American University Washington College of Law
Fall 2024 Final Examination
LAW-688-001 Patent Law

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Instruction Page

1. The length of the examination: 3 hours

2. This exam consists of 4 pages including the instruction sheet(s). Please be sure your exam is complete.

3. This exam is open book. Students are permitted to access materials stored on their computer hard drives, but are not permitted to access the internet.

4. Multiple Choice:

   - You must respond using the multiple-choice feature of Exam4's software.
   - Only use Scantron paper if your laptop stops working.

5. Additional instructions: See the next page.

WCL Exam Policies

1. You must use your Fall 2024 Exam Number / Anonymous Grading Number (AGN). Write it on the blue book, exam questions, and any scrap paper. **Do not use your name, student ID number, or social security number**. Use the guide posted via the following link to find your Exam Number/Anonymous Grading Number (AGN) for the current term: (https://shorturl.at/rZMdQ).

   Do not contact your professor about the exam until after grades have been released.

2. No corrections will be made once the exam is distributed. If there is a typo or ambiguity in a question, state your assumption and answer accordingly. **Please note: Proctors are not allowed to answer questions about the examination.**

3. All materials, including the **questions, handwritten answers (if applicable), and scratch materials**, must be placed inside the exam envelope and returned to the proctor at the end of the exam.

4. Students are permitted to use one electronic device (laptop or compatible tablet). The use of additional electronic devices (cell phones, mp3 players, smart watches, tablets, etc.) is prohibited during the exam.

5. You are reminded that the WCL Honor Code applies to this examination.

General Instructions

The following instructions apply to all questions below.

Patents. Unless the stated facts require otherwise, "patent" means a United States utility patent, and the filing date of a patent application is the effective filing date of the application. References to a patent being "held valid" should be interpreted as the patent being "held not invalid."

Jurisdiction. Unless otherwise stated, all people and activities are in the United States.

Technical Facts. You must accept as true any technical fact stated in this exam, even if it appears untrue in reality. (This is necessary because I cannot invent truly new technologies for the exam.) Basic background facts such as laws of physics may of course be used even if they are not directly recited, as long as they do not contradict the facts given in the question.

Claim Construction. Analyze the construction of a patent claim term only if the outcome of another legal issue depends on the claim construction, and if there is a likely substantial dispute over the term. In your analysis, identify how both sides would want the claim construed, the best arguments in favor of each side's construction, and the impact of each construction on the other legal issue.

Word and Time Limits. The times given for each problem are just suggestions; you may allocate time on this exam as you wish. The word limits are mandatory. They are also very generous, and an excellent answer would contain far fewer words. In Exam4, remember to click "Show Document Statistics" and "Insert Answer Separator" so that you can see word counts for individual questions.

Address All Issues. Even if you think a particular issue is dispositive, **do not stop your analysis**. For example, even if you think a patent is invalid, you should continue to consider whether it is infringed.

Answer Quality. Credit on this exam will be given for clarity, organization, and conciseness in writing. You are highly encouraged to use font styles and paragraph breaks to make your answers as clear and readable as possible.

Facts (15 min to read)

Background

Quantum computing is the future. It is exponentially faster than traditional computers and capable of solving problems, like breaking Internet encryption, that are intractable by today's standards. Research has been ongoing since at least the 1980s, theoretical designs for quantum computers are well-known, and experimental breakthroughs regularly make headlines.

Unfortunately, all quantum computer designs rely on maintaining particles in a delicate "superposition" state. Even tiny vibrations or disturbances will cause the particles to "decohere" and no longer be in a superposition. Avoiding decoherence has been a central research question that, if solved, would allow any number of existing quantum computer designs to become reality.

Separate from quantum computing is a paradox of the universe: so-called "dark matter." Calculations based on observational data of the cosmos predict that the universe must contain far more matter than is measured in stars, galaxies, and other astronomical bodies. But this missing matter does not interact with light (hence the name "dark matter"), making it difficult to identify or observe. Physicists have hypothesized multiple theoretical particles, including "sterile neutrinos," "axions," and "primordial black holes" (PBHs), one or more of which may be what dark matter is made of.[1]

The Invention

Alice is a professor of theoretical physics. A modern-day Albert Einstein, Alice's work is to manipulate equations to discern new possibilities for how the physical world works.

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[1] *Editorial note: The above description is a somewhat accurate description of current science. Everything below is pure science fiction.*

On Saturday, February 10, 2035, Alice is relaxing by reading the *Journal of Astrophysics*, where she encounters a new research study on the theoretical behavior of dark matter. As she reads, an insight strikes her: The predicted behavior of dark matter might be able to stabilize a superposition. Alice rushes to her office. Thirty pages of calculus later, Alice is convinced that, at least in theory, enough dark matter can prevent decoherence of a superposition.

Alice might be a theoretician, but she is practical enough to realize the tremendous commercial value of her discovery—her findings lay the foundation for a quantum computer. The very next Monday, February 12, 2035, Alice files a patent application.

The Patent Application

The application lays out a full and complete description of superpositions and their application to quantum computing. It also provides a complete description of the current theory of dark matter, including the hypotheses on sterile neutrinos, axions, and PBHs as potential candidates for dark matter. The application defines dark matter as "any matter that does not interact with light." It presents Alice's calculations on how dark matter prevents decoherence of superpositions, and proposes the use of any of sterile neutrinos, axions, and PBHs for this purpose. The application concludes with the following claim:

An apparatus comprising:
    [a] an enclosed chamber;
    [b] a plurality of particles within the enclosed chamber, each of the plurality of particles being in a superposition;
    [c] a quantity of dark matter within the enclosed chamber, sufficient to prevent decoherence of the plurality of particles; and
    [d] a quantum computing circuit in communication with the plurality of particles.

There is, of course, a problem. No one has collected or produced any dark matter. For the next six months, Alice collaborates with an experimental physicist, Bob. By August 20, 2035, the two successfully create PBHs, one type of dark matter.

The Competition

Eve is a physics researcher at a commercial research laboratory, studying the properties of helium superfluid. On August 17, 2037, Eve reads Alice's February 12, 2035 patent application, and realizes from Alice's calculations that a helium superfluid would prevent decoherence of a superposition in the same way that dark matter would. Helium superfluid is regular matter that does interact with light, so it is far easier to work with than dark matter.

Based on this discovery, Eve would like to manufacture and sell enclosed chambers containing several particles in a superposition state, along with enough helium superfluid to prevent decoherence. Eve does not know how to install quantum computing circuits into the chamber, but expects that her customers will be able to add them without difficulty. The customers might use the chambers for some other purpose, of course, but Eve doesn't know of any other uses for them yet. And why wouldn't they use them for quantum computing? After all, it's the future.

Perhaps it's the future, but U.S. patent law has remained unchanged since 2024.

Question 1

(1700 words, 45 minutes)

You are the examiner assigned to Alice's February 12, 2035 patent application. You have all the facts above stated. Your search for prior art has turned up nothing additional of relevance. Identify and analyze each possible grounds for rejection of the application for unpatentability.

Question 2

(1000 words, 30 minutes)

Assume that Alice's February 12, 2035 patent application is granted without amendments and valid as of August 17, 2037. Analyze Eve's potential **liability for contributory infringement only** to Alice based on this patent. If there are steps that Eve can take to reduce the likelihood of her liability, recommend them.

Do not consider remedies or inducement liability. Answer this question using the standard IRAC format, inserting recommendations into the analysis as appropriate.

Multiple Choice (90 minutes)

[This section omitted]