Question 1: Validity

Patentable Subject Matter

Under § 101, patentable subject matter includes "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." Patentable subject matter does not include inventions that claim laws of nature (*Prometheus*), physical phenomena (*Parke-Davis*), or abstract ideas (*Alice*).

Here, a challenger to the '123 patent would argue that the invention claims a physical phenomenon (i.e., that a coil of wires creates a magnetic field which is interrupted when metal is within the range of the coils) and that the invention simply captures that phenomenon. Pat can respond that the invention claims an unconventional application of that physical phenomenon, not just the phenomenon itself (*Alice*). Pat has a strong argument that, on some level, all patentable inventions are directed towards physical phenomena or laws of nature, and at the appropriate level of abstraction the invention does not claim the phenomena itself. Pat has a strong argument against any patentable subject matter challenge.

Utility

Under § 101 and 112, inventions must have beneficial, operable, and practical utility at the time a patent application is filed. Beneficial utility prevents patenting of frivolous or immoral inventions (*Lowell*). Operable utility prevents patenting of inventions that are inherently unbelievable to a PHOSITA (like a perpetual motion machine). Practical utility requires that an invention have a well-defined, particular, and presently available benefit to the public (*Brenner*).

Here, Pat's invention has beneficial utility, as it is not frivolous or immoral. Rather, it aims to provide a more portable and convenient method for metal detecting.

Pat's '123 patent likely has operable utility. A challenger would argue that the '123 patent lacks operable utility because Pat has never been able to reduce it to practice (Pat filed his application "without ever building a prototype"). Further, the Reddit thread discussing the invention pointed out many issues with the sandal metal detector (its short range of detection, bad ergonomics, etc.) and many commenters thought it was a scam. While Pat claimed an invention slightly different from the Kickstarter sandal, a challenger would argue that many of the same issues are still present in the '123 patent, so the patented invention is also not operable. Pat can respond that the test for operability is whether the invention is "inherently unbelievable," not whether the invention is practical (*Ex parte Cheeseborough*), and one of the Reddit users even said that his invention looked "completely reasonable" (as provided in the facts, "some people thought the prototype was real"). Because the metal detecting shoe is not a fantastic, inherently unbelievable invention, Pat will likely establish operable utility.

Finally, Pat's '123 patent likely has practical utility. Practical utility requires both specific (well-defined and particular to the invention) and substantial (immediately available to the public) utility. For specific utility, Pat provides in the specification that the invention provides a convenient, inconspicuous method for metal detecting. For substantial utility, a challenger would argue that there is no benefit readily available to the public, as Pat has not created a prototype and the invention would be "wildly impractical" as argued on the Reddit thread. Pat can respond that the invention has substantial utility because, while the invention requires further development, that development is merely to create a working protype, not to discover a use for the product. Moreover, the requirement of "immediately" available benefit has not been interpreted as strictly as it sounds (see *Brana*).

Disclosure: Enablement, Written Description, Definiteness

Enablement

An inventor must describe the invention clearly enough that a PHOSITA can make and use the invention without undue experimentation. "Undue" experimentation means that some gap-filling to the PHOSITA is allowed. Whether the amount of experimentation is undue depends on the quantity of experimentation necessary, the amount of direction or guidance presented, the presence or absence of working examples, the nature of the invention, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art, and the breadth of the claims (*Wands*).

Here, for claim 1, a challenger to the '123 patent would argue that the absence of a working example weighs against enablement, and the specification does not provide direction or guidance on how to embed and configure the elements in a shoe, requiring undue experimentation. Pat can respond that the state of the art is quite developed (as Pat says in the specification, "[t]he metal detector market is a fairly large one") and a PHOSITA would know how these components operate in other metal detectors and thus can fill the gaps on how to arrange and embed them in a shoe sole. Pat would argue that the specification also provides drawings showing the configuration of the components. Further, even if more than half of the attempted implementations would fail, this does not weigh definitively against enablement (*Atlas v. DuPont*).

For claim 2, a challenger would argue that the term "outside of the shoe's sole" would require undue experimentation by a PHOSITA to determine where to place the electronic module and power source. Pat can respond that there are a very limited number of options for where to place the electronic module and power source, and therefore a PHOSITA would not need to engage in undue experimentation to determine where to place them. Pat also did provide some

direction for how to arrange the components on the outside of a shoe in the specification ("in an outside pouch"). Given the state of the prior art, the relative skill of PHOSITAs, and the description of this implementation in the specification, Pat has a strong argument that the patent is enabled.

