

Q1: Validity of the '123 Patent

The validity of a patent can be challenged on subject matter, utility, adequacy of disclosure, novelty/anticipation, and obviousness.

1. Subject Matter

There is no strong argument that the '123 lacks patentable subject matter. Though, because laws of nature (Prometheus), abstract ideas (Alice), and natural products/physical phenomena (Parke-Davis) are excluded from patentable subject matter, it's *possible* that someone may argue the invention relies on the natural phenomena of metal interfering with magnetic fields. However, this argument is easily countered by the '123 patent's disclosure is a device that incorporates principles of those laws of nature, but includes novel/non-obvious elements as to the construction, design, and application of the invention.

2. Utility

Under § 101, patentable inventions must have a beneficial, operable, and practical utility. Beneficial utility is found where an invention is not immoral or frivolous in nature, which is clearly evident here.

Operable utility is found where a PHOSITA finds the invention *not* inherently unbelievable, intended to bar fanciful claims. There is a presumption of operable utility, and regardless of the presumption, Pat's invention is an improvement or alteration on a previously existing technology. It is possible a challenger could argue that the Kickstarter thread shines doubt on the operable utility, but in my estimation this does not actually speak to the "inherently unbelievable" nature of the invention, but just the reservations of some individuals as to the possibility of success.

Practical Utility requires an invention to possess a specific (well defined and particular) and substantial benefit (significant and present available) to the public. Practical utility is also evident in the '123 patent disclosure, as the stated purpose is to provide a metal detector that is “convenient to use and draw less attention from the passersby. Instead of leaving the site with a hunched back or weary arms all that a user must do with the portable metal detecting shoe is walk around wearing them and wait for a signal.” ('123 Patent)

3. Adequate Disclosure

For a patent to possess an adequate disclosure under § 112, the invention must be enabled, possess a sufficient written description, and possess definiteness.

A. Enablement

A patent is enabled where the disclosure, in clear and concise terms, enables a PHOSITA to make and use the invention without undue experimentation. There is likely no place to challenge the '123 for failure to enable. The specifics of the electronics are all well PHOSITAs (as described in the fact pattern), and metal detector technology is not a field that would necessitate undue experimentation to reach a desired result.

B. Written Description

The written description requirement, different than the enablement requirement (Ariad), requires that the patent disclosure reasonably convey to a PHOSITA that the inventor was in possession of the invention at the time of filing. Given that Pat had never truly reduced the invention to practice at the time of the filing, it's possible he could face a written description challenge to validity. One typical written description challenge will suggest that the patentee has asserted her claims too broadly, and this is a possible challenge to Pat's '123 patent. Another

often raised written description challenge occurs when the patent specification has been amended, which is the case for the '123 patent. These claims are likely flimsy, and Pat could respond by arguing that metal detector technology is well known to those skilled in the art, and the claimed elements are clearly discussed in the patent specification and drawings.

C. Definiteness

A patent must also possess sufficient definiteness, such that a PHOSITA is informed with reasonable certainty as to the scope of the invention. Pat could certainly see a definiteness challenge on the basis that claim 2 (dependent on claim 1) asserts a conflicting scope to claim 1, or even that claim 1 asserts standalone indefinite claims. Claim 2 states that the electronic module should be located outside of the heel sole, but claim 1 could be interpreted as requiring the module to be in the heel sole. Prior to the prosecution amendment, this element of claim 1 read “an electronic module packaged in the heel area of the sole”, indicating this requirement. Additionally, if claim 1 is to be read construing the electronic module to have no specific location, that means that the claimed terms “said coils packaged in the heel area of the sole” and “*wire coils* for electromagnetic field generation, and field changes detection *packaged inside the frontal (toe) area of the sole* of the shoe” (emphasis added) leads to an indefinite reading of the claim. As such, there is a decently strong argument that claim 1 – and by dependency claim 2 – should be read as indefinite.

In response to this argument, Pat would have to argue that the prosecution history and FIG. 2 demonstrate that the phrase “packaged in the heel area of the sole” applies to the electronic module, not the wires/coils.

Pat may also see a definiteness challenge in the form of an assertion that some claim elements are means-plus-function elements that lack sufficient structure. However, pat will likely argue that these potential means-plus-function claims are not means-plus-function or, such as the electronic module, were either corrected during prosecution or have clear and sufficient structure defined in the specification.

