rare earth magnets as a design problem and teaches a person of ordinary skill to substitute ferrous inserts for rare earth magnets where possible in order to reduce costs. EX1006, [0085], [0086]. In particular, Baca discloses that:

270. "Ferrous inserts can also be used in surface-side attachments 110 to reduce product costs. **Rare earth magnets 200 tend to be expensive**." *Id*., [0085] (emphasis added); *see id.,* [0086] ("A surface-side attachment 110 that includes at

least one magnet with an outwardly-facing north pole and at least one magnet with an outwardly-facing south pole can still provide for self-alignment, while other magnets 200 in the surface-side attachment 110 can be replaced with ferrous inserts that allow the magnets 500 in the device-side attachment 410 a ferrous surface to attractively couple to. The device-side attachment 410 within the mounting system still retains all of the magnets 500 and the ability to attractively couple to any ferrous surface. By incorporating the ferrous inserts into the surface-side attachment 110, the overall cost of the mounting system can be reduced while affording the same level of functionality.").

271. This explicit cost-reduction teaching in Baca is directly and fatally inconsistent with Petitioner's use of Baca to motivate the proposed combination. Petitioner argues that a PHOSITA would be motivated to import Baca's rare earth magnetic arrays into Berkley's wallet. But Baca itself instructs a PHOSITA that rare earth magnets are expensive and that ferrous inserts should be substituted for rare earth magnets where possible to reduce product costs. A PHOSITA following Baca's own cost-reduction teaching would be directed away from modifying Berkley's wallet by using multiple, rare earth magnetic arrays.

iv. Consumer Wallet Accessories Are Price-Sensitive Products

272. The cost arguments above do not operate in a vacuum. They must be evaluated in the context of the specific consumer market that Berkley's wallet accessory targets, and that market context strongly reinforces the conclusion that a PHOSITA would not import Baca's expensive rare earth magnetic array system into Berkley's design.

273. Berkley's wallet compact is explicitly designed as a consumer product for individual users seeking a convenient, portable accessory for daily carry. Berkley's background section identifies the design goal as enabling individuals to "become more mobile" by combining a cosmetic compact with a card-carrying wallet that attaches to a smartphone, replacing the need for a larger carrying instrument such as a pocketbook, handbag, or wallet. EX1006, [0003]. This is a mass-market consumer product whose commercial viability depends on being manufacturable and sellable at a price point accessible to individual consumers. In this market context, per-unit material costs are a primary design constraint, and additions to those costs must be justified by proportionate additions to consumer-perceived value or product performance.

274. Baca's mounting system, by contrast, is designed for use cases in which performance requirements justify substantially higher component costs. Baca's primary described applications are mounting a smartphone to an automobile dashboard EX1013, [0070, Fig. 16] and mounting a display to an office computer monitor bezel [0070] — applications in which the user requires reliable, vibration-resistant attachment during vehicle operation or stable hands-free viewing in a professional setting. In these applications, the high holding force and self-aligning performance of N48+ rare earth arrays justifies the premium cost of those components because the performance requirements cannot be met by less expensive alternatives. A consumer who purchases a vehicular phone mount for daily driving use has both the functional need for high-strength magnetic attachment and the context in which the cost of rare earth magnets is a small fraction of the total system cost including the mount hardware, vehicle installation, and associated components.

275. These are categorically different markets with categorically different cost-performance tradeoffs. A PHOSITA designing a consumer wallet accessory for the mass market that Berkley targets would not import Baca's high-cost rare earth magnetic array into a product whose commercial viability depends on accessible price point, without a compelling functional justification that the prior art does not

provide. Berkley's existing attachment mechanisms, hook and loop fastener and a simple single magnet, already provide adequate attachment for the wallet-on-phone application at minimal cost. The incremental self-alignment benefit of Baca's expensive rare earth arrays in the specific hand-carried application context of Berkley's wallet does not justify the cost increase that substitution requires.

276. A PHOSITA would have understood that the cost differential between Berkley's existing attachment mechanisms and Baca's rare earth array system, in the context of a cost-sensitive mass-market consumer wallet accessory, provides an independent and affirmative reason not to make the proposed combination, and that Petitioner has identified no compelling functional justification for incurring that cost differential that the prior art of record supports.

d. A PHOSITA Seeking Self-Alignment and Orientation Starting From Berkley Would Use Mechanical Alignment Features as Taught by Levy — Not Baca's Costly and Interference-Prone Magnetic Arrays

i. Self-Alignment Is Not Required by Berkley and No Problem With Its Absence Is Identified

277. Berkley's primary attachment mechanism is hook and loop fastener, which by its nature provides no orientation preference — the user attaches the compact to the phone in whatever position is convenient, and the fastener holds it there regardless of orientation. Berkley's alternative single magnet attachment

similarly imposes no specific orientation requirement on the wallet relative to the phone. Berkley's specification identifies no problem with the absence of orientation control, does not identify inconsistent orientation as a user complaint or design deficiency, and does not identify orientation control as a design goal that the invention seeks to achieve. The absence of any orientation-related problem statement in Berkley is itself significant: a PHOSITA does not add engineering complexity, cost, and manufacturing difficulty to a consumer product to solve a problem that the reference itself does not identify or that would not have been apparent to a PHOSITA. Absent hindsight, a PHOSITA reading Berkley would find no motivation in Berkley's disclosure to seek out an orientation-controlling attachment system, and no basis for concluding that the absence of orientation control in Berkley's existing design represents a deficiency that a person of ordinary skill would be motivated to correct.

ii. If a PHOSITA Did Want to Add Self-Alignment/Fixed Orientation to Berkley, Levy Provides the Obvious and Superior Solution

278. If, notwithstanding the absence of any reason to address the need for a specific orientation, a PHOSITA did seek to add self-alignment and fixed orientation capability to Berkley's wallet, the prior art of record contains an obvious solution that a PHOSITA would immediately recognize as compatible with

Berkley's design, consistent with Berkley's attachment philosophy, and superior to Baca's approach on every metric relevant to Berkley's use case for storing magnetic cards. That solution is Levy's mechanical alignment system. Levy's mounting system is compatible with Berkley's wallet application in several respects that a PHOSITA would immediately recognize, as the Examiner did when he combined Berkley with Levy, and that compatibility further supports the conclusion that a PHOSITA would look to Levy rather than Baca when seeking to improve Berkley's attachment mechanism.

279. Same device context. Both Berkley and Levy are directed to accessories for handheld personal electronic devices — smartphones specifically. EX1013, [0001]; EX2010 [0032], [0036]. Baca, by contrast, is directed to mounting those same devices to stationary surfaces. EX1006, [0003], [0004]. A PHOSITA looking for attachment solutions for a smartphone wallet accessory would naturally look to references directed to smartphone accessory attachment — placing Levy squarely in the relevant field of prior art.

280. Same attachment philosophy — simple magnetic attraction. Berkley's alternative magnet attachment describes a magnet on the base of the compact that enables it to "stick" to corresponding magnets attached to a smartphone — simple

magnetic attraction between a magnet on the wallet and corresponding magnets on the phone, with no alternating polarity arrays, no self-alignment function, and no specification of magnet grade or field strength. EX1013, [0029]. Levy's magnets function in precisely the same way — requiring only compressive force to hold the case against the mount face. EX2010, [0040]. Neither Berkley's magnet nor Levy's magnets require rare earth grades, neither specifies a minimum field strength, and neither discloses alternating polarity arrays for orientation control. The two references share a common, low-field-strength magnetic attachment philosophy that is directly compatible with a credit card wallet application as it does not introduce added cost or risk.

281. Interface plate enables attachment to any phone. Levy discloses an interface plate embodiment that "is configured to be attached to the rear surface of a personal electronic device or to the rear surface of a case in which the personal electronic device is already received" via adhesive — enabling Levy's mechanical alignment system to work with any existing phone or phone case without requiring a custom-designed case. *Id*., [0065], [0066], FIG. 11. This is directly compatible with Berkley's case attachment philosophy, which similarly contemplates attachment "to a protective skin or case covering the handheld device" rather than

requiring a custom case. EX1013, [0027]. A PHOSITA would recognize that Levy's interface plate can serve as the phone-side component of a Berkley + Levy combination, enabling Levy's mechanical alignment features to work with Berkley's wallet without a system redesign. The fact that Berkley's inventor explicitly contemplated case-based attachment — the exact architecture Levy employs — confirms that a PHOSITA reading both references would immediately recognize their compatibility and would find motivation to combine them in a Berkley + Levy configuration.

iii. Levy's Approach Is Superior to Baca's for Berkley's Use Case on Every Relevant Metric

282. A PHOSITA comparing Levy's mechanical alignment approach to Baca's rare earth array approach for the specific purpose of adding orientation control to Berkley's wallet would find that Levy's approach is superior on every metric relevant to Berkley's use case. This comparative analysis reinforces the conclusion that a PHOSITA exercising ordinary skill would choose Levy's approach over Baca's, and would not import Baca's expensive and card-corrupting rare earth magnetic array into Berkley's design when Levy's superior alternative is available.

283. **Card safety**. Levy's mechanical alignment approach achieves orientation control and superior shear resistance through physical protrusion-in-recess geometry, requiring no increase in magnetic field strength beyond what Berkley's existing simple magnet attachment already provides. Because the field strengths involved in a Berkley and Levy combination do not approach the damage threshold for credit card magnetic stripes, no ferromagnetic shield is required and the card corruption problem that Baca's rare earth magnetic arrays create does not arise. Baca's approach, by contrast, introduces rare earth magnetic arrays whose field strengths substantially exceed the card damage threshold, requiring a ferromagnetic shield as a necessary additional component of the design package. A PHOSITA would have understood that on the metric of card safety, Levy's approach is unambiguously superior — it provides orientation control without creating the card corruption problem that Baca's approach creates and that requires a ferromagnetic shield to solve.

284. **Cost**. Levy's protrusion and recess features are molded into the housing components of the case and mount as geometric features of those components, adding minimal material cost and minimal manufacturing cost to the overall design, (see Section III.D.e for more details). Levy's magnets, which

provide simple compressive attachment force without rare earth grade requirements, are low-cost commodity components consistent with the cost structure of Berkley's existing design. Baca's approach requires arrays of N48+ neodymium rare earth magnets on the wallet side of the combination, at a per-unit magnet cost orders of magnitude greater than Berkley's existing attachment, plus the additional cost of a ferromagnetic shield and its associated manufacturing integration as discussed in the preceding section. A PHOSITA would have understood that on the metric of cost, Levy's approach is unambiguously superior for a cost-sensitive consumer wallet product.

285. **Complexity**. Levy's mechanical alignment interface is a single molded or machined geometric feature, a protrusion with tabs mating with a recess with cut-outs, that can be integrated into the wallet and phone-side components without requiring precise magnetic engineering, rare earth magnet sourcing, alternating polarity array design, pole pattern coordination between wallet-side and phone-side components, or ferromagnetic shield integration. Baca's approach requires all of these engineering steps, each of which adds design complexity and manufacturing difficulty. A PHOSITA would have understood that on the metric of

engineering and manufacturing complexity, Levy's approach is substantially simpler than Baca's approach for Berkley's use case.

286. **Thickness**. Levy's protrusion and recess features are recessed into and raised from the surfaces of the existing housing components, adding no meaningful thickness to the overall device profile, the protrusion on the phone side fits within the recess on the wallet side when coupled, adding no net thickness to the combined device. Baca's approach requires additional rare earth magnet array layers on the wallet body plus a ferromagnetic shield layer, each of which adds measurable thickness to the combined device in a direction directly contrary to Berkley's explicit design goal of minimizing bulk and adding minimal thickness to the handheld device. EX1013, [0025], [0026]. A PHOSITA would have understood that on the metric of form factor impact, Levy's approach is superior to Baca's approach for a design in which minimizing thickness is an explicit stated objective.

287. **Strength**: A person of ordinary skill in the art with experience in magnet-containing consumer product design would immediately understand a fundamental and unavoidable physical limitation of using permanent magnets to resist the force of gravity in a vertical mounting application: the shear force that a magnet provides — the force resisting lateral or vertical sliding parallel to the

magnet face — is substantially lower than the pull force that the same magnet provides in the direction perpendicular to its face. Those skilled in the art would have understood that permanent magnets generally provide a shear force of approximately one-half to just over one-half of their rated pull force. EX2019. This relationship between pull force and shear force is a fundamental characteristic of permanent magnet attachment systems that a PHOSITA would factor into any design analysis involving magnets used to resist gravity.

288. The practical consequence of this relationship is significant. An object weighing ten ounces mounted on a vertical surface using permanent magnets requires a magnet with a pull force of at least approximately twenty ounces to resist gravity through shear force alone. If that same object is subject to dynamic acceleration forces, as would occur in a vehicular mounting application, where acceleration forces of 2G or greater in the downward direction are not uncommon during braking or over road irregularities, the effective weight of the object increases proportionally. At 2G downward acceleration, an object behaves as though it weighs three times its static weight, (its weight 1G plus 2Gs from the dynamic acceleration), requiring magnetic pull force of six times the object's static weight to maintain attachment through shear resistance alone.

289. As of the September 2018 priority date of the '641 patent, the Apple iPhone 8 Plus, one of the most widely used smartphones at that time, weighed approximately 7.1 ounces. EX2023. Applying the shear force relationship to a vehicular mounting application for a device of this weight at 2G dynamic acceleration: the device acts as a stationary object three times its actual weight, requiring a magnetic pull force of at least six times its static weight — approximately 42.6 ounces, or almost three pounds, to maintain reliable attachment through shear resistance alone during vehicular use. This is precisely why Baca specifies N48 minimum and N52 preferred neodymium rare earth magnets. These are the only magnets at those grade levels can provide the field strengths necessary in a low-profile attachment format suitable for a smartphone dashboard mount.

290. The wallet-on-phone application that Berkley discloses is categorically different from Baca's vehicular mounting application in its force requirements, and a PHOSITA would recognize this difference immediately. Berkley's wallet is a lightweight accessory, a thin card holder containing a few credit cards and perhaps some cash, carried in the user's hand or pocket rather than mounted on a vertical surface subject to vehicular dynamic forces. The force required to hold Berkley's wallet against the back of a smartphone in a hand-carried,

pocket-carried application is modest: the wallet must resist gravity in the pull-off direction and resist modest shear forces during pocket insertion and removal. These are forces measured in ounces, not pounds, and they do not require the high-grade rare earth magnets that Baca specifies for the vehicular mounting application.

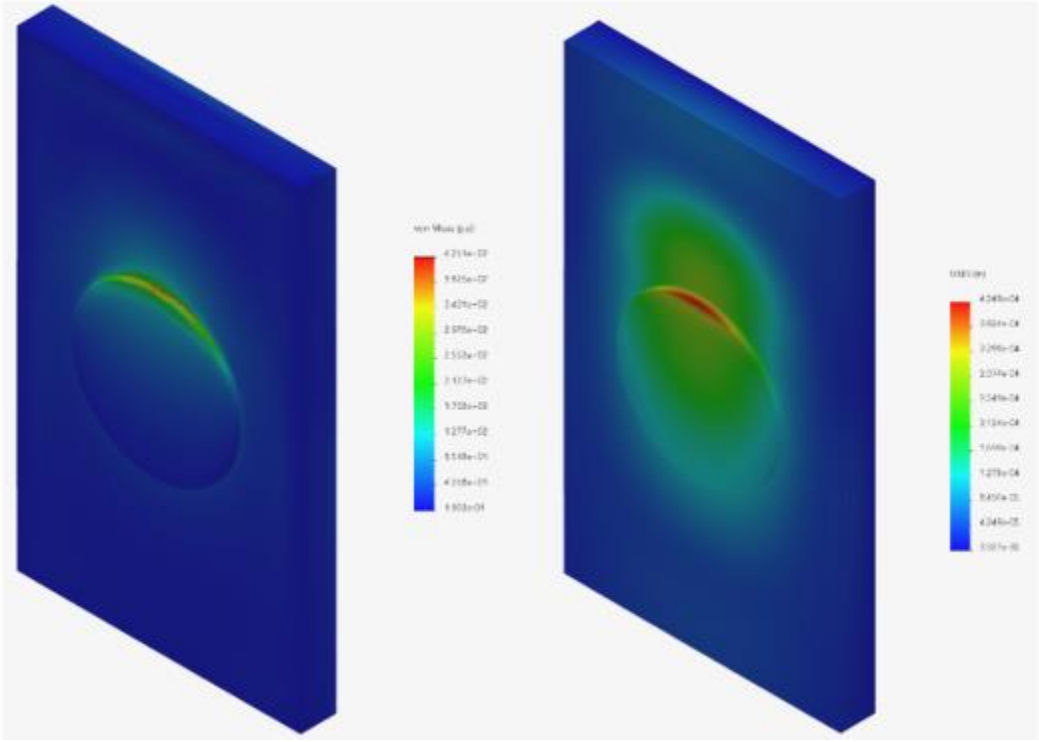
291. A PHOSITA evaluating the force requirements for the wallet-on-phone application would conclude that Baca's N48+ neodymium rare earth arrays are massively over-engineered for this application, designed to provide 43 ounces of pull force for a use case that requires only a few ounces. Importing Baca's over-engineered, expensive, and card-corrupting magnetic system into the wallet-on-phone application is not a sensible engineering choice when the force requirements of the application are a small fraction of what Baca's system provides and when the side effects of Baca's high field strengths, specifically the corruption of the credit card magnetic stripes that Berkley is designed to carry, are severe and foreseeable.

292. Levy's mechanical protrusion-and-recess system eliminates the fundamental tradeoff between shear resistance and removal force that afflicts any purely magnetic attachment approach. It does so by separating the two functions between two different structural mechanisms: the mechanical protrusion-and-recess resists shear forces mechanically, with performance limited only by the strength of

the structural material, while the small magnets required in a Levy-type system provide only pull-off retention force, the modest force needed to hold the protrusion seated in the recess, without bearing any responsibility for resisting gravity through shear.