Written Description

Under § 112, the written description must clearly allow PHOSITAs to recognize that the inventor invented what is claimed (i.e., had **possession** of the claimed subject matter as of the filing date) (*Ariad*). Here, a challenger would argue that claim 2 is too broad, effectively expanding the scope of the patent to claim shoes that have the module and power source located anywhere in or on the shoe, but that the only figure depicting the module and power source elements shows them inside the sole of the shoe. A challenger might also argue that Pat did not possess the invention because he did not have a prototype when he filed.

Pat can respond that the specification explicitly states that the battery can be packaged within, on, or outside the shoe, and that the figure simply provides one example. Accordingly, the specification would reasonably convey to a PHOSITA that Pat possessed the claimed invention. Further, neither examples nor actual reduction to practice are required for adequate written description.

Definiteness

A patent must also particularly point out and distinctly claim the subject matter in order to provide a clear warning as to the patentee's property rights. A patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform a PHOSITA with reasonable certainty about the scope of the invention (*Nautilus*). Here, a challenger would argue that the claimed element "an electronic

module for controlling power to said coils and receiving signals from said coils…" is an indefinite means-plus-function claim because "module" is a nonce word and Pat did not define it in the specification.

Pat can argue the claim is not a means-plus-function claim because "module" is not a nonce word at all, but a well-defined electronics component containing semiconductors and other devices (as a PHOSITA would know). Even if "module" was construed to be a nonce word, Pat may be able to argue that it is described in the specification as having a "dial" and a "turn switch" that control the power supply and signal calibration. Further, prosecution history is relevant in a definiteness analysis (*Nautilus*), and Pat amended claim 1 to include a description of the electronic module to overcome an indefiniteness rejection. Accordingly, Pat has a strong argument here that his claims are sufficiently definite.

Novelty

Under § 102, a patent can only issue if it is novel in light of the prior art. Determining novelty requires ascertaining the universe of prior art, excluding art subject to exceptions, and determining whether any of the remaining prior art anticipates the claimed invention.

Critical Date

Under the AIA, an invention's critical date is its date of filing. Therefore, the critical date of the '123 patent is May 31, 2014.

Universe of Prior Art (102(a))

The '533 patent is prior art under § 102(a)(2) because it was filed and issued as a United States patent. Its effective date is its filing date. The filing date is not provided, but the patent was issued in 1981, so we know that the inventor must have filed before December 31, 1981.

Other prior metal detectors are also prior art because they have been in public use "for generations" and have been on sale. Since the '533 patent was likely an improvement on prior metal detectors, these prior metal detectors would have entered the art no later than December 31, 1981 as well.

Pat's Kickstarter page may be prior art under § 102(a)(1). Cases suggest that webpages will be included/excluded as prior art using the same principles applied to traditional printed publications (see *SRI Int'l*). An argument to exclude the webpage for Pat's Kickstarter campaign might posit that the page was not sufficiently publicly accessible to count as a publication (only had 6 backers and was only posted for 6 months). This argument will likely fail, though, and the webpage will likely be considered "catalogued or indexed in a meaningful way" because it gained 6 "backers" and did raise some funding, indicating public accessibility (*SRI Int'l*). It was also picked up and shared on the Reddit thread, further indicating public accessibility. Further, lack of funding is not necessarily due to lack of accessibility (see the Reddit thread – this might just be a bad idea). Finally, *SRI* considered a slideshow that was only posted on the Internet for 7 days; 6 months is much longer. In any case, the effective date for this webpage is likely the date that Pat created his Kickstarter project, June 1, 2013 (unless for some reason it was not indexed and available until a later date).

The '456 patent is also prior art as a patented invention. Under § 102(a)(2), a patent application filed before an invention's critical date is prior art as of its filing date if it eventually publishes. Under the AIA, US patent applications are backdated to their foreign application date if the foreign patent is filed in the US within one year of the foreign filing. The French inventor filed in France on July 1, 2013 and field in the US on July 1, 2014. (One year exactly?! I am

assuming that this falls within the 1-year period.) Thus, the effective date for the French patent is July 1, 2013.

The French boot application is also prior art as a printed publication because the French application was published. The effective date for the application as a printed publication is January 1, 2015. The picture of the boot released by the French manufacturer is also prior art with an effective date in June 2014.

The Flip-Flop Find is also prior art because it is in on sale in her "metal detection sandal business" and is also likely in public use. Because Trina started this business in 2018, her sandals would have entered the prior art no later than December 31, 2018.

