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**General Schedule
Position Classification Standards**



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**POSITION CLASSIFICATION
STANDARD
FOR
PATENT EXAMINING
SERIES,
GS-1224**



**Workforce Compensation
and Performance Service**



Patent Examining

GS-1224

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SERIES DEFINITION

This series includes all classes of positions the duties of which are to advise on, administer, supervise, or perform professional, scientific, technological, and legal work involved in the examination and disposition of applications for patents, exclusive of design patents, to determine the grant or denial of patents based on such applications, and in the adjudication of petitions and appeals from decisions on such applications. Such work in its various aspects involves the utilization of the basic and advanced concepts of the natural sciences, the techniques of all branches of engineering and of the industrial arts, and the application of those aspects of procedural and substantive law generally, and of the statutory and case law applied to patents specifically, which are applicable to the patent examining process.

SERIES COVERAGE AND TITLE STRUCTURE

This standard supersedes and is to be substituted for the standard for the Patent Examining Series which was issued in September, 1955. Positions in this series are located organizationally in the U.S. Patent Office.

Titles for positions in this series are established by designating the appropriate specialization in parentheses after the basic title; for example, Patent Examiner (Electrical Engineering).

The guides described herein are for the classification of positions in this series which are nonsupervisory in nature.

Although supervisory classes of positions are not treated in this standard, supervisory positions are identified by the addition of the term "supervisory" at the beginning of the title; for example, "Supervisory Patent Examiner (Electronics)."

EXCLUSIONS

1. Positions located in the United States Patent Office the duties of which are to advise on, administer, supervise, or perform professional, scientific, technical, and legal work involved in the examination and disposition of applications for design patents. Such positions are included in the [Design Patent Examining Series, GS-1226](#).

2. Positions located in agencies of the Government other than the U. S. Patent Office the duties of which are to supervise or perform professional and scientific work related to patents, including the analysis of inventions and the preparation and prosecution of applications for patents before the United States Patent Office, and the prosecution of appeals in the Patent Office. Such positions are in the [Patent Adviser Series, GS-1221](#).

3. Positions located in the United States Patent Office the duties of which are to advise on, administer, supervise or perform professional work involved in the development and administration of a system of classification of the industrial arts. Such positions are included in the [Patent Classifying Series, GS-1223](#).

DEFINITIONS OF TERMINOLOGY

For the purposes of this standard the following terms, most of which are peculiar to the patent profession, have the meanings given below:

Application. -- A complete application for a patent consists of: (1) a petition addressed to the Commissioner of Patents requesting the granting of a patent; (2) a specification containing a detailed written description of the invention and how it is made and how used; (3) an oath stating that the inventor believes himself to be the original and first inventor, and whether he is sole or joint inventor; (4) a drawing showing every feature of the invention, if it can be illustrated; and (5) the statutory fee.

Claim. -- A formal statement particularly pointing out and distinctly defining the subject matter which the applicant regards as his invention, including a detailed description of all essential features necessary to distinguish the claimed invention from what is old in the prior art. Novelty, patentability and infringement are judged on the basis of the scope of the claim.

Interference. -- A proceeding instituted by the Patent Office for the purpose of resolving a question of priority of invention between two or more parties claiming substantially the same patentable invention. Such proceedings may involve a plurality of applications, or applications and patents.

Patent. -- A contract by which the Government secures to the patentee the right to exclude others from making, using, or selling his invention for a statutory term of seventeen years, in consideration of the fact that he has perfected, described and granted its use to the public after the statutory duration of his monopoly.

Prior art. -- The sum of all public knowledge and developments pertaining to the subject matter embraced in a field of technology of given scope, manifested chiefly in the form of patents and printed publications.

Reference. -- A specific item of prior art which is considered in judging the patentability of a subsequent invention.

Reissue application. -- An application for a patent which is to be substituted for an unexpired patent (which, through error and without any deceptive intention, is deemed wholly or partly inoperative or invalid by reason of its being defective in some one or more particulars).

SPECIALIZATIONS

Personnel are selected and placed in specializations in this series according to their knowledge of the scientific concepts of a particular field of science and technology. The specializations recognized in this standard are described below. Each position will have the appropriate specialization expressed after the basic title, such as "Patent Examiner (Physics)" or "Patent Examiner (Electronics)".

Aeronautical Engineering. -- Typical subject matter areas included astronautics, applied aerodynamics, vibration and fluttered, aircraft equipment (including propellers and power plants installations), and aircraft (both heavier and lighter-than-air), such as airplanes, airships, rotary-wing aircraft, pilotless aircraft, and guided missiles.

Agricultural Engineering. -- Typical applications involve processes and apparatus for tillage, seeding, fertilizing, cultivating, spraying, harvesting, irrigation, livestock care and production, market and storage preparation equipment, and by-product utilization.

Applied Physical Science. -- This specialization includes: (a) positions requiring, not an intensive knowledge in a specialized technical or scientific field, but rather a broad appreciation of, and ability to apply, a wide variety of scientific and engineering concepts to a diverse range of functions (typical applications are in the industrial manufacturing arts); and (b) positions requiring a specialized knowledge of the principles and practices in any field of invention not identifiable with any other specialization of this series.