293. Even though I already knew the answer as it would be obvious to any PHOSITA, I wanted to quantify the mechanical performance of Levy's approach and confirm that it provides adequate shear resistance for the wallet-on-phone application using only modest structural features. To do so, I conducted a Finite Element Analysis using SolidWorks 2025 with Simulation Premium, a widely used professional solid modeling and FEA simulation software used by those skilled in the art for applications involving consumer electronics, automotive, aerospace, and other industries. The model analyzed was a 3-inch by 5-inch mount incorporating a protrusion measuring 1.75 inches in width and 0.062 inches in depth, that is, a protrusion of only 1/16 of an inch, fabricated from ABS plastic. ABS is one of the most widely used thermoplastic materials in consumer electronics and automotive interior applications as it is not an expensive plastic, is available in impact resistant varieties, and it's one of the few plastics that can be chrome plated.

294. The figures below show the stress distribution and deformation results from the FEA under a 20-pound downward force applied to the mount.



295. The results are unambiguous. Under 20 pounds of downward force, a force approximately forty times greater than the heaviest foreseeable static load from a loaded wallet in a hand-carried application, the ABS protrusion deformed less than 0.001 inches and the stress on the material was negligible, well below ABS's yield strength. Even at 100 pounds of downward force, the protrusion-and-recess system performs within acceptable stress and deformation limits. These results confirm what engineering analysis predicts: Levy's simple mechanical

protrusion-and-recess, fabricated in inexpensive commodity ABS plastic at a protrusion depth of only 1/16 of an inch, provides shear resistance in the hundreds of pounds, performance that is orders of magnitude greater than any foreseeable force requirement in the wallet-on-phone application.

296. The critical engineering insight these results establish for those skilled in the art is that in Levy's system, the magnets need only provide the modest pull-off force required to keep the protrusion seated in the recess, a force of a few ounces, achievable with simple, inexpensive, low-grade permanent magnets that produce no meaningful magnetic field at card-proximity distances. The protrusion-and-recess does all of the mechanical work of resisting gravity and shear forces. As a result, Levy's system simultaneously achieves far superior shear resistance compared to any magnetic approach, requires far less removal force because the magnets are small and weak, poses no card corruption risk because the magnets are low-grade, and costs far less because neither rare earth magnets nor ferromagnetic shielding is required.

297. The engineering analysis above establishes that a person of ordinary skill in the art with product development experience would reach through independent analysis before the priority date of the ‘641 Patent. The conclusion is

this: for a hand-carried wallet-on-phone application such as Berkley's wallet in which the force requirements are modest, card corruption is a critical failure mode, cost is a primary design constraint, and user convenience requires easy removal, Levy's mechanical protrusion-and-recess approach combined with small, low-grade magnets is objectively superior to Baca's rare earth magnetic array approach on every engineering metric that matters.

e. Petitioner and Its Expert Identify No Genuine Motivation to Combine Berkley and Baca

298. Dr. Phinney argues that a PHOSITA would have been motivated to combine Berkley with Baca because Baca provides implementation details for using magnets to attach a wallet of the type Berkley discloses to a phone or phone case. Dr. Phinney's declaration identifies Baca's magnetic attachment mechanics purportedly as available for use in a Berkley-type wallet but does not address the affirmative reasons why a PHOSITA would make that modification, particularly in light of the many reasons (discussed above) why a PHOSITA would not modify Berkley according to the teachings of Baca. As explained above, those affirmative reasons are substantial and numerous: the card corruption risk that Baca's rare earth arrays create when placed adjacent to the credit card magnetic stripes that Berkley is specifically designed to carry and protect; the substantial cost differential

between Baca's magnetic array system and Berkley's existing low-cost attachment mechanism; the manufacturing complexity that the full modification package requires; the adequacy of Berkley's existing attachment mechanisms for the wallet-on-phone application that Berkley itself addresses; the teaching away effect of Baca's own cost-reduction guidance, which directs a PHOSITA away from using multiple full rare earth arrays; and the availability of Levy's mechanical alignment approach as a superior alternative to Baca's magnetic arrays and one that achieves orientation control without any of the costs and corruption risks that adding arrays of magnets that Baca teaches.

299. Dr. Phinney separately argues, without any basis, that the combination yields a predictable result, which he contends independently supports the motivation to combine. I disagree. A PHOSITA would not have expected a reasonable expectation of success in achieving the claimed invention — by combining the rare earth magnetic arrays of Baca with Berkley's wallet. The combination yields a wallet that would have an unacceptably high risk of corrupting the magnetic cards it is designed to carry, and the only thing about this approach that would be predictable to is the added cost. As Petitioner and its expert recognize, the risk of corrupting is so high that they separately contend that the

Berkley and Baca combination requires further modifications to protect Berkley's magnetic cards from Baca's rare earth magnetic arrays. Thus, those skilled in the art would have known that this combination would not work without further additional modifications to the combination.

f. The Claimed Invention Is Not Obvious

300. The non-obviousness of the '641 Patent's claimed invention is shown by recognizing what the prior art combination Petitioner proposes actually produces: not a solution to the problem of magnetically coupling a credit card wallet to a smartphone with orientation control, but rather a new and serious problem that the prior art combination itself creates and does not solve. The combination of Berkley's credit card wallet with Baca's rare earth magnetic arrays does not yield a functionally improved product. It yields a device that corrupts the credit cards it is designed to carry, rendering it non-functional for its primary purpose while increasing the cost and complexity of manufacture.

301. The '641 Patent's inventors recognized this problem and invented a specific integrated architecture that solves it. That recognition, and the inventive solution it produced, is itself evidence of non-obviousness. I understand that identifying a problem in the prior art and inventing a solution that the prior art does not teach or suggest is evidence of non-obvious contribution. The inventors did not

simply combine known elements in a predictable way to yield a predictable result. They identified that the use of magnetic arrays to attach a wallet provides orientation control but creates a card corruption problem. They recognized that the solution to that problem requires a specific integrated design and invented the specific dual-array-with-shield design that simultaneously achieves magnetic orientation control and protects the card compartment from the fields the dual arrays produce. A PHOSITA working from the prior art without hindsight knowledge of the inventors' solution would encounter the card corruption problem as an obstacle and immediately would have understood that it teaches away from the combination, not as a stepping stone that leads naturally to the claimed architecture. The path from the prior art to the claimed invention required inventive insight that the prior art does not supply.

302. The ‘641 Patent's inventive contribution cannot be understood by examining its individual components in isolation as the Petitioner has done or attempting to apply a sequential/serial approach to obviousness. The contribution is not the dual separated array architecture alone, nor the ferromagnetic shield alone, nor the wallet body alone. The contribution is the specific integrated combination of all three elements, each in its specific structural configuration and each performing

its specific functional role within the integrated architecture, that together produce a result that none of the individual elements produces alone and that no obvious combination of prior art references teaches or suggests.

B. A PHOSITA Would Not Have Been Motivated to Apply Goto's Shield to the Folios of Zhu and Kinshi

303. Petitioner's grounds relying on combinations of Zhu, Kinshi, and Goto share a common and fatal flaw: the ferromagnetic shielding that Goto discloses is geometrically incompatible with the open-topped pocket architecture that both Zhu and Kinshi employ. As explained above (Section III.C), effective ferromagnetic shielding requires that the shield is fully interposed between the field source and the protected object with no bypass path. As explained, any exposure of any portion of a credit card's magnetic strip to a corrupting magnetic field renders the entire card non-functional. When these two principles are applied to the specific geometry of Zhu and Kinshi's open-topped pocket designs, the result is unambiguous: Goto's shielding cannot achieve its only stated motivation for combining them with Zhu and Kinshi, *i.e.,* to protect the stored magnetic cards. A PHOSITA who would have understood the physics of ferromagnetic shielding and the all-or-nothing corruption behavior of magnetic strips would have recognized this geometric incompatibility before making the combination, and would therefore have no motivation to incur

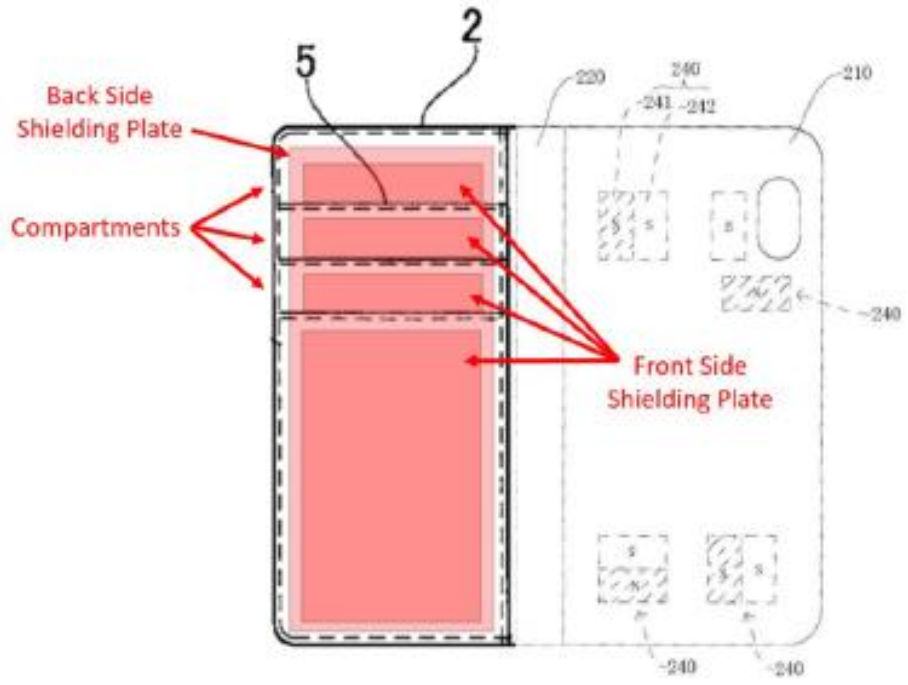
the cost and manufacturing complexity that adding Goto's shield requires because there is no benefit to doing so.

a. The Geometry of Zhu and Kinshi's Open-Top Pockets

304. The starting point for the geometric analysis is the physical relationship between the open-topped pocket architecture of Zhu and Kinshi and the standard dimensions of a credit card's magnetic stripe. Kinshi's pockets 5 are open-topped sleeves specifically designed for vertical card insertion and removal. Kinshi's specification states that "openings of the pockets 5 are formed in a direction along the horizontal direction to allow cards to be slid in and out in the vertical direction." EX1010, [0015]. This design necessarily means that the top edge of each card protrudes above the pocket opening when the card is fully inserted — cards are not enclosed within the pocket but are retained by the sleeve walls below while their upper portions remain exposed above the opening. Petitioner's own expert Dr. Phinney confirms this geometry through the commercial folio wallet images he includes in his declaration, including the Burkley case image at page 41 of his declaration and the commercial folio images at pages 197 through 198 of the Phinney declaration (excerpt shown below), all of which show cards visibly protruding well above the pocket openings in commercial folio wallet products of the type Kinshi discloses.



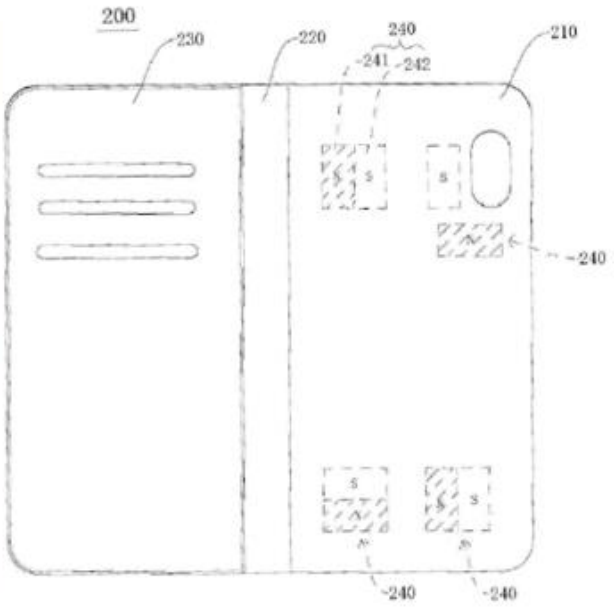
305. The same analysis applies to Zhu's panel 230 as modified by Petitioner's proposed combination, as shown in Dr. Phinney's own Figure G at page 195 of his declaration (copied below).



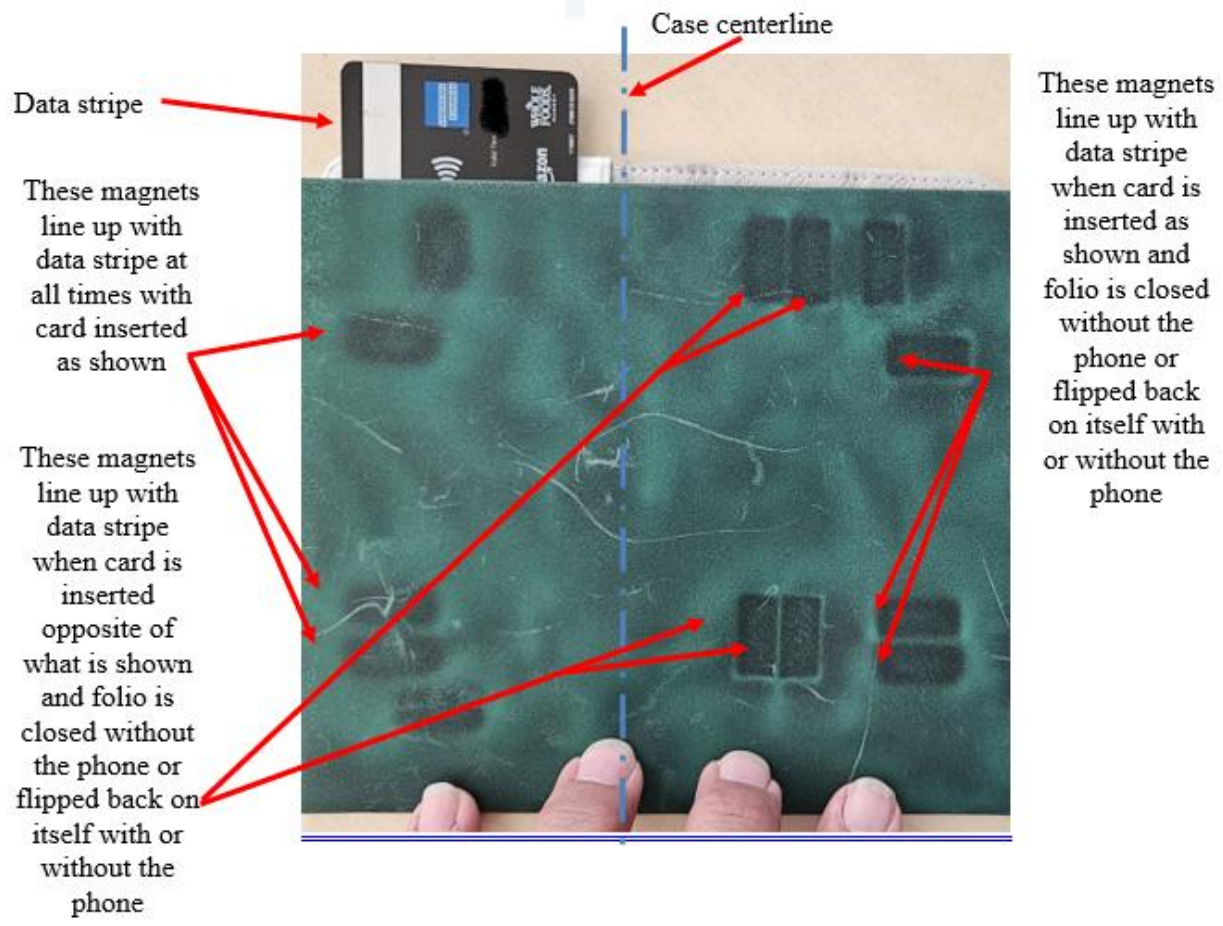
306. The critical dimension in this geometric analysis is the location of the magnetic stripe on a standard credit card. ISO/IEC 7811 locates the magnetic stripe on the reverse surface of the card beginning approximately 5 mm from the top edge of the card, and the encoded data starts at approximately 7.5mm from the end of the card. A standard ISO/IEC 7810 ID-1 credit card measures 85.6 mm in height by 54 mm in width. The magnetic stripe therefore runs across the full width of the card beginning approximately 5 mm from the top edge. As illustrated above in Dr. Phinney's image, in Kinshi's open-topped pocket geometry, the upper portion of the card that protrudes above the pocket opening includes the top edge and the region immediately below it — the region that includes the magnetic stripe. The magnetic stripe location, beginning approximately 5 mm from the top of the card, falls within the protruding, unshielded portion of the card in Kinshi's pocket design. Any shielding material incorporated into the front and rear walls of the pocket, which necessarily terminate below the pocket opening to allow card insertion and removal, cannot extend to cover the portion of the strip that protrudes above the opening. The exposed stripe portion is not a marginal sliver at the very top edge of the card — it is a significant portion of the stripe itself, positioned precisely at the location that Kinshi's open-topped geometry leaves unshielded.

307. The image below on the left is the same folio shown in Dr. Phinney's report, Zover, with the only difference being that it is white leather not brown. The image on the right is from Zhu.

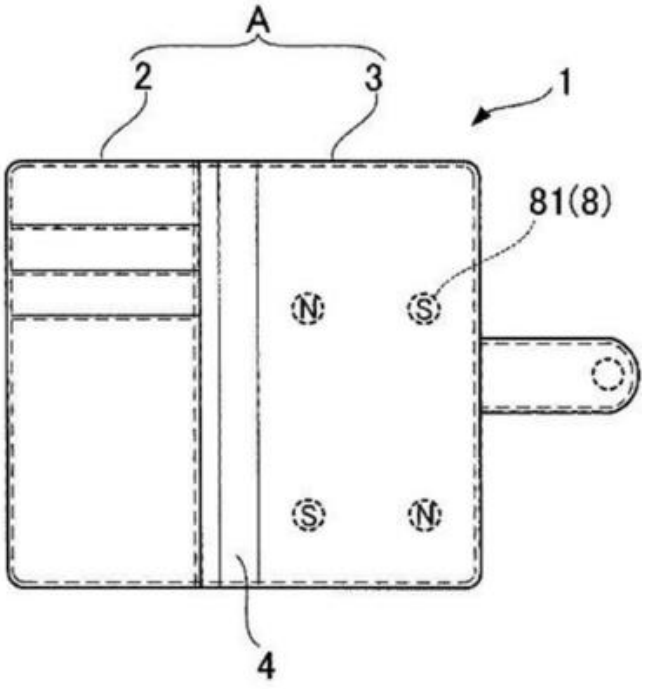




308. It is readily apparent that the phone side panel on the Zover case is virtually identical in layout to what Zhu teaches. In addition, Zover adds five additional magnets to credit card side of the case. This means that in the real world a manufacturer took Zhu's teachings and created a folio style case based off of that along with additional improvements they deemed financially prudent, that is, the additional functionality offset the additional cost. It is clear from the image below that the Zover case does not protect the cards from magnetic field corruption.