Exclusions from Prior Art

Pat's Kickstarter page will be excluded from the prior art under § 102(b)(1) because it is attributable to Pat and has an effective date of less than a year before Pat's filing date.

The French boot patent application will not be considered as a printed publication because it is belated; the critical date of the '123 patent is May 31, 2014 and the French patent did not publish until January 1, 2015. The picture of the French boot will also be excluded because it has an effective date of (at the earliest) June 1, 2014, which is after May 31, 2014. Likewise, the Flip-Flop Find will be excluded from the prior art because its critical date is December 31, 2018.

Anticipatory Prior Art

In order to anticipate a claimed invention, a single prior art reference must disclose each element of the claimed invention (*Structural Rubber Products Co*.). For anticipatory purposes, prior art from all fields is considered and the patentee's claims are compared to the entirety of the prior art product, patent, application, or publication. Here, the elements of the '123 patent

include (1) coils, (2) an electronic module, (3) a power source, and (4) buzzers and LEDs. The elements of both claims are the same, but some differ in location.

The remaining prior art (not excluded under § 102(b)) includes the '533 patent, prior metal detectors, and the '456 patent.

The '533 patent contains coils, a wire which delivers power to the coils and sound to a speaker, a battery, and a speaker. A challenger arguing that this anticipates Pat's '123 patent might argue that the wire counts as an "electronic module" because it controls the power supply to the coils and transmits the sound to the speaker. However, the '533 patent does not contain buzzers or LEDs, so it does not anticipate.

Prior metal detectors also do not anticipate because they contain coils, a power source/control circuitry, and some signaling mechanism. Because no single metal detector is provided that has buzzers, LEDs, and a battery, no single metal detector anticipates under these facts.

Patented prior art (unless it is also prior art as a printed publication) is a reference only for what is patented and not for what its specification discloses (*Reeves Bros*.). Because the '456 French application is not prior art as a printed publication, only its claims are considered in an anticipation analysis. The patent claims coils, a control module/battery, and a buzzer/notification system. A challenger would argue that the '456 patent claims all elements that the '123 patent claims. Pat can (likely successfully) argue in response that claim 1 explicitly has the module and battery located within the sole of the shoe, and in the '456 patent these elements are located on the outside of the boot. Because Pat's claim 2 has the module and battery located outside the shoe, Pat faces a tougher argument that claim 2 is not anticipated. If he can show that the "notification system" of the '456 patent does not contain LEDs, he may have an argument

against anticipation because he specifically claims LEDs. It should be noted that a prior art reference generally must enable in order to be anticipatory (*In re Hafner*), so a challenger would need to argue that the '456 patent is enabling in order for it to anticipate claim 2 of the '123 patent.

Obviousness

A challenger to the '123 patent would also challenge it as obvious. Obviousness assesses the technical, not economic, triviality of the patented invention and asks whether a PHOSITA faced with the same problem would select the patented elements to combine (Graham). Under Graham, an obviousness analysis includes:

(1) Determining the scope and content of the prior art

(2) Ascertaining the differences between the prior art and the claims at issue

(3) Finding the level of ordinary skill in the art (the PHOSITA is presumed to have full knowledge of all prior art)

(4) Determining obviousness of the subject matter to a PHOSITA, and

(5) Considering secondary factors.

First, the references that were prior art under § 102 are also prior art under § 103 if they are pertinent references in the analogous art (Clay). The invention's pertinent art is metal detecting, and all of the references under § 102 are within the art.

Second, the differences between the prior art claims and the '123 patent are that the '123 patent contains the elements in a shoe, and with the exception of the '456 patent, the prior art does not contain metal detection in the form of a shoe. The main difference between the '456 patent and the '123 patent is that the '123 patent claim 1 contains all elements inside the sole of the shoe.

Third, a challenger would argue that the level of ordinary skill in the art is an electrical engineer, while Pat will likely argue that the level of ordinary skill is a lay metal detecting enthusiast. The facts indicate that a PHOSITA would know how to construct all of the components of a metal detector, but it is unclear how a court would rule outside of this description. A challenger could argue that the "fairly large" metal detecting market and continued development among metal detecting technology indicates a higher level of skill.

