

Sample Exam Answer

LAW-688-001 Patent Law

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Note: This exam answer addresses every significant issue that I observed while reviewing exam papers. This includes issues that are irrelevant, in order to explain their irrelevance. As a result, this answer is much longer and covers much more than what I would have expected anyone to write. Footnotes are commentary on the sample answer, and not intended as part of the answer

1 Question 1

1.1 Subject Matter Eligibility

Alice's application may be unpatentable for lack of subject matter eligibility under § 101. Per the *Alice/Mayo* test, a patent claim lacks eligibility if (1) it is directed to an ineligible concept, namely an abstract idea, law of nature, or natural phenomenon; and (2) there is no inventive concept or "significantly more" to the claim that transforms it to be eligible.

Here, Alice's claim is directed to a law of nature, namely the discovery that dark matter stabilizes a quantum superposition. Thus, step 1 of the test is satisfied. Regarding step 2, Alice may argue that the enclosed chamber and/or the quantum computing circuit contribute the inventive concept to render the claim eligible. Indeed, neither on its face would seem to preempt the general law of nature involved, since dark matter could be used in contexts other than vacuum chambers or quantum computing circuits. However, there are strong arguments to the contrary. A enclosed chamber, being used to enclose something, would seem like "well-understood, routine, conventional activity" that *Mayo* rejects as an inventive concept. And given that designs for quantum computers are well-known, one could argue that the inclusion of a quantum computing circuit in

the claim is analogous to a general-purpose computer recited at a high level of generality, which *Alice* holds to be insufficient for step 2. Given the importance of continuing research in the field of quantum computing and the broad reach of *Alice*'s patent, it seems likely (though far from certain) that the patent claim is invalid for ineligibility.

1.2 Enablement

Alice's claim may also be unpatentable for lack of enablement under § 112. A patent claim is not enabled if a person of ordinary skill in the art could not make and use the claimed invention without undue experimentation, typically determined based on the factors given in *In re Wands*.

Here, at the time that *Alice* filed her application, there was no known way of making or otherwise collecting dark matter, a necessary step to making and using the claimed invention. *Alice* might argue that it took her only six months working with *Bob* to produce it, and given that the level of ordinary skill in the art is high, that amount of experimentation is reasonable and not undue. However, if *Alice* is indeed a "modern-day Albert Einstein," perhaps her rapid success is not necessarily indicative of the ordinary amount of experimentation required; in any event *Alice*'s specification certainly gives no guidance on how to make dark matter, and the field is likely unpredictable given that dark matter is near impossible to identify or observe. Many of the *Wands* factors thus seem to lean in the direction of experimentation being undue, suggesting that the claim is invalid for lack of enablement.

1.3 Written Description

Alice's claim may also be unpatentable for lack of written description. Distinct from enablement, the written description of § 112 requires, per *Ariad v. Eli Lilly*, that the patent specification "clearly allow persons of ordinary skill in the art to recognize that the inventor invented what is claimed"; that is, that the inventor had possession of the invention. The possession standard can fail to be met, for example, with patent claims that "merely recite a description of the problem to be solved while claiming all solutions to it."

Here, the examiner could argue that dark matter as of the time of *Alice*'s application is merely theoretical because the possible candidates for dark matter are hypothetical. Indeed, the facts are reasonably analogous to those in *Ariad*, insofar as *Alice* has discovered a "pathway" for stabilizing superpositions but has

not actually invented the materials necessary to take advantage of that pathway. On the other hand, Alice could contend that her examples, though theoretical, do convey a complete understanding of the invention indicating possession of that invention. The application does indeed identify three prophetic examples of potential dark matter, thereby disclosing “a representative number of species falling within the scope of the genus” of dark matter claimed.

On balance, it seems at least plausible that the claim satisfies the written description requirement, and holding in that direction would properly reward the discoverer of important new technologies like Alice’s. That said, the potential effects on downstream innovation could easily weigh in the other direction, akin to *Ariad*.

1.4 Utility

Alice’s application likely satisfies the requirement of substantial utility, because quantum computing is a specific, real-world use of the claimed dark matter chamber. Credible utility is presumably also satisfied given that Alice was able to produce dark matter. (Plausibly, though, a patent examiner would be justified in asking Alice to demonstrate credible utility during patent prosecution.)