Case centerline
Data stripe
These magnets line up with data stripe at all times with card inserted as shown
These magnets line up with data stripe when card is inserted opposite of what is shown and folio is closed without the phone or flipped back on itself with or without the phone
These magnets line up with data stripe when card is inserted as shown and folio is closed without the phone or flipped back on itself with or without the phone

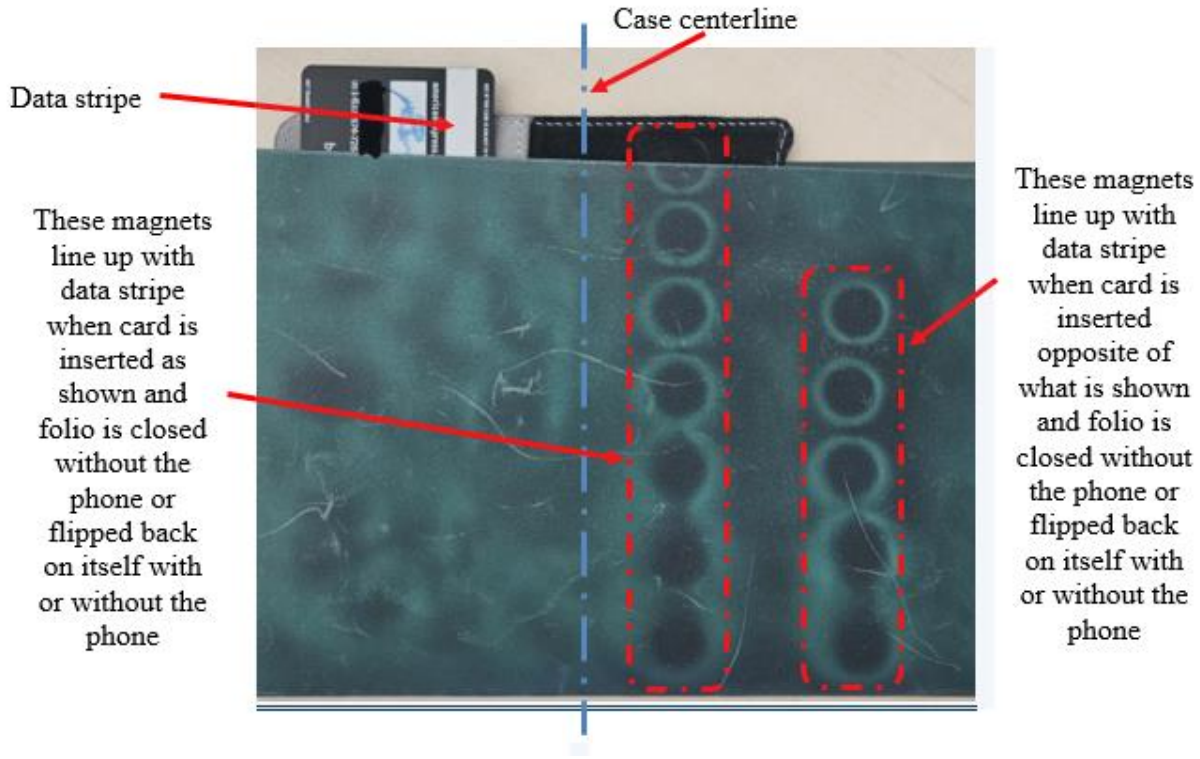




309. The same is true with Kinshi. The image below is of another folio style wallet that Phinney discloses made by Burkley, and next to it is an image from Kinshi.

310. It is readily apparent that the phone side panel on the Burkley case has an array of magnets similar to Kinshi along with a closer flap with a magnet in it. In this case Burkley decided to additional magnets to phone side of the case as they deemed it necessary to hold the phone securely in the case. This means that in the real world a manufacturer took Kinshi's teachings and created a folio style case based off of that along with additional improvements they deemed financially prudent, that is, the additional functionality offset the additional cost. It is clear

from the image below that the Burkley case does not protect the cards from magnetic field corruption.



311. The images below on the left is a folio made by Zover and the image on the right is a second folio style case that is made by Burkley. These cases are similar to Zhu and Kinshi respectively as shown above.



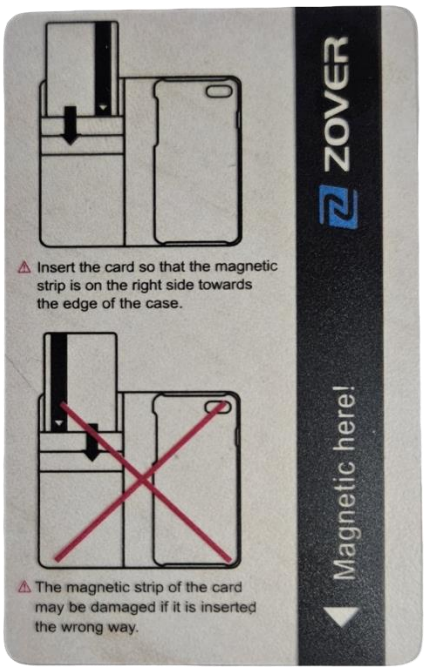


312. In both instances the credit card shown was inserted as far as it would go into card slot and it is clear that in both instances part of the encoded track remains exposed. Folio style cases are designed so that a certain amount of the card remains exposed so that the cards can be easily removed when needed. The amount of the card that remains outside of the pocket is determined by the specific manufacturer. What is clear is that both of these manufacturers decided that they needed to leave between 15mm and 22.5mm of the card exposed which means that

the between 7.5mm and 15mm of the encoded tracks will be outside of the card slot thus exposing card stripe data to being damaged by the magnets in the folio style case.

313. This issue of card damage was well known to magnetic folio case manufacturers at least as far back as 2017 as the Zover folio had an inspection certificate that came along with the folio case with a 2017 date stamp. The Kinshi style folio that is made by Zover and referenced by Dr. Phinney is shown below on the left with Zover's warning card as they shipped it, (the warning card was inserted into one of the slots as shown below). The warning card shows that the manufacturer was aware that cards could be damaged by folio style magnetic cases.





314. The warning card first shows a picture of a card with its magnetic stripe on the right side as the correct way to insert a card with the text underneath it stating, “Insert the card so that the magnetic strip is on the right side towards the edge of the case.” Then below that is a crossed-out image of a card with its stripe on the left side of the slot with text underneath it stating, “The magnetic strip of the card may be damaged if it is inserted the wrong way.”

315. A PHOSITA would have reasonably inferred from this that the manufacturer knew of the issue of the magnets potentially corrupting the magnetic stripes on the cards and felt that the only commercially reasonable solution to the issue was to warn the end user rather than add a shield as Dr. Phinney proposes. .

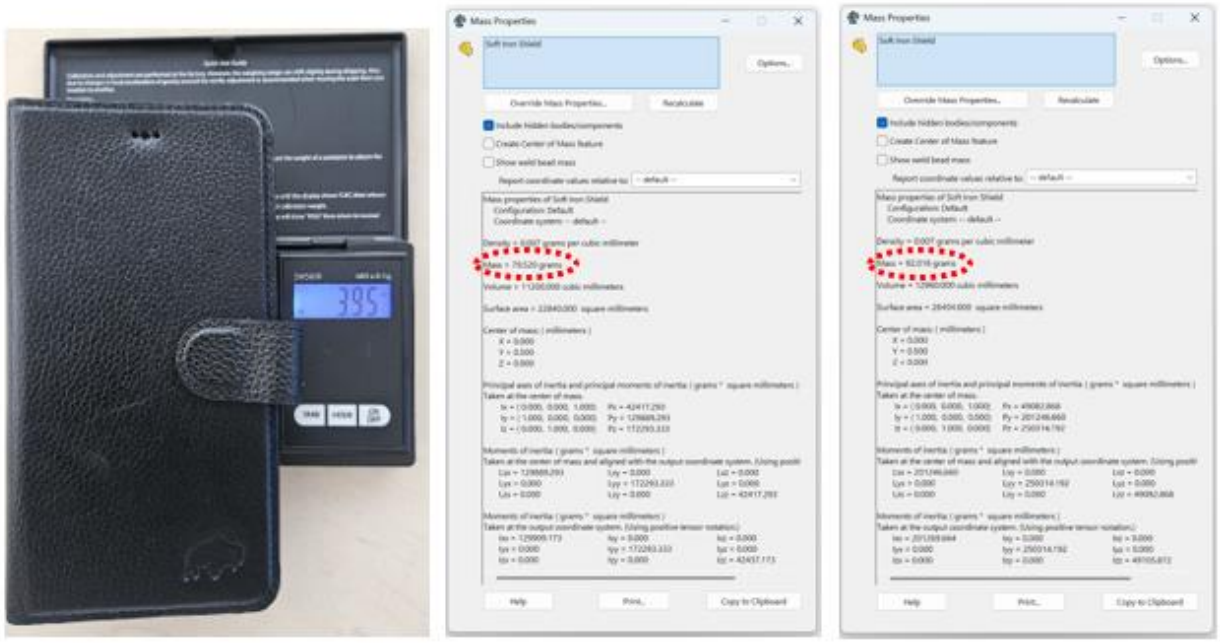
316. It also reasonable to infer from this manufacturer’s approach of providing only a warning card that adding a shield as Dr. Phinney proposes was not an obvious solution. As I have explained, in addition to adding cost and manufacturing complexity, the proposed modification would not have worked for its intended purpose of shielding the magnetic stripes on the cards that are exposed via the open-topped sleeves where they are intended to be kept.

b. Adding Goto's Shield to Zhu and Kinshi Adds Significant Weight to the Folio

317. Petitioner's expert has stated that a PHOSITA would see that applying Goto to Zhu and Kinshi would be obvious. What is actually true is the opposite of that. A PHOSITA would understand the magnitude of the shielding that would be needed to safely allow Baca's powerful magnets (*e.g.*, rare earth Neos) to be added to Zhu and Kinshi. A material such as Mu-metal has a high permeability but only works at lows gauss levels and Nickel alloys are extremely expensive. At higher gauss levels a PHOSITA would know that something like pure soft iron would be needed. The amount size and thickness of ductile pure iron needed to shield Baca's magnets from would require 150% or more increase in weight of the phone case that Kinshi teaches. Dr. Phinney states that a PHOSITA would simply apply shielding to the front and back of the folio style wallet to get the necessary magnetic shielding needed to protect cards from damage. In reality, that is not the case and a PHOSITA would recognize that immediately.

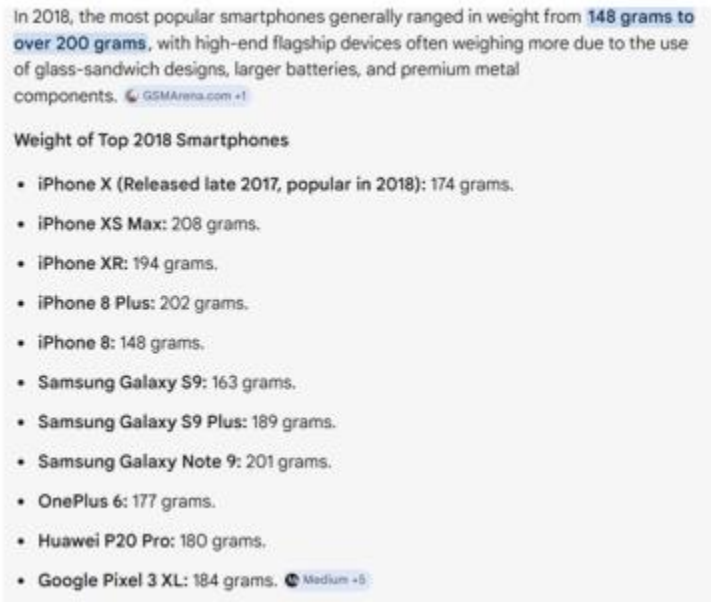
318. To protect against ordinary NdFeB magnets, Neos, between 3 and 5 mm of soft iron would be needed, according to Courage Magnet, (a company well known to those skilled in the art as a supplier of magnetic products). EX2022. Measuring one of the folio style wallets that Dr. Phinney put forth the back shield

would need to be 162mm x 80mm and the front shielding would need to be at least 140mm x 80mm. Even if you ignore the recommendations made by Courage Magnets and only go with a 1mm thick plate, then the weight of Burkley's case increases by 152%. The images below show Burkley's case on a scale, and the mass properties of the two 1mm shielding plates mentioned above.



319. As shown above, Burkley's case weighs 3.95 ounces. The two plates weigh 79.5g and 92g which together weigh just over 6 ounces, (171.5g). This translates into a 152% increase in the weight of the case. Those skilled in the art would have understood that this increase in weight will have negative impact on sales. For example, smart phone manufacturers constantly are cognizant of the

threshold for smart phone weight. Batteries account for 20%-30% of a smart phones wight and there is an inherent trade off there. As batteries get bigger, time between charges increases which is a major selling point for any phone; however, at a certain point the phone gets too heavy. In 2018 the average weight for the most popular smart phones was 184g with the heaviest coming in at 208g. EX2023. A PHOSITA would have understood that means that about 200g appears to be about the maximum that manufacturers have decided a phone should weigh. This means that adding 172g of shielding almost doubles the weight of the phone that people are carrying, and in the end provides no benefit to the customer as part of the encoded data stripe on the cards that are supposed to be shielded are always exposed at some time during normal use to damaging magnetic fields such as when the phone is removed and the folio is closed.



In 2018, the most popular smartphones generally ranged in weight from **148 grams to over 200 grams**, with high-end flagship devices often weighing more due to the use of glass-sandwich designs, larger batteries, and premium metal components.

Weight of Top 2018 Smartphones

- **iPhone X (Released late 2017, popular in 2018):** 174 grams.
- **iPhone XS Max:** 208 grams.
- **iPhone XR:** 194 grams.
- **iPhone 8 Plus:** 202 grams.
- **iPhone 8:** 148 grams.
- **Samsung Galaxy S9:** 163 grams.
- **Samsung Galaxy S9 Plus:** 189 grams.
- **Samsung Galaxy Note 9:** 201 grams.
- **OnePlus 6:** 177 grams.
- **Huawei P20 Pro:** 180 grams.
- **Google Pixel 3 XL:** 184 grams.

c. The Sole Rational Basis for Adding Goto's Shield Is Card Protection — And That Purpose Cannot Be Achieved

320. Before analyzing the specific failure modes of the proposed combination in each operating configuration, it is important to establish what purpose Goto's shield serves in Petitioner's proposed combination and why the inability to achieve that purpose eliminates the motivation to combine entirely.

321. Goto's ferromagnetic shield serves one purpose in the proposed combination: protecting the magnetically encoded data on the credit cards from corruption by the magnetic fields produced by the magnets in Zhu's back plate 210 or Kinshi's base piece 3. Dr. Phinney's stated motivation for combining Goto with Zhu and Kinshi confirms this. Dr. Phinney identifies card protection as the

motivation for the combination in connection with two specific operating scenarios that he identifies. EX1003, [273-277] (Zhu/Kinshi/Goto combination); *id.*, [393-397] (Kinshi/Goto combination). No other benefit is attributed to the shield in Petitioner's combination theory. The shield adds cost in the form of ferromagnetic shielding material. It adds manufacturing complexity in the form of additional process steps to integrate the shield into the cover piece walls. It adds no aesthetic benefit, no structural benefit, and no functional benefit other than the card protection that Petitioner identifies as its sole purpose. Notably, Dr. Phinney did not consider whether modifying Zhu or Kinshi to include Goto's shield would add cost, manufacturing complexity, thickness and weight. EX2021, 63-64.

322. A PHOSITA would not add cost and manufacturing complexity to a consumer product for zero benefit. Where the only stated purpose of a proposed modification cannot be achieved in the geometric context in which the modification is proposed, the motivation to make that modification evaporates entirely. As explained below, Goto's shielding cannot achieve its only stated purpose — card protection — in the normal operating configurations of the Zhu and Kinshi folio designs, because the open-topped pocket geometry creates bypass paths that defeat the shielding mechanism in the operating configurations Petitioner identifies. When

operating configurations exist in which the combination fails to achieve its intended purpose, a PHOSITA would have recognized this issue before making the combination that it is geometrically futile — and a PHOSITA would not have incurred the cost and manufacturing complexity to make a modification known in advance to be futile.

d. The Shield Fails in the Folio-Closed Position (Scenario A) — The Most Basic Operating Configuration

i. Dr. Phinney's Own Figure Reveals the Geometric Failure

323. The geometric failure of the proposed combination in the folio-closed position is demonstrated by Petitioner's own expert's figure. Dr. Phinney's Figure G at page 195 of his declaration depicts the proposed combination of Zhu or Kinshi with Goto's shielding, showing Front Side and Back Side Shielding Plates as rectangles within the walls of the cover piece. As Figure G reveals, the shielding plates are depicted as terminating below the pocket openings. This is not a drafting choice or an omission — it is a geometric necessity. The pocket openings must remain open at the top to allow card insertion and removal. Shielding material cannot be placed at or above the pocket opening without physically blocking the opening and preventing cards from being inserted or removed. The shielding plates therefore cannot extend to the top of the cover piece, and by geometric necessity

they cannot cover the portion of the card that protrudes above the pocket opening — the precise portion of the card where the magnetic strip is located. Dr. Phinney confirmed that this portion of the pocket would be exposed or uncovered after adding the proposed modification to add shielding plates. EX2021, 75.

