I have uploaded an invention disclosure form ( hereinafter, "IDF"). Now I want you to act as my virtual Patent Attorney and help me in drafting a patent application for this invention.

Feel free to add and modify whatever information you find necessary to enable this invention and make it patentable as per USPTO and EP laws. There may be certain things which I have not mentioned because those are generic technological details that may be available as public knowledge. I want you to add such generic technological details to the invention disclosure wherever needed.

Specifically, I want you to add as much embodiments as possible to be added to this invention so as to make it novel and non-obvious to a person of ordinary skill I the relevant art.

At this stage, I want below things from you in a word file

1. A suitable title as per USPTO and EP patent laws

2. Technological Field of the invention as disclosed in the attached IDF

3. Brief background as per the information in the attached IDF. If the attached IDF does not include the background of the related technology then please do a web search and write very short summary of the background or the conventional technology with its associated disadvantages and problems. Please strictly do not include any detail about the invention or solution to the problem in the background section.

4. Now I need a set of claims as per USPTO laws. Specifically, I want one independent system/apparatus/device claim and few dependent claims. I want to generate a well-structured independent claim and a set of dependent claims for a patent application based on the details provided in an IDF. The independent claim should broadly define the invention without unnecessary limitations, by giving maximum protection. The dependent claims should progressively narrow the scope by adding specific features, variations, and implementation details.

Note: Please capture the novelty from the IDF in the independent claim 1 and make a broader independent claim 1.

An independent claim must define the invention's category (device, system, method, or composition) and include its essential components or steps, detailing their functional relationships and interactions to achieve the intended purpose. It should also emphasize the invention's novelty, technical advantages, improvements over prior solutions, and the specific problem it addresses.

Dependent claims should introduce refinements—structural, mechanical, or functional—to enhance performance, including alternative implementations like materials, different sensors, cameras, actuators, motors, machine learning or AI algorithms or chemical compositions while preserving core functionality. They should also define interactions with external systems for seamless integration and specify conditions, thresholds, or operational modes to improve adaptability and precision in real-world applications.

Optimizing patent quality by providing clear notice to the public of the boundaries of the inventive subject matter protected by a patent grant fosters innovation and competitiveness. Accordingly, providing high quality patents is one of the agency’s guiding principles. The Office recognizes that issuing patents with clear and definite claim language is a key component to enhancing the quality of patents and raising confidence in the patent process.

Please take care of the following given below instructions while designing claims.

i) 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph requires that a patent application specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention. (Note that although pre-AIA 35 U.S.C. 112, second paragraph, uses the phrase “which applicant regards as his invention,” preAIA 37 CFR 1.41(a) provides that a patent is applied for in the name or names of the actual inventor or inventors.) In patent examining parlance, the claim language must be “definite” to comply with35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph. Conversely, a claim that does not comply with this requirement of 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph is “indefinite.”

ii) The primary purpose of this requirement of definiteness of claim language is to ensure that the scope of the claims is clear so the public is informed of the boundaries of what constitutes infringement of the patent. A secondary purpose is to provide a clear measure of what the inventor or a joint inventor regards as the invention so that it can be determined whether the claimed invention meets all the criteria for patentability and whether the specification meets the criteria of 35 U.S.C. 112(a) or pre-AIA 35 U.S.C. 112, first paragraph with respect to the claimed invention.

iii) It is of utmost importance that patents issue with definite claims that clearly and precisely inform persons skilled in the art of the boundaries of protected subject matter. Therefore, claims that do not meet this standard must be rejected under 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph as indefinite. Such a rejection requires that the applicant respond by explaining why the language is definite or by amending the claim, thus making the record clear regarding the claim boundaries prior to issuance. As an indefiniteness rejection requires the applicant to respond by explaining why the language is definite or by amending the claim, such rejections must clearly identify the language that causes the claim to be indefinite and thoroughly explain the reasoning for the rejection

iv) A claim is indefinite when it contains words or phrases whose meaning is unclear. In re Packard, 751 F.3d 1307, 1314, 110 USPQ2d 1785, 1789 (Fed. Cir. 2014). The lack of clarity could arise where a claim refers to “said lever” or “the lever,” where the claim contains no earlier recitation or limitation of a lever and where it would be unclear as to what element the limitation was making reference. Similarly, if two different levers are recited earlier in the claim, the recitation of “said lever” in the same or subsequent claim would be unclear where it is uncertain which of the two levers was intended. A claim which refers to “said aluminum lever,” but recites only “a lever” earlier in the claim, is indefinite because it is uncertain as to the lever to which reference is made. Obviously, however, the failure to provide explicit antecedent basis for terms does not always render a claim indefinite. If the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite. Ex parte Porter, 25 USPQ2d 1144, 1145 (Bd. Pat. App. & Inter. 1992) (“controlled stream of fluid” provided reasonable antecedent basis for “the controlled fluid”). Inherent components of elements recited have antecedent basis in the recitation of the elements themselves. For example, the limitation “the outer surface of said sphere” would not require an antecedent recitation that the sphere has an outer surface. See Bose Corp. v. JBL, Inc., 274 F.3d 1354, 1359, 61 USPQ2d 1216, 1218-19 (Fed. Cir 2001) (holding that recitation of “an ellipse” provided antecedent basis for “an ellipse having a major diameter” because “[t]here can be no dispute that mathematically an inherent characteristic of an ellipse is a major diameter”).

v) Antecedent problems in the claims are typically drafting oversights that are easily corrected once they are brought to the attention of applicant. The examiner’s task of making sure the claim language complies with the requirements of the statute should be carried out in a positive and constructive way, so that minor problems can be identified and easily corrected, and so that the major effort is expended on more substantive issues. However, even though indefiniteness in claim language is of semantic origin, it is not rendered unobjectionable simply because it could have been corrected. In re Hammack, 427 F.2d 1384, 1388 n.5, 166 USPQ 209, 213 n.5 (CCPA 1970).

vi) The mere fact that a term or phrase used in the claim has no antecedent basis in the specification disclosure does not mean, necessarily, that the term or phrase is indefinite. There is no requirement that the words in the claim must match those used in the specification disclosure. Applicants are given a great deal of latitude in how they choose to define their invention so long as the terms and phrases used define the invention with a reasonable degree of clarity and precision.

vii) The mere fact that the body of a claim recites additional elements which do not appear in the claim’s preamble does not render the claim indefinite under 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph. See In re Larsen, 10 Fed. App’x 890 (Fed. Cir. 2001) (The preamble of the Larsen claim recited only a hanger and a loop but the body of the claim positively recited a linear member. The examiner rejected the claim under 35 U.S.C. 112, second paragraph, because the omission from the claim’s preamble of a critical element (i.e., a linear member) renders that claim indefinite. The court reversed the examiner’s rejection and stated that the totality of all the limitations of the claim and their interaction with each other must be considered to ascertain the inventor’s contribution to the art. Upon review of the claim in its entirety, the court concluded that the claim at issue apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, paragraph 2.).