4. Novelty, Anticipation, and 102 Bars

A patent may also be challenged under § 102 for lack of novelty. In assessing novelty, the patent can only be analyzed in light of the available prior art and the critical date of the filing. First, this prior art and critical date must be defined. Next, any § 102(b) exceptions should be assessed. Finally, the prior art should be analyzed to determine if any single reference adequately anticipates the invention. The critical date of the '123 patent is the filing date, May 31, 2014.

Prior art can be any of patented disclosures, printed publications, public use, or sale/offer for sale. As such, the available prior art may include: the '553 patent, Pat's kick starter, the /r/shittykickstarters thread, the French patent application, the '456 patent associated with the French patent, and the boot picture released by the French company. After the disclosures are determined to be valid prior art, the information described in each disclosure should be compared against each of the '123 patent's claims to determine if a single reference contains each and every element of a specific claim.

The '553 Patent: The '553 patent is clearly prior art as a patent awarded well before Pat's filing date under 102(a)(1). But, the '553 patent does not possess all the elements of Pat's invention, such as "shoe" element. Therefore, the '553 patent does not anticipate the '123 patent.

Pat's Kickstarter: Pat's kickstarter page would probably constitute an offer to sell the invention, and enter the realm of prior art. There is also an argument that the Kickstarter page is a printed publication. The Kickstarter project was launched on June 1, 2013, and it failed on December 31, 2013. Under § 102(b), Pat has the authority to disclose or exploit his invention within a 1 year prior to the critical date – making this period May 31, 2013-May 31, 2014. Resultantly, the Kickstarter page would be excluded from the prior art because it was attributable to Pat and disclosed within 1 year of filing.

/r/Shittykickstarters: Online databases or forums, such as Reddit, certainly would qualify as a printed publication – and maybe even “otherwise known to the public”. As the Kickstarter failed by Dec. 31, 2013, it is safe to say that these forum posts were available prior to the critical date. However, some of the information present in the forum is attributable to Pat, and therefore excluded as explained for the Kickstarter page – such as the statements about what is in the Kickstarter. Additionally, the only other information available in the thread speaks to the issue of the apparatus' thickness, and the inability to bend a battery. While this piece of art does not anticipate, due to not containing all elements, it may be relevant for an obviousness analysis.

French Boot Patent and the '456 Patent: The French patent itself would not be considered prior art, as it was not available to the public until after the filing date of the '123 patent. However, the '456 associated patent may be able to claim priority to the French patent and receive the effective filing date under § 102(a)(2). The French Boot patent was filed in France on July 1, 2013 and was awarded 18 months later. The associated boot patent '456 was filed in the US on July 1, 2014 and was awarded on June 30, 2016. As § 102(a)(2) allows patent applications to claim priority to properly filed foreign applications, the '456 patent would likely be able to claim an effective filing date of July 1, 2013 – prior to the filing date of the '123 patent, making it relevant

prior art. While it does not become prior art under § 102(a)(1), it would be prior art under § 102(a)(2). The '456 patent describes elements of coils, a control module/battery, and a buzzer/notification system, but does not speak to the electronic module being embedded with in the sole.

Boot Picture and Tringa: The boot picture was released after the filing date, and therefore is not prior art. This is the same for Flip Flop Find.

The relevant and applicable pieces of prior art are the '553 patent, the '456 patent, and the reddit thread discussion. Next, each piece of prior art should be compared to the claims to determine if each and every element is contained in a single piece of prior art. The anticipation of the Reddit thread and '553 patent are discussed above, but the '456 patent presents the strongest case for invalidity due to lack of novelty, discussed below.

Claim 1: The claim 1 elements of the '123 patent are (1) the wire coils packaged in the toe area of the sole, (2) the electronic control module, (3) the battery, and (4) the buzzer and LEDs for detection alerts. There is a slight claim construction issue as to whether this claim contains a limitation that the module must be embedded in the sole of the shoe, but seeing as claim 2 specifies it is not – this anticipation analysis will assume that it is. In response to this anticipation argument, Pat would argue that the '456 and associated French Patent disclosures do not contain all the elements of his '123 patent. One of those elements is the packaging of the electronic module in the heel area of the shoe's sole (claim 1). This is not disclosed or described in the '456 patent, and therefore it does not anticipate the '123 patent's claim 1.