324. In the folio-closed position, the cover piece folds against the back plate of Zhu or the base piece of Kinshi, bringing the card pockets into proximity with the magnets in those components. The magnetic stripe, located beginning approximately 5 mm from the top of the card, falls within the protruding, unshielded zone above the shielding plate as Figure G itself confirms. The exposed portion of the stripe is in direct proximity to the magnets through an unshielded air path — there is no shielding material between the magnet groups and the protruding upper portion of the card in the folio-closed configuration.

ii. Application of the Governing Physical Principle

325. The governing physical principle established above and known to PHOSITA applies directly and unambiguously to this geometry. The exposed stripe portion, however small it may be in absolute terms, is subject to the magnetic fields produced by Zhu's magnet groups 240 or Kinshi's base piece 3 magnets in the folio-closed position, because those fields reach the exposed strip through an unshielded air bypass path that the Front Side Shielding Plate cannot cover. As explained

above, any exposure of any portion of the magnetic stripe to a field exceeding the damage threshold renders the entire encoded data sequence on that track unreadable and the card entirely non-functional. There is no partial corruption that leaves the card operational, and there is no threshold of exposed area below which stripe exposure is tolerable.

iii. This Alone Defeats the Motivation to Combine

326. The folio-closed position is not an unlikely operating configuration. It is an ordinary, everyday operating condition of a folio phone case: the user removes the phone from the phone side panel, closes the case to keep the contents secure while completing their task, completes their task, opens the wallet and places the phone back onto the phone side panel. During the time that the phone is removed and the wallet is closed to keep the contents secure, the card stripes are directly affected magnet regardless of Dr. Phinney's suggested shielding. Any part of the card that is not below the slot line will always be exposed to the magnetic fields.

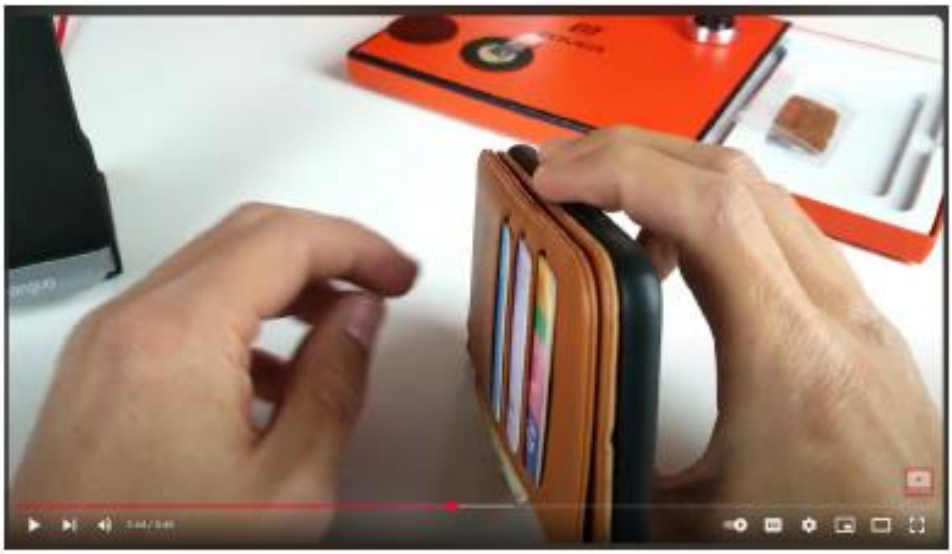
327. Dr. Phinney identifies this as one of the two primary operating scenarios in his motivation analysis. EX1003, [273-277]; EX2021, 65-66. A PHOSITA who understood the physics of ferromagnetic shielding and the all-or-nothing corruption behavior of magnetic stripes would recognize, before making the combination, that the proposed modification cannot achieve its only stated

purpose of protecting the magnetic cards in this baseline operating configuration. Thus, a PHOSITA would have reasonably concluded there is no reasonable expectation of success. The geometric constraints of the open-topped pocket architecture establish the futility of the combination before it is attempted. A PHOSITA would not have incurred cost and manufacturing complexity to make a modification known in advance to provide zero protective benefit in a common operating configuration of the device.

e. The Shield Also Fails When the Folio Is Folded Back (Scenario B) — Confirming No Operating Configuration Exists in Which the Combination Works

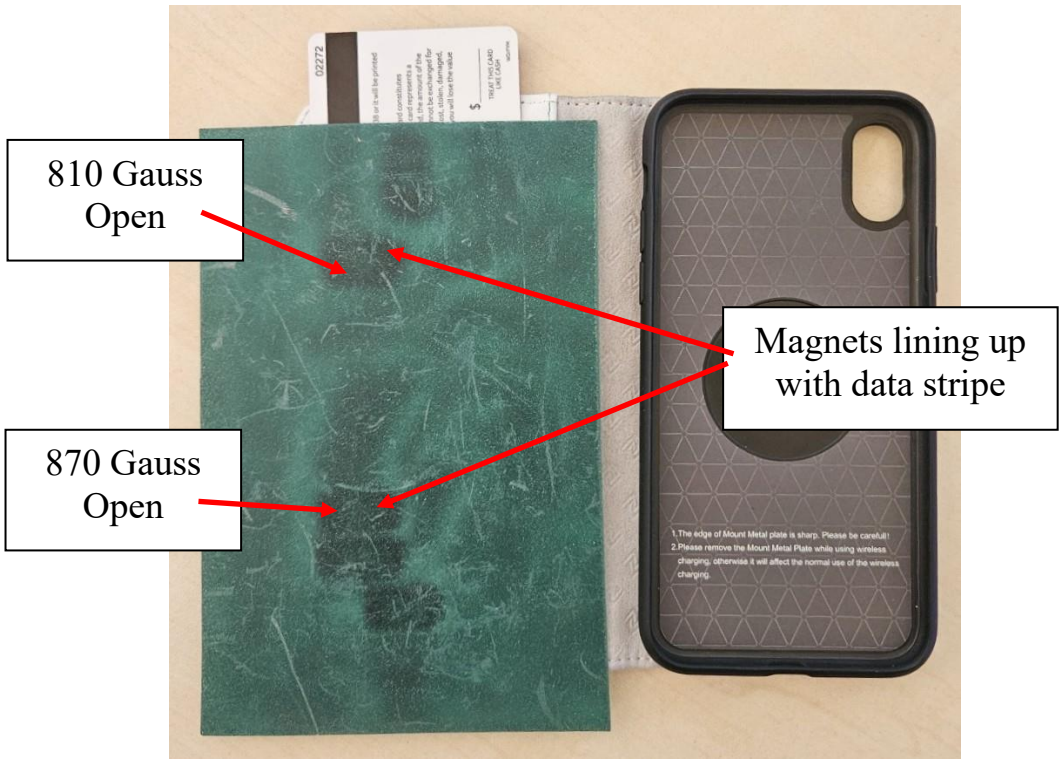
i. The Folded-Back Position Brings Exposed Stripe Portions Into Proximity With the Phone Side Panel Magnets

328. As shown below, the second operating configuration Petitioner's expert identifies is the folio-folded-back position, in which the cover piece is folded approximately 180 degrees away from the phone, placing the cover piece against the back surface of the phone assembly with the card pockets accessible and facing outward. EX1003, ¶ 298. Dr. Phinney identifies this as the second of the two primary operating scenarios in his motivation analysis. EX1003, [273-277]; EX2021, 69-70.

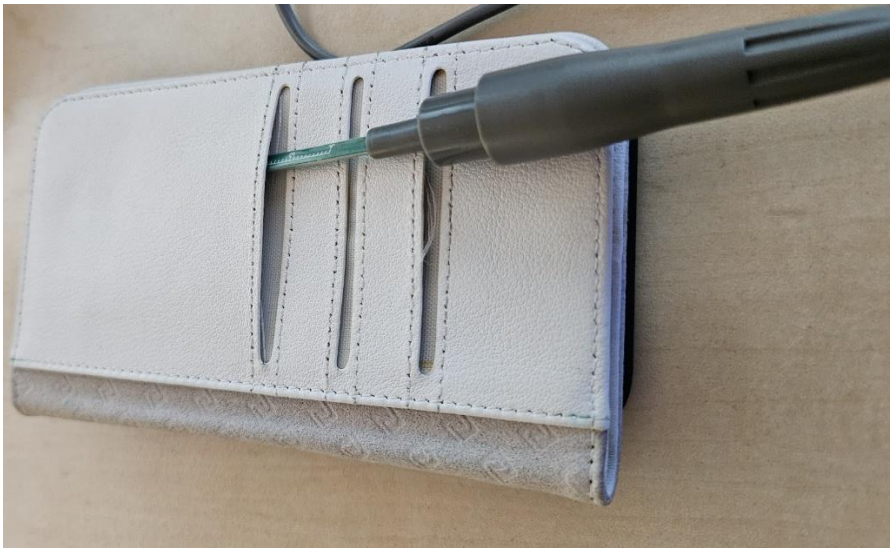


329. In this configuration, the cover piece sits against Zhu's back plate 210 or Kinshi's base piece 3 with minimal separation, and the protruding card tops, along with the magnetic stripes located on those protruding portions, are in a close relationship to the magnet groups embedded in the back plate or base piece as well as those magnets that are embedded into the snap on phone case. Rather than providing protection, the folded-back position increases the magnetic strength of the phone panel side magnets. The first image below shows the Zover folio open with the phone case in place on the right side and a credit card in the top left slot showing where the stripe would be, and then there is magnetic imaging paper showing the location of multiple magnets that line up with the data stripe of cards that are inserted in the slots. When the folio was open the strength of the magnets

was measured from within the card sleeve exactly where the data stripe would be and the strength of two of the magnets are shown below.



330. The next image shows the same folio opened back on itself with the phone case in place and the gauss meter inserted into one of the slots showing how the measurements were taken with the folio open, as shown above, and then the folio folded back on itself as shown below. As stated earlier, when the folio is folded back on itself the magnets in the phone case, the phone case panel, and the card side panel all line up and the cards within the slots actually see about a 50% increase in magnetic field.



331. When the folio is folded back on itself the new reading in the upper card slot increased from 810 gauss to 1206 gauss, an increase of 49%. The magnet that lines up with data stripe in the lower card slot increased from 870 gauss to 1330 gauss, and increase of 53%. Both of these levels are higher than the 300 oersted level of LoCo data cards.

332. This problem does not go away if Goto's shielding was used as proposed by Dr. Phinney. As discussed below in Section V.B.e.ii, the shielding taught by Goto simply cannot stop more than a small fraction of the magnet field passing through the folio.

333. There is also another significant real world problem with trying to add Dr. Phinney's shielding to a folio style wallet; the loss of function. If thick shielding was placed on the front and back of the card side of the wallet, the

magnets on the phone side of the wallet would not be able to securely hold the wallet in place when it is folded back onto itself. Every wallet that I have purchased, and every wallet that I have reviewed, and the wallets that Dr. Phinney show in his declaration shows this feature. Additionally common sense makes this a valuable feature. Without it, all of your valuables on the credit card side of the wallet would flop around slinging cards and cash every time you opened it up as opposed to opening and securely latching onto the phone side panel.

334. A PHOSITA would not have been motivated to modify the wallet of Zhu or Kinshi using Baca's powerful, rare earth magnets because the shielding doesn't prevent the exposure of the cards to the magnetic flux, thus allowing the cards to be corrupted in both the open and closed positions. The shield also would eliminate a valuable function of providing a secure attachment when the backside of the panels attach to one another in a folded back position.

ii. The Back-Side Shield Cannot Intercept the Relevant Field Path

335. In the folded-back configuration, Petitioner's proposed combination relies on the Back Side Shielding Plate, embedded in the back wall of the cover piece behind the card pockets, to provide protection for the cards. But the Back Side Shielding Plate cannot intercept the relevant field path in this configuration unless

the shield is so thick that it can redirect all of the field lines, that is, it does not become saturated, (See Section III.C for discussion on saturation). The magnetic field lines from the magnet groups to the exposed stripe tips travel through air around the top edge and side edges of the cover piece. They do not pass through the Back Side Shielding Plate because the Back Side Shielding Plate is located in the back wall of the cover piece, but the field lines traveling to the exposed stripe tips reach those tips by traveling over and around the top edge of the cover piece through unshielded air.

336. The physical principle established in the ferromagnetic shielding section of this declaration governs this configuration directly. A planar shield with an open edge cannot redirect all of the field lines especially if it is not permeable enough and/or thick enough to avoid saturation. The Back Side Shielding Plate presents exactly this geometry: it is a planar shield with an open edge at the top of the cover piece, and the relevant field lines reach the exposed stripe tips via an air path that goes around the open top edge rather than through the shielding plate. The Back Side Shielding Plate is simply not in the relevant field path for the exposure that corrupts the cards in the folded-back configuration.

iii. Goto's Attenuation Rationale Does Not Apply to the Open-Top Folio Geometry

337. Dr. Phinney relies on Goto's stated "attenuation effect due to distance of total thickness of the composite" as the basis for the shielding benefit he attributes to the proposed combination. EX1003, [274] (citing EX1012, 3:9-33). But as established above in the discussion of Goto (Section IV.E), this attenuation effect is specifically tied to Goto's fully enclosed card holder geometry in which all field lines from the external source must pass through the composite wall to reach the card because there is no bypass air path. In Goto's geometry, every approach path from the external field source to the card encounters the composite wall, and the attenuation scales with the total composite thickness that the field must traverse on any approach path.

338. In the open-topped folio geometry of Zhu and Kinshi, the dominant field path to the exposed stripe tips travels through air from the magnet groups to the top of the card, around the open edge of the cover piece, without encountering any composite shielding material. Air has essentially zero magnetic attenuation compared to iron composite, meaning that the field traveling along this bypass path reaches the exposed stripe tip at essentially full field strength with no attenuation from the shielding plates embedded in the pocket walls. Goto's attenuation rationale

cannot be transplanted from the fully enclosed geometry in which it applies to the open-topped folio geometry in which it does not, and a PHOSITA skilled in magnetic shielding design would recognize this incompatibility before concluding that Goto's shielding provides meaningful protection in the Zhu or Kinshi folio context.

339. In addition, a PHOSITA would have understood that Goto's electrodeposited foil is useless in this application as electrodeposited foil cannot withstand the high magnetic fields produced by Baca's Neo magnets and thicknesses above 50μm are not practical. Goto teaches electrodeposited iron of around 10μm up to 50μm. "This kind of electrodeposited iron foil must be used, in order to give sufficient magnetic permeability, at a thickness of 10μm or more. ***Although the highest limit is, from the view of handling and commercial practicability, 50μm or so***, thickness of more than 50μm are permissible. For example, an iron foil of as thick as 100μm can be actually used." EX1012, Col. 3:40-46 (emphasis added). A PHOSITA would have understood that 50μm is half the thickness of a sheet of paper, and according to Goto, "the highest limit is, from the view of handling and commercial practicability." Half the thickness of a sheet of paper has virtually zero effect on a powerful magnetic such as Baca's

Neodymium N48 magnet. To avoid being saturated by a Neo magnet of the size and type taught by Baca, the iron would need to be about 0.022" thick while Goto teaches that the maximum commercially practical thickness for iron foil is 50µm, which is just under 0.002" thick or 1/10th the thickness needed to avoid saturation. A PHOSITA would have understood that Goto shielding is not remotely useful in this application, even the credit cards were completely enclosed by the electrodeposited iron foil.

iv. The Folded-Back Position Is Geometrically Variable and Transient

340. An additional deficiency of the proposed combination in the folded-back configuration is that the folded-back position is inherently dynamic and variable, not the static geometry that Goto's shielding is designed to address. Unlike Goto's static, fully enclosed card holder in which the card's position relative to the shielding material is fixed and invariant, the folded-back folio position is a dynamic configuration in which the cover piece moves during folding and shifts during use depending on the user's grip, handling, and activity. During the folding motion from the closed position to the folded-back position, the pocket openings sweep through positions of varying proximity to the magnet groups in the back plate or base piece, creating exposure risk during the transition itself as the exposed stripe tips pass

through the field at varying distances. A static iron foil plate at a fixed location in the cover panel provides no consistent geometric protection against a field source whose proximity to the exposed stripe tips varies continuously during normal us

f. Operating Configurations Exist in Which the Proposed Combination Cannot Achieve Its Intended Purpose

341. The analysis above establishes that the proposed combination of Zhu or Kinshi with Goto's shielding fails to achieve its only stated purpose — card protection — in the operating configurations that Petitioner identifies.

342. In the folio-closed position, which is the most ordinary everyday operating configuration of a folio phone case, the Front Side Shielding Plate fails because the magnetic stripe, beginning no less than approximately 5 mm from the top edge of the card, falls within the protruding unshielded zone above the pocket opening, and the field from the magnet groups reaches the exposed strip through an unshielded bypass air path that the Front Side Shielding Plate cannot intercept. Any exposure of that protruding strip portion to a field exceeding the damage threshold renders the card entirely non-functional, providing zero net protective benefit from the shielding despite its cost and manufacturing complexity.

343. In the folio-folded-back position, the Back Side Shielding Plate fails because the relevant field lines from the magnet groups to the exposed stripe tips

travel through air around the open top edge of the cover piece, bypassing the Back Side Shielding Plate entirely. The Back Side Shielding Plate is not in the relevant field path, Goto's attenuation rationale does not apply to the open-topped folio geometry in which bypass paths exist, and the dynamic variability of the folded-back position during normal use precludes consistent geometric protection from a static shielding plate.

344. These failures apply to operating configurations the Petitioner identifies and result from the fundamental geometric incompatibility between Goto's shielding architecture, which was designed for a fully enclosed static card holder with no bypass air path, and the open-topped folio pocket geometry of Zhu and Kinshi, which inherently creates bypass air paths that defeat the shielding mechanism in every operating configuration.