1.5 Indefiniteness

Alice’s claim is likely definite. A claim only needs to be reasonably certain to satisfy the § 112(b) definiteness standard. The most likely indefinite element of the claim is the quantity of dark matter, but assuming that Alice’s calculations (given in the specification) provide information on the necessary quantity, then definiteness is likely satisfied.

1.6 Novelty and Obviousness

There is likely no issue of novelty for Alice’s patent, because there is no prior art reference disclosing the use of dark matter to prevent decoherence as required by element [c] of the claim. (The *Journal of Astrophysics* probably didn’t say anything about quantum superposition decoherence—if it did, then presumably Alice wouldn’t have had to run to her office and do lots of complex math to prove it.)

Similarly, there is likely no issue of obviousness. Even though the theoretical properties of dark matter were known (e.g., from the article Alice read) and the

general design of a quantum computer was known, nothing taught or suggested the combination of the two ideas, and the dark matter's superposition-stabilizing capability appears to be an unexpected result insofar as it took Alice, apparently a pretty smart scientist, 30 pages of calculus to determine that the two ought to be combined. This suggests that the combination of dark matter and quantum computing would likely not have been obvious to a person of ordinary skill in the art, especially in view of the long-felt need for stable superpositions that has gone unfulfilled despite substantial research on dark matter.

2 Question 2

In order to be liable for contributory infringement, a defendant must satisfy the knowledge requirements, there must be a direct infringer, and the other relevant statutory requirements of § 271 must be met.¹

2.1 Knowledge

Per *Commil* and *Aro II*, the knowledge requirement for indirect infringement is twofold: knowledge of the patent and knowledge that one's acts infringe the patent. Knowledge of the patent is satisfied because Eve has read Alice's patent. Given that Eve intends to sell enclosed chambers that appear modeled after Alice's and are based on Alice's calculations, it seems difficult for Eve to argue that she has no knowledge of infringement. Eve could obtain an opinion letter from counsel showing that her chamber does not infringe (e.g., for the reasons below), to protect herself from indirect liability.

2.2 Direct Infringer, Doctrine of Equivalents

The potential direct infringers in this case are Eve's customers who assemble Eve's chambers into quantum computers. For them to be direct infringers, they must infringe literally or by the doctrine of equivalents. Literal infringement is

¹As an exam-organizing note: Sometimes it's easier to analyze some big-ticket subissues first, like knowledge and the doctrine of equivalents, and then use those subissue analyses later when going through the main elements. That's what's done here. You could also have laid out the 271(c) elements first, and then marched through its elements, dealing with each subissue as you reached it. Either way is fine.

not possible, however, because Alice's claim requires a chamber filled with dark matter, and Eve's is filled with helium superfluid.

Thus, infringement is only possible via the doctrine of equivalents, namely if helium superfluid is equivalent to dark matter. Equivalency is typically determined by the function-way-result triple identity test. That test is likely met here: Helium superfluid functions to stabilize superpositions, it appears to do so in the same way given that Alice's calculations on dark matter apply to the helium superfluid as well, and the resulting stable superposition is the same. Accordingly, a court would likely find Eve's buyers to be direct infringers under the doctrine of equivalents. Eve could potentially research the way in which helium superfluid works, to possibly discover differences between it and dark matter, which may affect the triple-identity analysis.

2.3 Contributory Infringement

For Eve to contributorily infringe, she must (1) sell or offer to sell a component of a patented invention, where (2) that component is a material part of the invention, and the seller (3) knows the component to be (4) specially made or adapted for infringement and without substantial noninfringing uses. (1) Eve wants to sell superfluid chambers which are a component of Alice's patented invention, and (2) they are a material part of the invention insofar as there is direct infringement based on them and the superposition-stabilizing chamber is at the core of Alice's invention. (3) Eve meets the knowledge requirement for reasons given above. (4) The chambers also are specially made for infringement and without substantial noninfringing uses because, as of right now, Eve knows of no other uses for the chamber. Eve could potentially research other uses of the chambers, thereby identifying substantial noninfringing uses for them, to further protect herself from liability for contributory infringement. Otherwise, however, it is likely that she would be liable.