Fourth, Pat faces a tough argument for non-obviousness with the '456 patent. As stated above, the difference between the '456 patent and claim 1 of the '123 patent is the location of the control system and battery. A challenger can easily argue that, in light of the '456 patent, it would be obvious to a PHOSITA to move these elements into the sole of the shoe. Even if the lack of LEDs in the '456 patent allowed Pat to survive claims of anticipation for claim 2, a challenger will successfully argue that the addition of LEDs is obvious.

Secondary considerations are not very relevant here; lack of success on Kickstarter and the critical Reddit thread indicate that this is not really a long-felt unresolved need. Commercial success is also not present here.

Accordingly, a challenger would likely succeed in an argument that the claims of the '123 patent are obvious in light of the prior art.

Question 2: Infringement Claims by Patent Holder

Under 271(a), literal infringement requires that all elements in a claim be present in the allegedly infringing device. First, the claims must be construed by a court (*Markman*).

The claim language is often the starting point for an infringement analysis. Intrinsic evidence like the specification and prosecution history can also be relevant in construing claims; extrinsic evidence can be used if ambiguities exist in light of all intrinsic evidence (*Markman*).

Claim 1

It is unlikely Pat will argue that the Flip-Flop Find (FFF) literally infringes claim 1 of the '123 patent because the FFF does not have the module or battery located in the sole of the shoe.

Even if there is no literal infringement, Pat will still argue that Trina's FFF infringes the '123 patent under the doctrine of equivalents. A DOE test proceeds on an element-by-element basis and is evaluated at the time of infringement (*Warner-Jenkinson*). The triple identity test can be used to determine if two inventions are equivalent (do they serve the same function, in the same way, for the same result). Here, Pat will argue that the location of the components in a box strapped to the user's leg achieves the same result (hands-free metal detection) as his invention where the components are located in the sole of the shoe, and they operate together in substantially the same way (using metal detecting components connected to a shoe). Trina faces a tough argument here, but she can respond that strapping the components to the user's ankle instead of putting them in the sole establishes that the FFF operates in a sufficiently different "way" to avoid infringement under DOE.

Claim 2

Pat will claim that Trina's product literally infringes because it contains coils in the front sole, a battery and module outside of the shoe's sole, and lights hooked up to the shoe. Trina can argue that the FFF does not have buzzers as part of the notification system, so there is no sound that can be heard when a metal detection is made. She can also argue that her lights are not "attached to the shoe" because they are on the box strapped to the user's leg. Pat will likely respond that the wire connecting the box to the shoe is sufficient "attachment."

If Trina's argument against literal infringement because of the lack of buzzers is successful, Pat has a strong argument for infringement under DOE because the FFF and the buzzer both achieve the result of creating sensory alerts by alarming a user that metal is detected.

Question 3: Pre-AIA

For novelty, the date of "invention" or reduction to practice is the critical date for the '123 patent. Because Pat did not actually reduce the invention to practice (e.g., still does not have a working prototype), his filing of a valid application constitutes a constructive reduction to practice, the critical date actually would not change here (still May 31, 2014). Pat may try to argue that the launch of his Kickstarter campaign was reduction to practice, but he merely jammed a power switch and a fake battery meter into the side" of a 3D printed sandal, so this would not count as reduction to practice.

The '456 patent would have an effective date of July 1, 2014, which would disqualify it from the universe of prior art. Under the '52 Act, because the French patent was filed in French, not under the PCT and without U.S. designation, it is not prior art until its U.S. filing date. This is after the critical date for the '123 patent and therefore is not prior art with respect to Pat's invention. Interestingly, the switch from AIA to pre-AIA effectively takes this analysis from a "first to file" one and makes it into a "first to file in the U.S." analysis. Because the '456 patent would be excluded from prior art, a challenger to the validity of the '123 patent would lose the strongest arguments for obviousness and lack of novelty. Pat's '123 patent is much more likely to withstand novelty and non-obviousness challenges under the '52 Act.

Because both the '123 patent and '456 patent were processing in the U.S. at the same time, they would likely implicate 102(g)(1). Because Pat filed first, Pat has the advantage of being the "senior party" in the interference. The French inventor (the junior party) would need

to argue priority of conception in order to beat Pat in the interference, but some evidence other than the inventor's own testimony would be necessary to establish proof of prior conception (*Brown v. Barbacid*, *Price v. Symsek, Mikus v. Wachtel*). A court would judge the junior party's evidence under the "clear and convincing" standard (but the senior party's under the "preponderance of the evidence" standard). To establish conception and claim an earlier priority date than their filing date, either party would have to show a "definite" and "permanent" idea of the "complete" and "operative" invention.