345. A PHOSITA would have understood the physics of ferromagnetic shielding and the all-or-nothing corruption behavior of magnetic strips and would have recognized before making the combination that the proposed combination would not achieve its only stated purpose in the anticipated operating configurations. This recognition eliminates the motivation to combine entirely. A PHOSITA would not have added cost and manufacturing complexity for a

modification known in advance to provide no benefit. The proposed combination does not represent an obvious engineering improvement to Zhu or Kinshi. It represents an attempt to re-create the claimed invention using hindsight, but fails because it attempts to apply a shield designed for a fundamentally different structure into a geometry that that it cannot, nor was intended, to address.

g. Actual Testing Confirms the Corruption of Magnetic Cards by Regular and Low Grade Rare Earth Magnets

346. To confirm my understanding that credit card magnetic stripes can be readily damaged by magnets less powerful than the rare earth magnets Baca specifies, and to evaluate that risk in the context of actual folio cases of the type Zhu and Kinshi disclose, I conducted a straightforward physical test using commercially available gift cards encoded with magnetic stripe data.

347. I purchased two gift cards from a local Winn-Dixie grocery store and had five dollars loaded onto each card. The gift cards are preprinted with the necessary data and at the time of purchase they are simply scanned, like a grocery item, and then the clerk enters the dollar value into their system so that when that card is used in the future, their system tracks how much money is on it at any given time. The cards were randomly selected from available stock. Prior to testing, I verified that the data was correct by passing each card through the card reader and

confirming that the balance was correctly read and displayed. I verified each card multiple times to confirm that both cards were fully functional and working correctly before any testing began. The two cards are referred to below as Card 1 and Card 2.

348. The figures below show the folio cases used in the test — cases representative of the Zhu and Kinshi style designs — with a card inserted in the pocket in each of the three configurations relevant to normal folio use: open position, folded back approximately 180 degrees, and closed without a phone case.






Zhu Style Folded Back on Itself
Kinshi Style Folded Back on Itself
Zhu Style Closed
Kinshi Style Closed

349. With both cards confirmed as functional, I tested each card by placing it in the card pocket of the respective folio case and cycling through the operating configurations shown in the figures above — open position, folded back, and closed without a phone. Each configuration was tested multiple times. I also repeatedly slid each card in and out of the card pocket as a user would normally do when inserting and removing cards during daily use. All testing was conducted with the cards fully inserted in the card pockets of the respective cases. The results were as follows:

350. Card 1, tested in the Zhu-style folio case, showed no data corruption after cycling through all operating configurations and repeated insertion and removal from the card pocket. The card remained fully functional and readable after all testing in the Zhu-style case.

351. Card 2, tested in the Kinshi-style folio case, showed data corruption after a small number of insertion and removal cycles. Specifically, after sliding the card in and out of the Kinshi-style pocket a few times in the normal manner a user would employ when accessing cards during daily use, the card was no longer readable. When passed through the card reader, the reader produced an error tone indicating an unreadable card. While the reader still recognized that a card had been

presented — suggesting that some residual magnetic signal remained on the stripe — the encoded data had been sufficiently corrupted that the reader could not reconstruct a valid data sequence. The card was functionally non-operational for its intended purpose.

352. This result is consistent with the analysis set forth throughout this declaration. The magnets in the Kinshi-style folio case, though unspecified in grade, are strong enough — as Dr. Phinney himself acknowledged in his deposition — to hold cards securely in the folio during normal use. The repeated sliding of the card past those magnets during insertion and removal brings the magnetic stripe into close proximity with the magnets multiple times, and the cumulative exposure of the stripe to the magnet fields during those passes is sufficient to corrupt the encoded data. This is precisely the kind of real-world operating condition that a PHOSITA conducting a Failure Modes and Effects Analysis would identify as a foreseeable failure mode before committing to a design that places permanent magnets adjacent to credit card magnetic stripes.

353. Following the folio case testing, I conducted a second test to directly evaluate the effect of a rare earth permanent magnet on the magnetic stripe of a functional credit card at distances representative of the wallet-on-phone

configurations the prior art discloses. For this test I used Card 1, which remained fully functional after the Zhu-style folio testing, as the test subject.

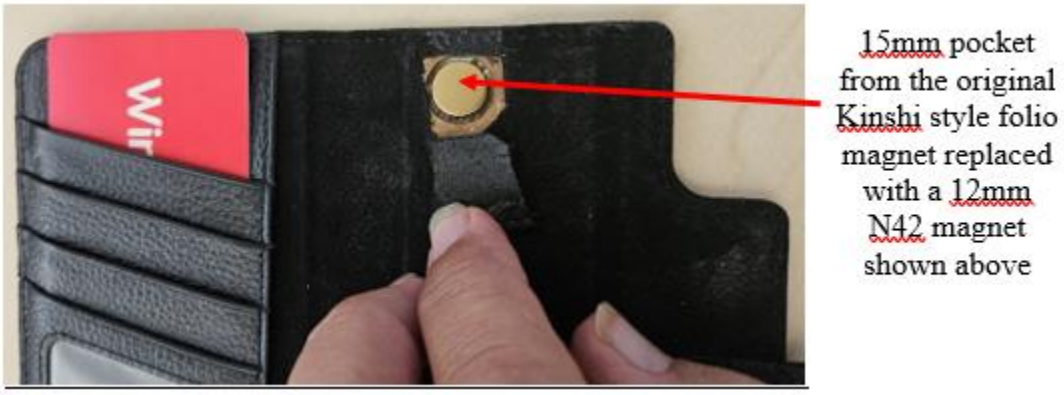
354. I used a single neodymium rare earth magnet measuring approximately 12 mm in diameter by 3 mm in thickness, with a maximum surface field reading of 2,937 Gauss. This magnet is grade N42, a low-to-mid grade neodymium rare earth magnet that is less powerful than the N48 minimum grade that Baca specifies and less powerful than the N52 grade that Baca identifies as preferred.

355. The figure below shows the size of the N42 neodymium magnet used in the test and the surface field reading of 2,937 Gauss.



356. I then replaced one of the magnets in the Kinshi-style folio with the Neo, as seen below. The N42 Neo is fit into the existing opening in the wallet as it is just a bit smaller in diameter than the original magnet that was there. Then I slid

the card in and out of the wallet multiple times in varying orientations that match normal use.



357. After exposing Card 1 to the N42 magnet at this proximity, I tested the card in the card reader. The result was unambiguous and definitive: the card was not merely damaged in the sense of producing corrupted but partially readable data, it was completely unrecognized by the reader. The reader treated the magnetic stripe as though it were the plain plastic face of the card, producing no recognition signal whatsoever. The stripe had been so thoroughly demagnetized by the single N42 magnet exposure that the reader could not detect that any encoded magnetic data had ever existed on it.

358. Several observations about these test results are significant for the analysis in this proceeding.

359. First, the magnet that completely demagnetized Card 1 was grade N42 — a magnet that is weaker than the N48 minimum that Baca specifies and substantially weaker than the N52 grade Baca prefers. Baca's specified magnets would produce higher field strengths at equivalent distances than the N42 magnet used in this test, meaning that the card corruption effect demonstrated here understates rather than overstates the risk that Baca's teaching creates in the context of Berkley's credit card wallet.

360. Second, the result was not a partial corruption that left the card marginally functional — it was a complete destruction of all encoded data, consistent with the analysis in the magnetic stripe section of this declaration establishing that stripe exposure is an all-or-nothing event. The reader's complete inability to detect any encoded data on the stripe after N42 magnet exposure at wallet-proximity distances confirms that the damage threshold for data card stripes is exceeded at field strengths and proximity distances directly relevant to the prior art configurations.

361. Third, Card 2 was corrupted not by direct magnet contact but by the normal operating motion of sliding the card in and out of a folio pocket in the presence of the folio's unspecified magnets — magnets that Dr. Phinney himself

acknowledged are strong enough to hold cards in the folio during use. This confirms that the card corruption risk is not limited to static proximity of magnets to cards but arises during the ordinary, foreseeable use of the prior art folio designs.

362. Fourth, and most importantly for the shielding analysis, both results occurred with direct air-path exposure of the stripe to the field source, which is precisely the exposure condition that exists in Zhu and Kinshi's open-topped pocket designs, where the upper portion of the card's magnetic stripe protrudes above the pocket opening and is exposed to the folio magnets through an unshielded air path in every operating configuration. The addition of shielding material to the pocket walls, as Petitioner and Dr. Phinney propose through the Goto combination, cannot address this bypass-path exposure because the protruding stripe portion above the pocket opening is geometrically outside the shielded walls regardless of how much shielding material is added to those walls. It is clear from the image above that the N42 magnet that completely wiped clean the data card resides in a part of the wallet that is not shieldable.

363. These test results are not surprising. They are exactly what a person of ordinary skill in the art with knowledge of magnetic stripe technology and permanent magnet field strengths would predict before conducting the tests. The

fact that the results were entirely anticipated is itself significant: it confirms that the card corruption risk from placing permanent magnets adjacent to credit cards' magnetic stripes in the configurations the prior art discloses is not a subtle or uncertain risk that a PHOSITA might overlook. Rather, it is a predictable, foreseeable consequence that a PHOSITA familiar with both magnetic stripe technology and rare earth permanent magnets would identify before designing a product that combines them.

364. This is precisely the point that is central to the non-obviousness analysis. A PHOSITA who would have predicted these results before conducting the tests and would have recognized before combining Berkley's wallet with Baca's powerful magnets that such a combination destroys Berkley's primary use case. That recognition teaches away from the simple combination, defeats any reasonable expectation of success in the combination as proposed, and establishes that arriving at the claimed invention required the non-obvious inventive step of recognizing the card corruption problem and solving it through the specific integrated dual-array-with-shield architecture that the '641 patent claims.

365. The testing further confirms the geometric analysis of the Zhu-Kinshi-Goto combination set forth in this declaration. Ignoring the fact that Goto's

shielding at 50μm couldn't do a thing to protect cards against Baca's N48-N52 magnets, Goto's shielding cannot protect the portion of the magnetic stripe that protrudes above the open top of Kinshi or Zhu's pockets, because that portion of the stripe is exposed to an unshielded air-path field — the same type of exposure that corrupted Card 2 during normal folio use and that demagnetized Card 1 completely upon proximity to an N42 magnet. Adding Goto's iron foil to the pocket walls does not close the bypass path through the open top, does not shield the protruding stripe portion from the field source, and therefore provides zero net protection to the credit cards in those pockets. A PHOSITA would have understood these physical principles and would have recognized this geometric incompatibility before combining Goto's shielding with Zhu or Kinshi's open-topped pocket designs. As a result, a PHOSITA would therefore have had no motivation to incur the cost, manufacturing complexity, and corruption risk of combining the Zhu or Kinshi folios with Goto's shielding because the predictable and known result was that there would be zero functional benefit.

C. Neither Zhu Nor Kinshi Disclose a Compartment (all claims)

366. Zhu and Kinshi's open-top pockets are not "compartments" as that term is used and described in the '641 Patent.[6]

a. The Claim Term "Compartment" Means an enclosed space for holding cards, money, etc.

367. As noted above (Section I.D), I understand that claim terms are given their ordinary and customary meaning as understood by a person of ordinary skill in the art in light of the specification and prosecution history and that the specification is the primary source for understanding the scope and meaning of claim terms. I further understand that where the specification consistently depicts and describes a structural feature in a particular way, that consistent depiction informs the ordinary meaning of the corresponding claim term. I have reviewed the '641 Patent's specification, figures, and prosecution history in forming the my opinions that a PHOSITA would understand the meaning of the claim term "compartment" as a bounded, enclosed space for holding cards, money or other like items.

[6] As explained in Section IV.B, Zhu does not disclose that the oval shaped features are even pockets, much less the claimed compartment. For the sake of argument, I have assumed that Zhu discloses pockets as disclosed in Kinshi.

368. As shown below, for example, in FIG. 2, the intrinsic record consistently and uniformly depicts and describes the compartment of the claimed wallet as a bounded, enclosed space for holding cards, with defined walls on all sides surrounding the card-holding interior and with the ferromagnetic shield meaningfully interposed between the compartment and the magnetic arrangements on a defined face of the wallet body. The compartment as depicted in the '641 Patent's figures does not expose any portion of the face of any stored card. A content removal slot (not shown below) that provides controlled access to the compartment interior to remove cards. *See e.g.,* FIG. 9.

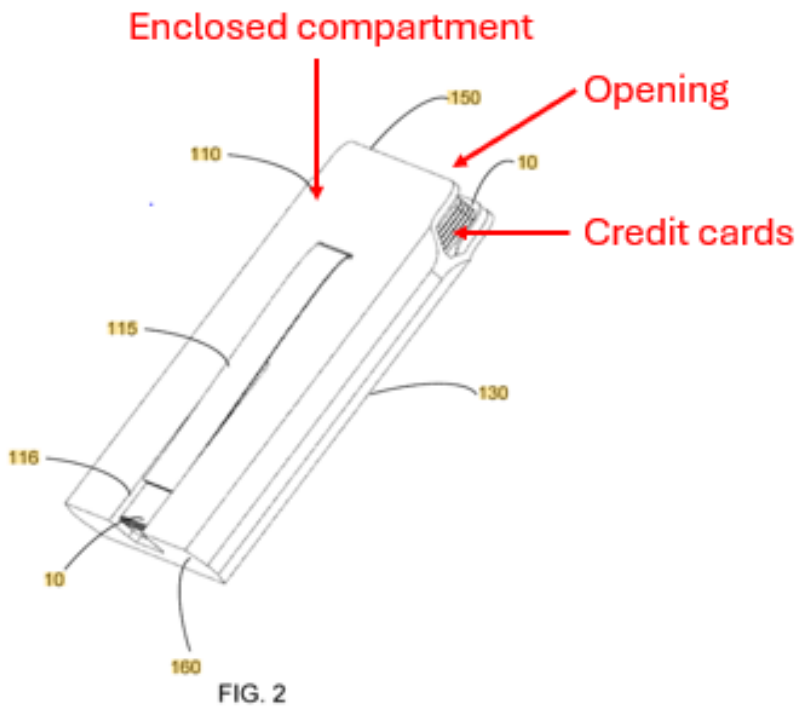


FIG. 2

369. As shown, for example in FIG. 3, the shield is depicted as interposed between the magnetic arrangements on the device side surface and the interior of the compartment on the device side face, meaning that there is a defined boundary on the device side of the compartment against which the shield is positioned.

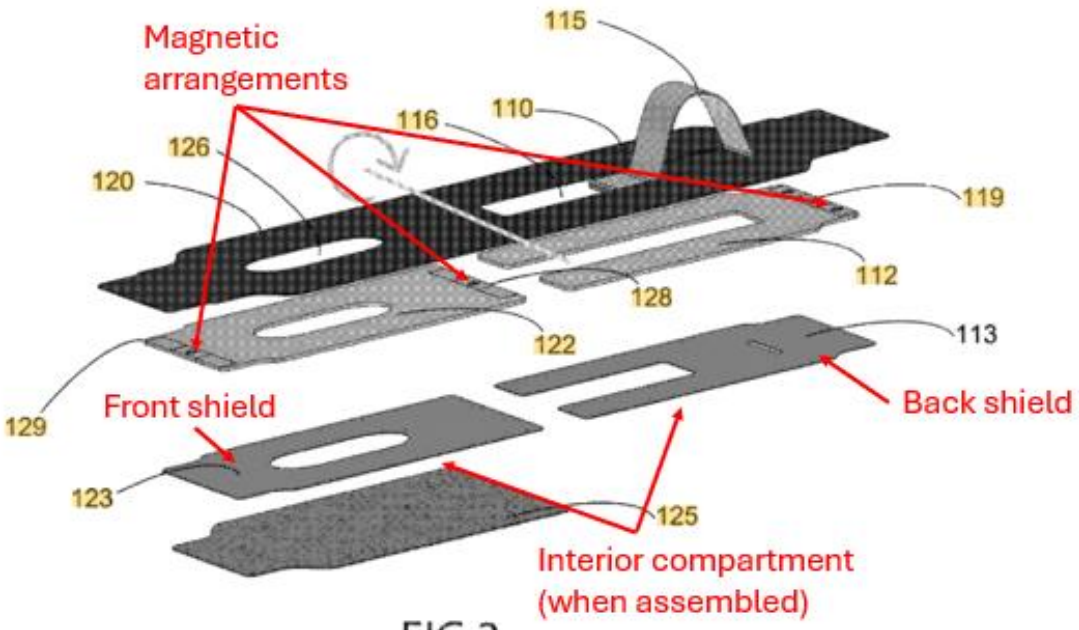


FIG 3.

370. The compartment's enclosed character is not incidental to its depiction in the specification. It is a structural feature that is necessary for the shield to perform its function of protecting the compartment's contents from the fields the magnetic arrangements produce, because a shield can only interpose between a field source and a protected space if that protected space has a defined boundary on the side facing the field source.

371. The ‘641 Patent consistently depicts and describes the compartment as a bounded, enclosed space for holding cards, with the shield meaningfully interposed between the compartment and the magnetic arrangements on a defined face. *See* FIGS. 1, 2, 6, 7, 8A, 8B, 9, 10, 11, 12, 13C, 14A, 14B, 15A, 15B, 16A, 16B, 17A, 17B, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 31, 32.

372. No embodiment in the ‘641 Patent's specification depicts or describes a compartment that exposes any portion of the face of the enclosed cards, and no embodiment depicts or describes the cards as protruding from the compartment when attached to the personal electronic device.[7] The specification's consistent depiction of the compartment as a partitioned, fully bounded card-holding space reflects the structural necessity of the compartment's enclosed character for the claimed invention to function: the shield can only protect the compartment's contents if the compartment has a defined boundary on the face between the shield

[7] Figures 29-31 showing cards protruding in the kickstand configuration are distinguishable because in that configuration, the compartment is physically separated from the personal electronic device, which mitigates any potential interference from the device side magnets.

and the contents, and the shield can only meaningfully interpose between the magnetic arrangements and the compartment if the compartment is a bounded space with a defined face on the device side against which the shield is interposed.