Claim 2: Pat would definitely face an invalidity challenge with respect to the '456 patent anticipating the '123 patent under § 102(a)(2), as to claim 2. Claim 2 specifies that the electronic

module be located outside of the shoe's sole. And all other elements are shared between the '123 and '456 patents. Resultantly, claim 2 would likely be invalidated as being anticipated by the '456 patent under § 102(a)(2).

5. Obviousness

Obviousness under § 103 is evaluated based on the knowledge of the art at the time of filing and can be used to render a patent invalid. Pat will certainly face an obviousness challenge to his '123 patent. To evaluate the obviousness of a patent, courts have used a 5-factor system under *Graham* and *KSR*.

First, determine the scope and content of the prior art. To be analogous and relevant art, the art must be either in the same field as the invention, or still maintain a reasonably pertinent piece of art to the particularly addressed problem – all art described here is clearly analogous. Second, identify differences between the prior art and the claimed invention.

The '553 Patent: The '553 patent disclosed information teaching metal detection methods using wire coils and power controls, but does not teach any information regarding the shoe implementation.

/r/Shittykickstarters Thread: The Reddit thread disclosed information regarding the problems with Pat's proposed invention (area surveyed, ergonomics, depth of detection, and inflexible batteries), but did not teach any information regarding embedding the module in the rigid sole. It does, however, bring to mind the question of flexibility on shoes imposing difficulty for imbedding electronics, potentially begging a solution.

The '456 and French Patent: The '456/French patent discloses information containing elements of coils, a control module/battery, and a buzzer/notification system. It does not however, teach the embedding of the module within the sole of the shoe.

Third, assess the level of ordinary skill pertinent to the invention, which would be any electrical engineer avid metal detector hobbyist that possesses the relevant skill in the art to interpret disclosures regarding metal detector systems and formulations.

Fourth, determine the obviousness or non-obviousness associated with the invention. Under *KSR*, a patent which simply arranges old elements to yield predictable results is likely obvious. Additionally, a may be “obvious to try” if it is simply one of a finite number of identified particular solutions to a problem (*Kubin*). The '553 patent describes all related metal detector technology, the '456 patent discusses the shoe formulation without embedding the module in the sole, and the Reddit thread discusses the issues of flimsy soles and electronics. In sum, for claim 1 the question becomes whether the '456 and '553 patents disclose enough information to make the decision to embed the module in the sole an obvious one, while considering the context of the reddit thread which speaks to this issue.

Finally, utilize secondary considerations, (e.g. commercial success, long-felt but unsolved needs, unexpected results, disbelief by experts, failure of others, copying by others, and praise) to ensure a full assessment of the situation, assuming these considerations bear a nexus to claimed features. In Pat's case, some of these secondary considerations may be relevant. The disbelief by others demonstrated by the Reddit thread may speak to Pat's claimed invention as a non-obvious improvement over the known possibilities available for this field. One post in the thread stated “I'd build something like this out of Arduino boards and it'd fit in a smaller disclosure” while another stated “those PCBs and flat lithium batteries don't take well to being

bent”. Indicating the sentiment that implementing this claim 1 feature of the ‘123 patent would be difficult or hard or believe.

In an overall assessment of obviousness, I think it is *fairly unlikely* that claim 1 of the ‘123 patent will be invalidated for obviousness, while claim 2 likely would if it was not already invalidated for novelty as described previously. The embedding of the module into the sole was a formulation for which the prior art expressed doubt and did not teach, indicating that the element comprises a non-obvious improvement.

Q2: Infringement

Under § 271, anyone who makes, uses, offers to sell, or sells a patented invention without authorization infringes the patent. Pat will likely bring a claim of literal infringement against Trina, as well as an infringement suit utilizing the doctrine of equivalents.

First, the claims of the original patent will be construed by the court (*Markman*). Under *Phillips*, the claim language provides the starting point, then the remaining specification is utilized for context, and finally extrinsic evidence may be used if needed.