373. The Patent Trial and Appeal Board addressed the meaning of the term "compartment" in the context of the claim 2 rejection during the *ex parte* prosecution of the application that issued as the ‘641 Patent. The Board applied the ordinary meaning of compartment as "a part or space marked or partitioned off," citing dictionary definition. EX1002, 455. While the Board’s broad construction’s does not recite complete enclosure, it does require that the space be meaningfully "marked or partitioned off" from the surrounding structure. A space that is "partitioned off" is one whose boundaries are defined by structural walls or surfaces that separate the interior space from the exterior on all relevant sides. While my articulation of how a PHOSITA would understand “compartment” differs slightly from the Board's, both contemplate that it is an enclosed space with defined boundaries on the sides relevant to the claim's structural requirements. As noted, the Board did not cite to the specification, but instead a generic definition of “compartment” from Dictionary.com. *Id*., n.5.

b. Zhu and Kinshi's Open-Top Pockets Do Not Satisfy This Construction

374. As addressed above (Section IV.C), Petitioner's own expert Dr. Phinney concedes that Zhu's panel 230 depicts three elongated ovals but that Zhu's disclosure is entirely silent as to the identity or function of those ovals. Dr. Phinney does not identify those ovals as compartments in Zhu's own disclosure. He does not explain what Zhu's disclosure says those ovals are, what purpose they serve, or what structural character they have. This concession is significant for the compartment analysis: if Petitioner's own expert cannot identify Zhu's ovals as compartments based on anything Zhu actually discloses, Petitioner cannot establish that Zhu discloses a compartment satisfying the claim term under any reasonable construction.

375. To the extent Zhu and Kinshi disclose card-holding pockets, those pockets are open-topped sleeves, not compartments in the sense the ‘641 Patent's claims require. The top of each sleeve is open by deliberate design, exposing a significant portion of the face of any stored cards during normal use. This open design is not an incidental gap. It is the intended functional mechanism to store and retrieve the cards.

376. Put another way, under the Board's articulation, a sleeve is not a compartment because it does not entirely "partition off" the interior space from the exterior. Cards are simultaneously within the sleeve walls below and extending into open space above, with no structural boundary between the exposed part of the card and the exterior.

c. The Open-Top Design Is Inconsistent With the Purpose the Compartment Serves in the Claims

377. Claims 1-4, 6-10 of the '641 Patent require, respectively, a ferromagnetic shield positioned "between the first and second arrangements and the compartment" while claim 5 requires a metallic shield position "between the first arrangement and the compartment." The word "between" in this context describes a positional relationship in which the shield occupies the space separating two defined structural elements, the arrangements on one side and the compartment on the other, in order for the shield meaningfully intercepting the field path from the arrangements to the compartment interior.

378. The image below on the left is a folio made by Zover and the image on the right is a second folio style case that is made by Burkley. These cases are similar to Zhu and Kinshi respectively.



379. In both instances the credit card shown was inserted as far as it would go into card slot and it is clear that in both instances part of the encoded track remains exposed. As noted, folio style cases are designed so that a certain amount of the card remains exposed so that the cards can be easily removed when needed. The amount of the card that remains outside of the pocket is determined by the specific manufacturer. What is clear is that both of these manufacturers decided that they needed to leave between 15mm and 22.5mm of the card exposed which

means that the between 7.5mm and 15mm of the encoded tracks will be outside of the card slot thus exposing card stripe data to being damaged by the magnets in the folio style cases. As a result, a PHOSITA would have understood that the folios of Zhu and Kinshi do not have "a ferromagnetic shield between the first and second arrangements and the compartment" as required by Claims 1-4, 6-10 of the '641 Patent or "a metallic plate between the first arrangement and the compartment" as required by Claim 5 of the '641 Patent.

D. Neither Zhu Nor Kinshi Disclose a "Content Removal Slot" (Claim 2)

a. Claim 2 Requires a Content Removal Slot as a Structure Separate and Distinct From the Compartment Itself

380. Claim 2 depends from claim 1 and adds the limitation that "the body defines at least one content removal slot." Because claim 2 depends from claim 1, I understand that to render obvious claim 2, every element of claim 1 must be shown in the prior art as well as additionally disclosing the content removal slot requirement that claim 2 adds. The content removal slot is therefore a structural element that is separate from and additional to the compartment that claim 1 already requires.

381. The '641 Patent's specification and figures describe and depict the content removal slot as a specific structural feature that is distinct from the

compartment and distinct from the opening through which the compartment is accessed for card insertion. As shown below in FIG. 8B, the content removal slot is a discrete structural element defined by the body of the wallet, sized and configured to allow a user to place a finger against the edge or face of a card within the compartment and push or guide the card upward and out of the compartment. The content removal slot provides a dedicated access point through which the user can physically contact and manipulate the cards within an already-defined bounded compartment, facilitating the removal of cards that would otherwise be enclosed within the compartment with no direct access to their edges or surfaces.

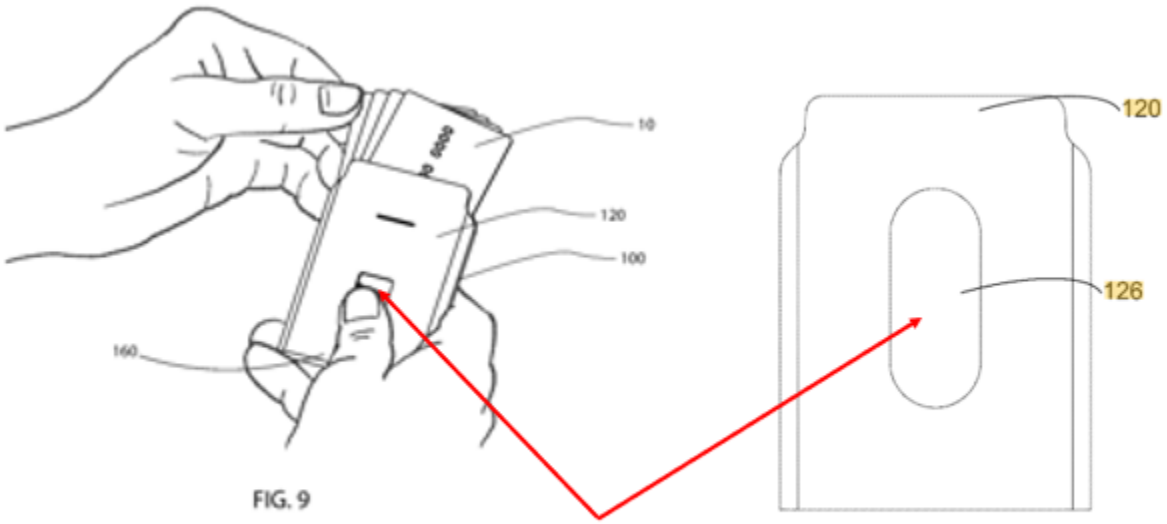
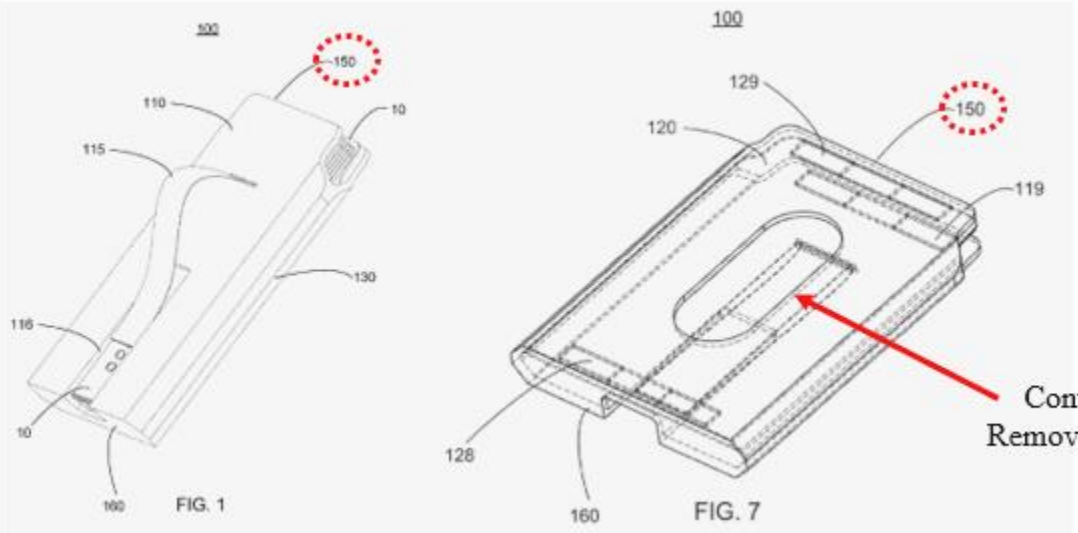


FIG. 9

FIG. 8B

382. The ‘641 Patent defines what a content removal slot is. “Wallet 100 includes a content removal slot 126 that facilitates the removal of credit cards 10. A user can place their finger through the content removal slot 126 and slide credit cards 10 through the top portion 150 of wallet 100.” EX1001, Col. 8:58-62. This can be seen in FIGS. 1 and 7 of the ‘641 Patent below. Those skilled in the art would have understood that the content removal slot 126 cannot be the opening that the credit cards slide in and out of. In FIGS. 1 and 7 of the ‘641 Patent, the credit cards are slid in an out of the top portion 150 of the wallet 100 and the content removal slot 126 is a separate element where the user places their finger through the slot and slides the credit card out of the wallet through the top portion 150 which is the top portion of the compartment. The content removal slot is a separate and distinct element from the opening that is used to slide credit cards in and out of the wallet.



383. A folio style wallet uses horizontal slots that allow a user to slide a portion of a credit card in and out of the wallet. The opening is where the cards slides through, it is not what is used to slide the cards in and out of the compartment. There is no opening in Zhu or Kinshi for the user to place their finger through and slide the cards out. Folio style wallets, by design, leave a portion of the card outside the sleeve and the user simply grabs the exposed part of the card to remove it from the wallet.

384. I understand that under the principle of claim differentiation, a dependent claim is presumed to have a scope different from the independent claim from which it depends. Claim 1 already requires the body to define a compartment. If the content removal slot of claim 2 were the same structure as the compartment opening of claim 1, claim 2 would add nothing to claim 1 — it would merely repeat

a limitation already present in the independent claim, rendering the dependent claim superfluous. I understand that a claim construction that renders a dependent claim superfluous is disfavored and should be rejected. The content removal slot of claim 2 must therefore be a distinct structural element that adds a meaningful limitation beyond the compartment that claim 1 requires.

385. The specification confirms this. The compartment is the bounded space that holds the cards. The content removal slot is the discrete access feature separately defined, sized, and configured to allow a user to push or guide a card out of that already-defined compartment. The slot and the compartment opening are not the same structure. The compartment opening is the boundary of the enclosed compartment space, defining where the compartment ends and the exterior begins. The content removal slot is a dedicated access feature that allows the user to interact with cards inside the compartment for removal, positioned and configured for that specific functional purpose. These are distinct structural features with distinct functional roles, and the principle of claim differentiation confirms that they must be treated as such.

b. Zhu and Kinshi Do Not Disclose Content Removal Slot

i. Zhu's Panel 230 Provides No Textual or Structural Basis for a Content Removal Slot

386. The content removal slot analysis begins with Zhu, and it begins with a concession that is fatal to Petitioner's position. Dr. Phinney acknowledges in his declaration (EX1003, ¶ 121) that Zhu's panel 230 is "simply silent" with respect to the three elongated ovals depicted on it. Zhu's specification provides no textual description of those ovals, no identification of their structural character, no description of their function, and no explanation of their relationship to any other feature of Zhu's folio case assembly. Dr. Phinney cannot establish from Zhu's disclosure what those ovals are, and his declaration resorts to speculation about what Zhu "may have intended" rather than pointing to anything Zhu actually teaches.

387. This concession has direct and fatal consequences for the content removal slot analysis. If Zhu cannot establish from its own disclosure that the elongated ovals on panel 230 are compartments — a threshold requirement that Petitioner cannot meet, as established in the preceding section — then Zhu certainly cannot establish that any separate content removal slot exists for accessing those undescribed compartments. As noted, a content removal slot is a structural feature

that presupposes a bounded compartment from which content is to be removed. If Zhu does not disclose bounded compartments, it cannot disclose content removal slots for accessing those compartments. A reference that provides no textual description of the structural features Petitioner relies upon as compartments cannot simultaneously be read to disclose a distinct content removal slot that provides access to those undisclosed, undescribed compartments. Zhu thus does not disclose the claimed content removal slot element of claim 2.

ii. Zhu's Ovals Cannot Be Both Compartments and Content Removal Slots

388. A further and independent deficiency in Petitioner's reliance on Zhu for claim 2 is that the elongated ovals in Zhu's panel 230 are already pressed into service by Petitioner as the alleged compartments purportedly satisfying claim 1's compartment requirement. To the extent Petitioner relies on those ovals for the compartment element of claim 1, those same ovals cannot simultaneously constitute the content removal slot that claim 2 requires as an additional, distinct structural element.

389. I understand that this double-use of the same structural feature violates the claim differentiation principle established above. If the ovals in Zhu's panel 230 are the compartments, as Petitioner's claim 1 mapping requires, then there

is no separate structural feature in Zhu's panel 230 to supply the distinct content removal slot that claim 2 adds. And if those ovals are the content removal slots — sized and configured to provide access to an underlying compartment, then there is no separate compartment in Zhu's panel 230 satisfying claim 1's compartment requirement. Either way, the same structural features cannot simultaneously disclose both a bounded compartment and a distinct content removal slot. Zhu's panel 230 therefore provides no disclosure of any content removal slot under any reasonable construction, independently of and in addition to the absence of any textual description of those features in Zhu's specification.

iii. Dr. Phinney Points to the Same Structure in Kinshi for Both Claim Elements — A Double-Use That Violates Claim Differentiation

390. The double-use problem that defeats Petitioner's reliance on Zhu is reproduced and made explicit by Petitioner's expert Dr. Phinney's treatment of Kinshi. Dr. Phinney's mapping of Kinshi's features to the claim limitations of claim 1 and claim 2 reveals a fundamental structural inconsistency that independently defeats the claim 2 combination.

391. For claim element 11.A of claim 11, Dr. Phinney identifies Kinshi's pockets 5 as the claimed compartment. EX1003, ¶¶376-377; ¶283. Dr. Phinney points to Kinshi's pocket structure, the sleeve that holds the cards, as purportedly

satisfying claim 1's requirement that the body define a compartment. For claim 2's content removal slot requirement, Dr. Phinney identifies the openings of Kinshi's pockets 5 as the claimed content removal slot. Dr. Phinney points to the open top of Kinshi's pockets, which Kinshi describes as "openings of the pockets 5... to allow cards to be slid in and out in the vertical direction" EX1010, [0015], as satisfying claim 2's requirement that the body define at least one content removal slot. EX1003, ¶327.

392. This mapping uses the identical structural feature, the opening of Kinshi's pocket, to satisfy two distinct claim limitations in a dependent claim relationship. The opening of Kinshi's pocket is simultaneously what Dr. Phinney relies upon to define the pocket as a compartment for claim 1, and what Dr. Phinney relies upon as the content removal slot that claim 2 adds as a distinct additional limitation. This is the precise structural identity that the claim differentiation principle prohibits. A single structural feature cannot simultaneously constitute two distinct claim elements in a dependent claim relationship. The scope of the dependent claim must be narrower than the scope of the independent claim, meaning that the dependent claim's additional limitation must be a distinct structural feature that adds something beyond the independent claim's structural

requirements. Where the same feature is mapped to both the independent claim's compartment and the dependent claim's content removal slot, the dependent claim adds nothing, and the mapping is inconsistent with the basic structural requirement that claim 2 be narrower than claim 1.

iv. Kinshi's Pocket Opening Is the Compartment Opening — Not a Separate Slot

393. Beyond the claim differentiation problem, Dr. Phinney's mapping of Kinshi's pocket opening as the content removal slot is substantively incorrect under the construction of that term established in the preceding subsection. Kinshi's pockets 5 are open-topped sleeves, and the opening at the top of each pocket is not a discrete slot cut into an otherwise bounded compartment. It is the structural feature that defines the pocket as an open sleeve in the first place. Kinshi's pocket opening is the pocket's opening, not a content removal slot distinct from the pocket.

394. As noted, the distinction between a compartment opening and a content removal slot is both structural and functional. The content removal slot in the '641 Patent is a discrete feature cut into the body of the wallet that provides a dedicated access point for card removal from a pre-existing, bounded compartment. The slot is defined by the body separately from the compartment structure, providing a specific mechanism for interacting with cards inside the closed

compartment. Kinshi's pocket opening is not cut into the body separately from the pocket structure — it is the open top of the pocket, which is not a bounded compartment at all for the reasons discussed above. There is no pre-existing bounded compartment in Kinshi from which a content removal slot provides access. There is only an open sleeve whose top edge is open by design, and that open top edge is simultaneously the only entry point into the pocket and the structural feature that prevents the pocket from qualifying as a compartment in the first place.

395. In short, Kinshi does not have a compartment with a separate content removal slot. Kinshi has an open sleeve with a single opening that functions as both the card entry path and the card exit path. That single opening cannot be deconstructed into a compartment and a distinct content removal slot, because the compartment and the content removal slot are distinct structural features whose distinction depends on the compartment being a bounded space and the slot being a separate access feature — a relationship that requires two different structures, not one structure pressed into double service.

E. The Combination Therefore Fails to Render the Claims Obvious

396. In short, in addition to the lack of motivation for a PHOSITA to add the shield of Goto to Zhu and Kinshi, these two additional independent and

mutually reinforcing deficiencies in Petitioner's reliance on Zhu and Kinshi defeat the obviousness of the claims under both Grounds 2 and 3.

397. First, neither Zhu nor Kinshi independently discloses a compartment within the meaning of claim 1. Zhu's panel 230 is entirely silent regarding the three elongated ovals depicted in its figures. Dr. Phinney concedes this and a reference that provides no textual description of its alleged structural features cannot establish that those features constitute a bounded, partitioned space satisfying the compartment requirement. Kinshi's pockets 5 are open-topped sleeves that are bounded on three sides but open at the sleeve top by deliberate design, and a structure that is open on one face by deliberate functional intent is not "partitioned off" in any meaningful sense within the meaning that a PHOSITA would give that term in reference to a compartment.

398. Second, neither Zhu nor Kinshi independently discloses a content removal slot as a structural element distinct from the alleged compartment, as claim 2 requires. Zhu is silent on this point entirely — if its unexplained ovals cannot establish the existence of compartments, they certainly cannot establish the existence of a separate content removal slot providing access to those undisclosed compartments, and those same ovals cannot simultaneously serve as both the

compartment and the distinct slot that claim 2 adds as an additional limitation. Kinshi presents the identical structural problem in explicit form: Dr. Phinney maps Kinshi's pocket opening to the compartment for claim 1 and to the content removal slot for claim 2, using the identical structural feature for both distinct claim elements. This double-use violates the claim differentiation principle and reflects the fundamental structural reality that Kinshi has only one opening per pocket — an opening that is the defining feature of the open sleeve structure, not a discrete access slot cut into a compartment. That single opening cannot simultaneously constitute the compartment and the content removal slot that claim 2 adds as a distinct additional element. If it is the compartment, nothing remains to supply the content removal slot. If it is the content removal slot, the compartment mapping for claim 1 collapses.

399. No reference in either the Zhu, Kinshi, and Goto combination supplies the distinct content removal slot structural element that claim 2 requires in addition to the compartment that claim 1 already requires. Goto is a card holder shielding reference that contributes no wallet structural features. Zhu contributes nothing beyond its unexplained and undescribed ovals. Kinshi's single pocket opening purportedly is mapped to the claimed compartment and cannot serve also as the

claimed the content removal. Ground 2A therefore fails to establish the obviousness of claim 2, and Ground 3B fails for the same reasons applied to Kinshi alone.

VI. OBJECTIVE EVIDENCE OF NONOBVIOUSNESS EXISTS

400. I understand that, in order to further protect against the use of hindsight reconstruction to demonstrate that the claims of the '641 Patent would have been obvious to a POSITA at the time of the claimed invention, any objective evidence of secondary considerations of non-obviousness is highly relevant and must be considered. I understand that secondary considerations of non-obviousness include the commercial success of the invention, industry praise for the invention, industry skepticism of the invention, any long-felt but unmet need that the invention solved, copying by competitors and unexpected results. Dr. Phinney addressed only evidence of commercial success that the patent owner presented during the prosecution of the '641 Patent.

401. I have reviewed such evidence carefully, and based on my review, it is my opinion that such evidence weighs heavily in favor of the non-obviousness of the '641 Patent claims. In my opinion, the secondary considerations discussed below demonstrate the non-obviousness of the challenged claims of the '641 Patent.

A. 1LSS's Products are Coextensive with, and have the Required Nexus Between, the Products and Claim Inventions

402. I understand that in order for evidence of secondary considerations to be significant, there must be a nexus between the claimed invention and the evidence of secondary considerations. I also understand that nexus is presumed upon a showing that patent owner's commercial product is an embodiment of the invention claimed in the '641 Patent and is coextensive with the claimed features.

403. I have reviewed a claim chart (Appendix B to the Islam Declaration, EX2024) mapping the limitations of the claims of the '641 Patent to 1LSS's MagBak wallets and, in my opinion, it is coextensive with at least claims 1-11 of the '641 Patent. The chart confirms that each of the claimed features are found in the MagBak wallets.

B. Commercial Success

404. It is my opinion that the commercial success of the Patent Owner's patented product demonstrates the nonobviousness of the claimed inventions. The MagBak Wallet launched on Kickstarter on November 5, 2018, with a $15,000 funding goal. The campaign was oversubscribed within three days. Over forty-five days, backers pledged $62,478 — more than four times the goal and well above the

threshold that only 1.7% of all Kickstarter campaigns have ever reached as of December 2021. EX2024, ¶10.

405. General preorder opened November 22, 2018, with shipping beginning February 6, 2019. In its first full year, the MagBak Wallet experienced 2,409.3% growth. Year-over-year sales growth continued at 163% between 2019 and 2020 and 69% between 2020 and 2021 — the latter figure achieved notwithstanding the entrance of well-funded competitive products. EX2024, ¶11.

406. The product now carries a 4.87-star average across more than 1,000 verified customer reviews, with reviewers specifically and repeatedly identifying the magnetic hold and on-phone positioning as the features driving their preference for the MagBak Wallet over competing products — including Apple's own heavily marketed alternative. EX2024, ¶19.

407. When the MagBak Wallet entered the market, it was a new product category. There were no magnetically connected wallets for mobile devices commercially available. EX2024, ¶12. That market vacuum is itself evidence of long-felt but unmet need —the consumer demand existed, and yet no one had produced a commercially viable product combining strong orientation-controlling magnetic arrays with a wallet that safely carried credit cards. The reason is

precisely what the '641 Patent solves: the card corruption problem that any PHOSITA would have recognized as the obstacle, and that no prior art combination teaches how to overcome.

C. Long-Felt But Unmet Need

408. The immediate demand for the product made by the patented technology demonstrates its nonobviousness. Smartphones were already ubiquitous by 2018, wirelessly charged, and carried by users who simultaneously needed to carry credit cards, identification, and cash. EX2024, ¶20. The need for a removable wallet accessory thin enough for a pocket, strong enough to stay attached during normal handling, and safe for the magnetic cards it carries was obvious to anyone who carried both a phone and a wallet — which is to say, essentially everyone. Yet the market contained no solution. The MagBak Wallet's immediate commercial success — oversubscribed in three days, 2,409% growth in year one — is the market's answer to how long that need had gone unmet and how directly the claimed invention addressed it.

D. Industry Skepticism

409. The skepticism the '641 Patent's inventors confronted was not vague commercial uncertainty. It was a specific, technical concern about whether strong magnets could be placed in a credit card wallet at all. A common consumer concern

— documented in contemporaneous Reddit threads and on the MagBak website itself — asked directly: "Won't the magnetic field erase the magnetic strip on the credit card?" EX2024, ¶21. This is not the skepticism of a lay audience unfamiliar with the technology. It is the same concern that a PHOSITA conducting a Failure Modes and Effects Analysis would have identified as the threshold barrier to the claimed combination.

410. Apple itself validated the legitimacy of this concern when it launched MagSafe in October 2020. Apple issued a formal warning — reported by Tom's Guide as serious enough to call MagSafe's "killer feature" status into question — stating: "Don't place credit cards, security badges, passports, or key fobs between your iPhone and MagSafe Charger, because this might damage magnetic strips or RFID chips in those items." EX2024, ¶23. Apple, a company with vastly more engineering resources than 1LSS, warned consumers to keep cards away from its magnets, is powerful evidence that the '641 Patent's solution was not obvious.

411. The K&J Magnetics blog, an industry-recognized source on magnet engineering, independently confirmed the underlying physics, noting that multiple magnets with a small gap between them "can produce a really strong magnetic field" and that this worst-case scenario is precisely what orientation-controlling

magnet arrays create. EX2024, ¶24. Industry sources thus corroborate both the magnet corruption problem and the non-triviality of solving it.

E. Copying by Competitors

412. On January 13, 2020, fourteen months after 1LSS launched the MagBak Wallet and while the technology was in active commercial deployment, Apple ordered three MagBak Wallets via expedited two-day shipping to Apple's headquarters at One Apple Park Way, Cupertino, California. EX2024, ¶26. Nine months later, on October 13, 2020, Apple introduced its competing MagSafe Wallet. EX2024, ¶25. Subsequent disassembly and analysis of Apple's MagSafe Wallet confirmed that it incorporated 1LSS's patented technology, the proprietary arrangement and configuration of magnets with specific alternating polarity regions that couple the wallet to the device in a specific orientation, as claimed in the '641 Patent. EX2024, ¶27; EX2025, Ex. B.

F. Unexpected Results

413. The most technically significant objective evidence is the unexpected results produced by the claimed combination of alternating-polarity magnetic arrangements and a ferromagnetic shield. A PHOSITA in 2018 would have expected these elements to trade off against each other — standard magnetic engineering treats field containment and attachment force as competing design

objectives. EX2024, ¶29. What the '641 Patent's architecture produces instead is synergy: the same component that protects the cards also strengthens the connection to the phone, and the two effects compound rather than trade off. EX2024, ¶36.

414. The mechanism, illustrated by the field-line diagrams, is magnetic reluctance. Air has high reluctance; the ferromagnetic shield has very low reluctance. Without the shield, field lines from the magnet array loop back through the wallet compartment, passing directly through the stored cards. EX2024, ¶30. With the shield, those field lines are offered a lower-reluctance return path through the shield material and are rerouted away from the card compartment entirely. EX2024, ¶31. As the field-line diagrams show, the gray lines representing the unshielded field that passed through the card compartment disappear in the shielded configuration, while the black lines representing the shielded field extend outward in larger lobes — rerouted, not eliminated. EX2024, ¶31.

415. The counterintuitive result emerges when the wallet is brought into proximity with the phone's magnets. The rerouted field lines, rather than looping back through air on either side of the wallet, now travel across the gap and through the phone's magnets, forming closed loops that span the wallet-to-phone interface. These cross-gap loops produce attachment force. Because the shield provides a low-

reluctance return path, the entire magnetic circuit closes more efficiently — and lower total reluctance in a magnetic circuit produces stronger attractive force across the air gap. The shield strengthens attachment. EX2024, ¶32.

416. The second set of field-line diagrams isolates the role of alternating polarity. A same-polarity design with a shield (top diagram) produces large, far-reaching field loops that extend well beyond the magnet array toward the card compartment. An alternating-polarity design with a shield (bottom diagram) confines its field to small, tight loops between adjacent magnets. EX2024, ¶34. The alternating-polarity arrangement starts with a fundamentally smaller stray field for the shield to manage — reducing field strength at the card compartment by an order of magnitude or more compared to same-polarity configurations, falling well below the damage threshold for high-coercivity credit card stripes and below the threshold at which low-coercivity stripes become vulnerable. EX2024, ¶33.

417. The result is a design where one architectural decision, the combination of alternating-polarity arrays with a ferromagnetic shield, simultaneously solves three distinct problems: it protects stored credit cards from magnetic corruption, it strengthens the wallet's attachment to the phone, and it enables deterministic orientation control that supports reliable kickstand and finger-

loop functionality. EX2024, ¶35. None of these results follows predictably from either element alone, and the combination of all three from a single integrated design decision is precisely the kind of unexpected synergy that the nonobviousness doctrine is designed to protect.

VII. CONCLUSION

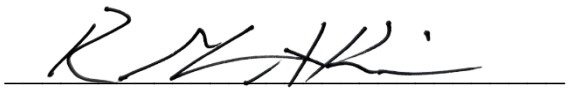
418. In connection with the above, I have reviewed, had input into, and endorse as set forth fully herein the nonobviousness analysis in the accompanying Patent Owner's Response showing that each element of Claims 1-11 of the '641 Patent are not rendered obvious by the prior art references set forth therein. I reserve the right to amend and/or supplement the foregoing opinions in accordance with applicable Patent Trial and Appeal Board rules, orders, and procedures.

419. In signing this Declaration, I understand that the Declaration will be filed as evidence in a review proceeding before the Patent Trial and Appeal Board of the U.S. Patent and Trademark Office. I acknowledge that I may be subject to cross examination over my opinions as set forth in this Declaration.

420. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so make are punishable by fine or

imprisonment, or both, under Section 1001 of the Title 18 of the United States Code and that such false statements may jeopardize the results of these proceedings.

DATED: May 1, 2026



R. Glenn Akhavein, P.E.

Appendix A: Expert's Curriculum Vitae

Akhavein & Associates

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

R. Glenn Akhavein, P.E.

Product Development, Forensic Engineering, IP, & Expert Witness Testimony

Professional Profile

Mr. Akhavein is a Professional Engineer possessing extensive knowledge in product development, forensic engineering, expert witness, Intellectual Property, (IP), and product design and manufacturing. With over 35 years' experience in mechanical engineering, he has performed numerous failure analyses and provided improved designs to enhance product development. His knowledge in electro-mechanical design has often been utilized in litigation in product liability, forensic analysis, product design, and IP. Mr. Akhavein holds several patents and his expertise has been sought after in commercial develop of IP and in both infringement and invalidity disputes.

Areas of Expertise

Mr. Akhavein provides technical services for companies and individual clients seeking help with product design and development, forensic analysis, litigation support, intellectual property support, product safety and liability, and new technology development and due diligence.

Experience includes but not limited to:

- Product Design and Development
  - Commercial
  - Industrial
  - Medical
  - Military
- Forensic Engineering
- Expert Testimony
  - Patent Infringement / Invalidity
  - Product Liability
  - Personal Injury and Wrongful Death
  - Class Action
  - Breach of Contract – Product Design, Design Services, and Product Development
- Reverse Engineering
- Prototyping and Prototyping Services
- Forensic Design Analysis – Analysis, Cost Reduction, IP Analysis, and Design Improvement
- Transportation Products – Auto, Aircraft, Bicycle, Marine, and Wheelchair
- Product Safety Analysis – Regulatory and Liability
- Finite Element Analysis – Computer Simulation
- Due Diligence
- Data Acquisition and Analysis
- Pneumatic Products
- Die Cast, Injection Molded, and Machined Parts
- Electronic Manufacturing and PCB Housing Design
- Power Train, winches, hoists

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

Education / Licenses

B.S. in Mechanical Engineering, North Carolina State University

Professional Engineer, FL 73171

The following are examples of SOME of the projects that I have worked on:

- Lifesync - Wireless ECG monitoring system – Lead Engineer, Systems and Mechanical Engineering including custom designed latching system, (ME), https://www.lifesync.com/
- OEM contact lens tray design – All ME, design and development of vac-formed and molded parts http://www.unilens.com/
- Next generation Humvee watertight turn signal – Lead ME , designed sealing system
- Next generation Humvee fuel valve seal – Engineering Consultant
- Electronic marine throttle design – Systems Engineer, ME
- RFID badge holder –ME and design – "2008 Good Design Award" http://www.idstronghold.com
- Electric scooter build for EICMA 2007 – Program Manager and Engineering Consultant
- ASO Corp: Nasal Dilator analysis and redesign – All ME, analysis, simulated and human testing, and redesign, analyze competitor's current IP, work with inhouse counsel on IP related issues http://www.asocorp.com/products/nasal-dilators/
- Acoustical evaluation and design consultant – Recommended design direction of new alarm design based on acoustical testing, (high volume cost reduction program)
- DARPA: Fuel Cell housing design – Redesigned, evaluated, and produced carbon fiber housing for in field fuel cell, (military application of new technology for DARPA competition)
- LEAR Corp: Design and IP Review – Worked with engineers and attorneys with a design review of LEAR's Snap-In TPMS Wheel Pressure Sensor in order to reduce costs and avoid potential IP issues.
- Handheld medical grade TENS stimulator – ME consultant, design analysis, and manufacturing documentation review
- Expandable Trocar – Design, prototype and testing of two expandable trocars, reusable and one-time use. Expandable trocar was specifically designed for abdominal surgeries and included integrated fiber optic lights and camera.
- Landscape Lighting Redesign – Redesigned existing landscape light to use high efficiency LED's
- Portable gas powered winch – Complete design, component and product testing, manufacturing analysis, and IP support of portable winch gas powered winch is designed for rescue and post disaster relief and outdoor sportsman, "2010 Red Dot Design Award" and "2010 IDSA Design Award" https://www.robrady.com/blog/robrady-design-reels-red-dot-rescue-wizard-0
- Folding Manual/Power Assist Bicycle – IP and Licensing Consultant "Spark 2009 Gold Design Award" https://www.youtube.com/watch?v=M0i8M4UWjZU

- Lead engineer of the ZIIVAA™ product - Design and tested various versions of device that eliminates menstrual pain, IP consultant, and worked with oversees contract manufacturer to resolve production issues http://ziivaa.com/
- Solar Air to Water System – Lead ME consultant evaluating various refrigeration technologies
- Dental mill for making crowns – Analysis and design modifications of 4-axis dental mill to bring it into OSHA compliance, and creation of their OSHA compliant instruction and safety manual
- Next Generation Crossing Gate – Lead engineer redesigning railroad crossing gate mechanism
- High voltage power line poles – Forensic analysis of current design and manufacturing methods for telescoping poles used for high voltage lines
- Midmark: Forensic analysis and redesign of medical autoclave for manufacturer. https://www.midmark.com/medical/products/instrument-processing
- Tervis Tumbler water bottle redesign – Forensic design analysis of hydration vessel for drinkware manufacturer. I reviewed their existing design a set up test program to evaluate the current issues they were having and recommended design changes. . I also reviewed their existing handle design, conducted FEA analysis and redesigned to make it more robust.
- Tervis Tumbler drinkware – Comprehensive forensic analysis of current manufacturing methods for drink ware manufacturer. https://www.tervis.com/collections
- Pneumatic Door Breacher – Complete redesign of pressurized door breacher for SWAT teams.
- Moffett Cancer Center: Design and IP research on medical glove for cancer research.
- B/E Aerospace, now Boeing: Airline flip down tray redesign – Forensic analysis, (mechanical and thermal), and redesign of airline flip down trays.
- Hi-lift Jacks: Forensic analysis of off-road style jack to help with EU regulatory issues. Used high-speed data acquisition sensors to profile the jack's characteristics in new, worn, and old scenarios and provided analysis. https://hi-lift.com/hi-lift-jacks/all-cast/
- Structural Design - Designed beam and bracket structures for high end speaker systems.
- Signaling device design - Designed, prototyped and tested portable rescue signaling device.
- F22 Raptor flight suit - Tested, analyzed, and redesigned portions of F22 Raptor respiratory system Raptor Return Article
- Recyclable wine keg invention - Designed, prototyped, and tested new recyclable keg system for wine manufacturers.
- Pel-State Fuel Services: Frac mining mobile pumping station design – Designed a complete automatic mobile pumping station for maintaining the fuel level in fracking equipment during a frac drilling operations; includes wireless data acquisition and control.
- Lockheed Martin: Exoskeleton redesign - Provide design consultation for new highly mobile exoskeleton for Lockheed Martin's FORTIS. Reviewed current design, completed stress/design analysis, suggested changes https://news.lockheedmartin.com/2017-04-20-Let-the-FORTIS-R-Tool-Arm-Give-You-a-Hand

- Fighter jet component – Reviewed design, manufacturing methods, and product documentation of classified military component to determine whether the product was built to specifications.
- B/E Aerospace, now Boeing: Military plane O2 generator redesign – Forensic analysis of current drop down O2 generators for planes that are sold commercially. Client wants to sell for military applications and needs design analysis, (stress and thermal), and redesign to survive more intensive military vibration profiles.
- Pot pipe redesign – Design review and conceptual redesign of a high end One-Hitter portable storage, grinder, lighter, and cleaner system for smoking marijuana
- Skeletal Dynamics: Distal humerus hemiarthroplasty – Design of new replacement elbow and entire surgical system, (implants, cutting guides, trials, tools, etc.), for medical device manufacturer. Work with physicians to design, prototype, test, conduct cadaver surgeries, and capture Intellectual Property for device manufacturer.
- ASO Corporation, Nasal dilator testing – Review design and function of nasal dilator and work with mfg to develop real world, functionally accurate method for comparison testing to brand product. http://www.asocorp.com/products/nasal-dilators/
- Wave Energy Converter – Design of a fully autonomous, 48-ton ocean going wave energy converter. Responsible for Project Management, product design, engineering, engineering analysis, stress analysis, fatigue and impact analysis, and basic CFD simulations. Assembled team of mechanical engineers and designers, electrical engineers, hydrodynamicists, fluid flow dynamicists, marine wiring, communications, control systems, marine corrosion and biofouling, among others.
- Penske: Automotive accident analysis – Forensic analysis of the entire brake system on a 2018 Isuzu NPT HD rental truck for Penske Rentals that was involved in an accident. Analyzed all of the brake components and function to determine what, if any, part of the braking system malfunctioned resulting in a rear end collision. Conducted the analysis and filed a report
- Hi-lift jack redesign analysis – Work with mfg to review possible design changes and to design experiments for evaluating changes and verifying regulatory impact relating to meeting ASME standards. http://www.hi-lift.com/hi-lift-jacks/index.html
- Co-founder and CEO of MediMags magnetic therapeutic bracelets – Mechanical design, Industrial design, engineering, FEA analysis, product testing, sourcing, and manufacturing support for new magnetic therapeutic bracelet that alleviates the pain associated with menstrual cramps. https://medimags.com/

Honors and Awards

- Portable gas-powered winch, Sportsman / Rescue – Lead Engineer
- • 2010 IDSA Design Award • 2010 Red Dot Design Award
- RFID badge holder –ME and design "2008 Good Design Award"
- Folding Manual/Power Assist Bicycle – Engineering and IP Consulting, "Spark 2009 Gold Design Award
- Fortis Exoskeleton – Stress analysis and redesign, "Spark 2014 Gold Design Award"

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

Litigation Experience

Stats: 25 Plaintiffs cases - 10 Defendants cases - Filed 36 Reports - Deposed 17 Times,

I have never had any or all of my testimony or opinions disqualified, nor have I ever been disqualified as an expert.