1. Claim 1

The claim 1 elements of the '123 patent are (1) the wire coils packaged in the toe area of the sole, (2) the electronic control module, (3) the battery, and (4) the buzzer and LEDs for detection alerts. Trina's Device includes elements of coils in the front sole of the shoe, lights for notification when metal is detected, and a module and battery strapped to the user's leg. Pat will likely assert that Trina's device possesses all the elements of his device. However, in response you can make the argument that one of the crucial elements of the '123 patent is packaging the electronic module within the sole of the shoe. Trina's device does not possess this this element, and she should win on the issue of literal infringement. This will likely become an issue of claim construction.

During claim construction, Pat will likely argue that the claim element of an electronic module does not possess the limitation of being located in the heel of the sole, evidenced by the literal claims, the specification, and the separation of claims 1 and 2.

He may assert that the phrase "packaged in the heel area of the sole" applies to the coils, which in the published patent directly precedes this phrase ("said coils packaged in the heel area

of the sole”). Additionally, Pat may argue that the location of the electronic module was described as being movable in the specification: “while electronics can be placed inside the shoe or packaged in an outside pouch” (‘123 specification). Lastly, Pat will assert that this claim should be construed in a manner defining the module as not tied to a location because claim 2 retains all elements of claim 1, and asserts a clear location for the electronic module. Essentially, why would claim 2 be allowable if it asserts two different locations for the module? Resultantly, Pat will argue claim 1 must be construed as if the “electronic module” does not have a claimed location.

This argument can be countered by looking to the prosecution history of the ‘123 patent, wherein the phrase “for controlling power to said coils and receiving signals from said coils” was amended in, indicating that the module is clearly intended to be claimed as located within the heel of the sole. Additionally, FIG. 2 of the ‘123 patent depicts the module located in the heel of the shoe, and Pat has never offered an additional location for the module. Pat is unlikely to win on this claim construction argument.

Pat may also argue that the doctrine of equivalents (DOE) applies to this situation, arguing that the location of the electronic module on the leg is equivalent to the module located in the heel – therefore infringing. In analyzing whether the DOE applies, the allegedly infringing device must perform the (1) substantially the same function, in (2) substantially the same way, to (3) obtain substantially the same result. Pat will likely argue that the location of the electronic module does not change the function or results of the device at all, which he would be mostly correct about. He will also argue, as to element (2) of the DOE, that it accomplishes this goal in substantially the same way. While the module in Trina’s device does perform a similar function

to that of Pat's, the distinction between location in the '123 patent's claim 1 and claim 2 alone are likely enough to show that this is not a case of equivalency.

2. Claim 2

Claim 2 of the '123 patent retains all elements of claim 1 but specifies the location of the electronic module as outside of the shoe's sole. On this claim, Trina will have a much more difficult time arguing for non-infringement. Her device clearly possesses the elements of the '123 patent claim 2. As such, the best path would be to argue invalidity of claim 2, with regard to indefiniteness because two separate locations are claimed. See Q1 for further discussion of indefiniteness and invalidity.

Q3: The 1952 Act

For novelty, the critical date would not be the filing date, rather it is the date of invention (§ 102(a)). Pat would likely argue that the date of invention for his '123 patent is the date is as early as possible – the date of conception, 1/1/2013. But it could be argued that the invention was the date he created the rough prototype and Kickstarter, 6/1/2013.

Regardless of the specifics of the invention date, the '456 patent could be argued to be non-applicable prior art, as the patent was published in France on 1/1/2014, and filed in the US on 6/1/2014 (after the critical date). There would likely be a dispute regarding the invention date corresponding to the '456 patent's invention date.

Pre-AIA § 102(g)(1) interference may also be relevant because there will be a debate as to whether Pat or the French company was first to invent. If Pat was the first to conceive of the idea, but the French company was the first to reduce to practice, Pat can still win here by showing diligence between the period of conception and reduction to practice. Pat may struggle with this, as even the Kickstarter prototype is not a true experimental prototype.

Additionally, the anticipation analysis is the same under the '52 Act, and the Reddit thread and '553 patent would remain viable prior art regardless.

Obviousness under the 1952 Act is measured at the time of invention (as opposed to the date of filing), but this wouldn't change anything. Additionally, post-AIA best-mode can no longer invalidate a patent, so that would be a factor that must be considered in the Q1 analysis.