Intellectual Property Cases

- Intellectual Property – Patent infringement case, evaluated competitive products and filed Markman report for the defense. Washington Western District Court, Amphipod v. Penguin Brands, Inc., Case No. 2:2008cv01443, (filed report for Defendant in this case).
- Intellectual Property – Patent infringement case, evaluated competitive products, used CMM and solid modeling software to analyze competitor's products and filed declaration for plaintiffs. United States District Court for the Southern District of New York, Penguin Brands v. Impuls Footcare, LLC, Case No. 11-CIV-2453-BSJ-KNF, (filed report in this case).
- Intellectual Property –Patent infringement suit and countersuit involving truck tonneau covers. Analyzed Plaintiff's and Defendant's products, wrote infringement, invalidity, and rebuttal reports for Defendants. Wisconsin Western District Court, Extang Corp v. Laurmark Ind., Case No. 12-cv-372, (filed 3 reports and deposed 3 times).
- Intellectual Property – Case involving alleged infringement of design patent. Manufacturer of high end ceiling fans is alleging Defendant's new fan design infringes upon their design patent. Conducted forensic and design analysis of both products and wrote report for the Defendant' counsel.
- Intellectual Property – Case involving alleged infringement of multiple patents for single use medical lancets. Manufacturer of single use medical lancets sued over patent infringement. Conducted forensic and design analysis of both products, took detailed measurements including high speed firing force measurements, and wrote report for Plaintiff's counsel. United States District Court for the Southern District of Florida, Stat Medical vs. HTL-Strefa, Inc., Case No 15-20590-CIV-Moreno.
- Intellectual Property – IPR case in Ninebot, (current owners of Segway), v. Inventist Inc. Analyzing current design of the One S2, for Ninebot in the matter of the *Inter Partes* Review U.S. Patent No. 8,807,250. Compared the design and control system of the One S2, (http://www.ninebot.com/Product-s2.html), and compared that to the claim language within the '250 patent and filed a declaration on behalf of Plaintiff, Ninebot.
- Intellectual Property – The two largest wheelchair manufacturers, Invacare Corp v. Sunrise Medical, are suing over patent infringement regarding an anti-tipping suspension system for motorized wheelchairs. Defendant, Sunrise, has hired me to evaluate the designs and patents. Filed an Invalidity report regarding seven Invacare patents and was deposed in the case.
- Intellectual Property – A US manufacturer of cable rail barriers is being sued over patent infringement by another company and I have been retained by the Defendant's attorneys to

support both non-infringement and invalidity contentions. Filed both an Invalidity and a Non-Infringement report and was deposed twice.

- Intellectual Property –Case involving Shark Ninja and Dyson. Reviewed current claim construction filing and have written first claims construction report for Plaintiff, SharkNinja. I filed a Claim Construction declaration for the Plaintiff, SharkNinja, and have been deposed in this case.
- Intellectual Property – ITC case involving my client suing the largest manufacturer of nasal irrigation devices in the world, Navage. Responsible for review of five patents, creation of claims charts, complete functional testing, and infringement report, along with anticipated rebuttals to opposing counsel's invalidity and non-infringement reports for Plaintiff.
- Intellectual Property – A US manufacturer of cable rail barriers is being sued over patent infringement by another company, and I have been retained by the Defendant's attorneys and asked to provide my opinions on the proper claim construction and possible indefiniteness of certain disputed claim terms at issue in this case.
- Intellectual Property – IPR case representing client against Apple in a matter involving magnetic wallets for smart phones. Reviewing Apple's IPR petition and their expert's declaration and will file report for Client.

Personal Injury / Wrongful Death Cases

- Personal Injury – Evaluated testimony and depositions, used forensic analysis of available evidence to determine type of heater, used a systematic failure modes and effects analysis to determine possible failure modes, and then filed report for the defense in a liability case involving spa heater product design and alleged negligence. Superior Court of the State of Arizona, White v. La Reserve Villas, Case No. C2005-3728, (filed report, deposed, and testified in this case).
- Wrongful Death – Case involving the death of a dump truck driver that was killed when a tarp arm fractured and struck him in the head. Analyzed the broken tarp arm, manufacturer's installation and service manuals, and three depositions to determine root cause of failure and distinguish between manufacturing defect, design defect, or safety related application deficiencies for the plaintiff. District Court of Rockwall County, TX, 382nd Judicial District, Case No 1-09-728, (filed report in this case).
- Personal Injury – Forensic analysis in product liability case involving the explosion of a jar of fruit that significantly injured the plaintiff resulting in plastic surgery. Analyzed the product to determine cause of explosion, reproduced and confirmed hypotheses using computer simulations, (Finite Element Analysis), data acquisition instruments, and high speed photography. Wrote report for Plaintiff's counsel.
- Personal Injury – Product liability case involving the failure of a mountain bike that ejected its front wheel and resulted in serious injury to the rider. Analyzed the design, actual product, and exemplar product to determine the failure mode(s). Wrote expert report Plaintiff's counsel, resulted in 1 million bike recall.
- Wrongful Death – Case involving a failed gas spring used in a GM plant. The gas spring blew apart with the cylinder end lodging in an employee's head. This case involves the analysis

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

and testing of the gas spring, the application it was used in, and degerming failure mode(s) of the system. Wrote a report for the Plaintiff and was deposed in this case.

- Wrongful Death case – Forensic analysis of an "Ironworker" 60 ton multifunction hydraulic press that was responsible for the death of an operator. I conducted a complete design analysis of the machine to determine if there were any inherent design defects and/or a failure to notify that contributed to the death of the operator and filed a report for Plaintiff with my findings.
- Personal Injury – Case involving a fryer that tipped over and severely burned the plaintiff. This case involves a safety review of the product and its design, as well as a forensic analysis of the design and how that affects the fryer's stability. Conducted a complete design analysis of the product and submitted a report for Plaintiff.
- Wrongful Death– Case against Ford Motor Co. and Konecranes. This case involves the computer analysis and actual testing of plywood flooring of a crane crow's nest that broke resulting in the death of the crane inspector. Case settled after opposing Plaintiff's counsel received my preliminary findings and just prior to my deposition.
- Wrongful Death – Current case involving an accident where an inflatable raft used for "Tubing" was responsible to a boating accident. This case involves analysis of the inflatable raft, review of supplied information and warnings, and the OEM's failure to properly notify. Creation of solid models used for computational fluid dynamic analysis to determine drag and lift forces on the raft during transport and followed up with actual dynamic load force testing.
- Personal Injury – Client purchased microwaveable slipper's and alleges that there was insufficient information provided with the product that resulted in burns and subsequent amputation. Working with plaintiff's counsel and developed complete testing protocols for accurately testing the product and submitted a final report for Plaintiff on test findings.
- Personal Injury – New case involving burns from an electric blanket that allegedly malfunctioned or was simply designed in a manner that allows it to get too hot. Completed forensic design analysis and thermal testing to profile the blanket's heating and control system.
- Personal Injury – Client was injured by an auto-feed drain cleaner that was rented from Home Depot. Will conduct entire analysis of exemplar unit on site and file report for Plaintiff.

<u>Product Liability without Injury</u>

- Product Liability – Civil suit involving the explosion of a manway cover in a hydrated lime silo accident. Retained as expert and will be conducting a forensic analysis of the silo manway, manway cover, and lime off-loading truck, (filed report for Plaintiff and deposed).
- Product liability – Conducted a forensic analysis of an ice maker that failed resulting in significant property damage. Conducted analysis and consulted with client detailing failure mode and estimated time when failure happened, (Wrote report for Defendant's counsel).

- Product Liability – Forensic engineering analysis in a product liability case involving a tortilla chip warmer that was involved in a fire. Analyzed work done by fire investigators, analyzed exemplar unit, and conducted thermal testing. Reviewed design and evaluated potential design issues that led to the fire, (filed report for Plaintiff and was deposed).

Class Action

- Class Action Suit against Apple – Evaluated computer component design, development process, forensic analysis of design and manufacturing processes, and provided expert report for the plaintiffs. United States District Court for the Northern District of California, Plaintiffs v. Apple Inc., Case No. C 09-01911, (filed report for Plaintiff in this case and deposed).
- Class Action suit against Sony – Class action case against Sony and Best Buy involving laptop touch pads. Currently working with Plaintiff's counsel on seeking class status. United States District Court for the Southern District of California, Case No. 09-CV-2109 AJB (MDD), (filed 4 reports and deposed twice in this case).
- Class Action suit against Honda – Class action case involving window regulators for various models of Honda automobiles. This case involves product analysis, DFMEA analysis, functional and destructive testing, and final report for Plaintiff.
- Class Action Suit against American Standard– Evaluated product and development process, reviewed reports and depositions, and provided expert reports for plaintiffs. United States District Court for the District of New Jersey, Stephen Laney v. American Standard Corporation, Inc., Case No. 07-3991, (filed report for Plaintiff and was deposed in this case).

Trade Secret / Breach of Contract

- Trade Secrets and Trade Dress Case - Evaluated vacuum cleaner company's products and processes, completely analyzed defendant's product, design, and filed report for the prosecution stating the likelihood that the defendant was able to complete the development with the given resources without the use of proprietary information. United States District Court for the Southern District of California, Aerus LLC. v. Pro Team Inc., Case No. 05CV1065-B, (filed reports for Plaintiff and was deposed in this case).
- Product Development process breach of contract – Civil suit and countersuit involving the design, prototyping, testing and manufacturing of an LED based flare system. Analyzed claims and counter claims and four years' worth of emails and submitted a report regarding what is normal and customary in the contract engineering industry. United States District Court for the District of Nevada, Jerry Laidman vs. Total Flare, Inc., Case No 2:11-cv-00704-LRH-PAL, (filed report for Plaintiff in this case).
- Product Development process – Case in England where I was hired by the Claimant, D-Fly Group, to evaluate the product development process that the Defendant, DCA Design Int., conducted to conceptually design, actually design, prototype and test a new high end electric scooter, The Dragonfly PEV, and help determine if the Defendant lived up to their

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

contractual obligations in the development process and to help with Scott Schedule for the High Court of Justice, Business, and Property Courts of England and Wales.

- Product Development process breach of contract – Civil suit involving military automatic life vest inflators used aboard naval vessels and by pilots. Representing the Defendant's in a case where they are alleged to have not provided the contracted deliverables. Will analyze the contracts and technical documentation and file a report on behalf of the Defendants.

Patents

Patent Applications:

20230132840	Magnetic Therapeutic Bracelet
20190133346	Apparatus for a combination auto visor and desk photo frame
20120186273	Produce Refrigeration Chamber
20120043148	Folding bicycle with electric power train assist
20110215285	Gas powered self-contained portable winch
20110041839	Compression undergarment for relief of menstrual pain and related method of use
20110015708	Method and apparatus to relieve menstrual pain
20050131598	Machine sensor with redundant data logger OEM data logger
20050130514	Simplified flushing system
20050081927	Flushing system
20030127948	Apparatus having a pair of opposing surfaces driven by a piezoelectric actuator
20020014813	Apparatus having a support structure and actuator
20020000518	Linear motor having piezo actuators
20010030306	Apparatus having a pair of opposing surfaces driven by a piezoelectric actuator
20010029828	Method and system for automatically tuning a stringed instrument

Issued Patents:

10149780	Compression undergarment for relief of menstrual pain and related method of use
8473130	Folding bicycle with electric power train assist
8434742	Gas powered self-contained portable winch
8191550	Method and apparatus to relieve menstrual pain
D617,687	Folding bicycle
6945835	Flushing system and process
6836056	Linear motor having piezo actuators
6737788	Apparatus having a pair of opposing surfaces driven by a piezoelectric actuator
6717332	Apparatus having a support structure and actuator
6548938	Apparatus having a pair of opposing surfaces driven by a piezoelectric actuator
6437226	Method and system for automatically tuning a stringed instrument

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

Work History

Product Development Expert / Forensic Engineer / Litigation Support, Akhavein & Associates, LLC, Bradenton, FL - 2000 – Present

Providing technical services for individual clients seeking help with product design and development, forensic analysis, litigation support, intellectual property support, product safety and liability consulting, and new technology due diligence.

Senior Lead Consultant, Kevin Kennedy & Associates, Bradenton, FL – 2005– 2015

Providing technical services for individual clients seeking help with product design and development, forensic analysis, litigation support, intellectual property support, product safety and liability consulting, and new technology due diligence.

Senior Mechanical Engineer, ROBRADY Design, Sarasota, FL – 2006 – 2011

Responsible for mechanical engineering consulting in product design, development, rapid prototyping, and project management. Providing engineering analysis, research and development, and intellectual property consulting to clients in the consumer products, medical, industrial, transportation, military and other fields.

R&D Engineer, Viking Technologies, Sarasota, FL - 1999-2000

Responsible for all mechanical engineering functions for contract engineering and internal R&D. Created, designed, developed, patented, and test products in the areas of high-flow low-power piezo driven pneumatic valves for industrial and military applications. Also developed low power high force and precision linear motors for industrial applications and specialty applications in the music industry. Used SolidWorks solid modeling software for all designs. Personally did the high precision machining for prototypes. Can build, install, upgrade, and troubleshoot PC's and Laptops.

Engineering Manager, Protek Electronics, Sarasota, FL- 1998-1999

Managed engineering department for contract electronic manufacturing company. Responsible for all aspects of the department, personnel, budget, project priorities, training, etc. Responsible for technical contract review quoting engineering time for design engineering services. Responsible for the mechanical portion of all design and development projects including molded and sheet metal circuit board housings. Used MS Project for scheduling and tracking projects. Developed Engineering Change procedures for the company, as well as proper PDM.

Akhavein & Associates, LLC
5112 Coral Blvd.
Bradenton, FL 34210
941.704.8622

Senior Project Engineer, **Pneumatic Division, Parker Hannifin Corp** Wake Forest, NC- 1996-98

Lead Engineer for product centered design and engineering projects. Led New Product Development Program teams and scheduled/monitored projects. Worked closely with Manufacturing and Marketing to develop new "Global" products and supported existing products. Experienced with all aspects of managing projects from concept through completion. Designed new products, supervised engineers and drafters, and acted as primary contact for various product lines. Designed die cast, injection molded, and machined parts and elastomeric seals. Led design/change reviews, maintained UL, CSA, and CE files, and resolved engineering/manufacturing issues at the Wake Forest, NC and Canton, PA manufacturing facilities. Experienced with Pro/Engineer and AutoCAD /MechDesktop. Very proficient with MS Office, MathCAD, and many other PC programs. Departmental contact for purchasing and maintaining PC's.

Engineering Supervisor, **Pneumatic Division, Parker Hannifin Corp.** Wake Forest, NC- 1992-96

Supervised daily activities of the Product Engineering department. Scheduled work for engineers and drafters and set priorities for engineering changes, product releases, and special product development for large OEM's as well as automotive industry applications. Chaired Engineering Change Committee at NC and PA manufacturing facilities and worked closely with manufacturing and purchasing to reduce product costs.

Engineering Graphics Supervisor/Project Engineer, **Kennametal Inc.** Raleigh, NC. - 1991-1992

Design Supervisor, Kennametal Inc. Raleigh, NC. - 1989 – 1991

Designer, **Kennametal Inc.** Raleigh, NC. - 1988 – 1989

College Work Experience, Honors and Activities

- Sound Survey Engineer
- Math, Chemistry, Physics Tutor
- Nautilus Instructor / Personal Trainer
- Design Engineer and Machinist
  Award Winning Turkey Egg Vaccination System
  https://www.embrexbiodevices.com/
- Defensive Back – NC State Football Team
- Student Body Senator NC State
- Member of Sigma Chi social fraternity
- Executive Committee on Minority Affairs