Ceramic Engineering. -- Typical applications involve methods, materials, and apparatus used in the design, testing, development, and manufacture of clay products, pottery, enamels for metals, and other ceramic materials.

Chemical Engineering. -- This specialization requires a specialized knowledge of the principles, practices, theories, and phenomena of all phases of engineering and chemistry concerned with the design, erection, and operation of chemical plants and laboratories, and the apparatus and processes employed therein.

Civil Engineering. -- This specialization requires a specialized knowledge of principles, practices, and theories of one or more of the following branches of Civil Engineering: (1) the conservation, development, control, and treatment of water; (2) structural design, lay-out, construction, or maintenance of structures, including highways and airports, dams and locks, buildings, docks and piers, and underground shelters; (3) facilities for sewerage and sewage treatment and disposal; (4) properties and economic utilization of construction materials; and (5) soil mechanics as related to foundations, earth dams, stability of slopes and other earth work problems.

Electrical Engineering. -- Typical applications involve means of generating, transmitting, distributing, regulating, converting, and utilizing electricity (direct or alternating) for such purposes as power, heating and welding, illumination, signaling, communications, testing, and closely related objectives. (In this specialization the science of electronics, while involved, is not the dominant factor.)

Electronics. -- This specialization requires a specialized knowledge of the principles, practices, theories, and laws of the science of electronics. Typical of the fields covered are: transmission and detection of information (e.g., radio and television); solid-state devices; computation, detection and measurement; oscillators, modulators, wave guides; and various related means involving radiant energy application.

Engineering Physics. -- This specialization requires not only a knowledge of basic physics, such as mechanics and properties of matter, heat, and thermodynamics, acoustics, electricity, and magnetism, optics, and spectroscopy, X-rays and radioactivity, electronics and applied geophysics, but also a more specialized knowledge of the related fields of mathematics, chemistry, and engineering.

Food Technology. -- Typical applications involve processes and means for the mass preparation, preservation, and canning of foods primarily for human consumption.

General Chemistry. -- This specialization requires a specialized knowledge of the principles, practices, theories, and phenomena of all chemistry other than organic. Typical applications involve inorganic chemistry, analytical chemistry and analytical control methods, electrochemistry, biological chemistry, physical chemistry, extraction of minerals from their ores, purification of gases, processes, and apparatus. (In this specialization the science of organic chemistry, while involved, is not the dominant factor.)

General Engineering. -- This specialization includes all positions which (a) require a specialized knowledge of the principles, practices, and theories of general engineering, or which (b) involve work identifiable with two or more of the specializations of this series, at least one of which is an engineering specialization. Typical applications involve such engineering fundamentals as the strength and strain analysis of engineering material and structures; the physical and chemical characteristics of engineering materials, such as elastic limit, maximum unit stresses, coefficients of expansion, workability, hardness, tendency to fatigue, resistance to corrosion, and engineering adaptability; and the engineering means of construction and processing.

Geological Engineering. -- Typical applications involve processes and means for determining the constituents, composition, textures, structures, and classifications of rocks, minerals, and fossils; the processes and means for constructing stable structures in water or shifting earth; or processes and means for subsurface storage of fluids in natural chambers.

Horticulture. -- This specialization requires a specialized knowledge of the principles, practices and theories of horticulture and basic plant science. Typical applications involve plant hybrids.

Industrial Engineering. -- Typical applications involve all phases of engineering concerned with such things as plant lay-out, plant facilities, production methods, products manufactured and flow of materials, to improve the efficiency of production, products, or man-machine systems.

Marine Technology. -- This specialization includes both engineering and other areas of technology requiring specialized knowledge of the principles, practices, and theories applied in the development of apparatus or means for the propulsion of floating vessels, hull construction, supplying power for shipboard services, and navigation control and communication through electrical or other systems. Typical applications involve steam and other types of marine combustion power-plant systems, hull design and construction, propellor shafts and bearings, fresh water supply systems, refrigerating systems, gyroscopic compasses, sounding apparatus, telephonic and telegraphic communications, radio and radar, and other marine systems and equipment.

Mechanical Engineering. -- Typical applications involve processes and means for the design, construction, procurement, installation, operation, maintenance, testing, or inspection of

mechanical apparatus and equipment, such as steam boilers; engines, turbines; pumps; condensers; internal-combustion engines (diesel and gas); hydraulic power apparatus; machine tools and other industrial machines; heating, ventilating, and air-conditioning systems and equipment; refrigeration machinery; and construction machinery.

Metallurgical Engineering. -- This specialization requires a specialized knowledge of the principles applied in the development of apparatus or processes used in the application of metallurgy and related engineering principles to problems involved in the extraction of metals from their ores and refining them; to the compounding and alloying, and to the mineral dressing, treating, working, and shredding of metal, including smelting, amalgamation, electrolytic-refining, and heat-treating.

Mining Engineering. -- Typical applications involve processes, and apparatus for the discovery and efficient extraction of solid fuels, metalliferous ores, and nonmetallic minerals.

Nuclear Engineering.-- This specialization requires a specialized knowledge of nuclear radiation measurements, nuclear reactor characteristics , neutron and gamma transport and heat transfer and fluid mechanics.

Organic Chemistry. -- Typical applications involve new organic compounds, including resins, synthetic and natural rubber, proteins, carbohydrates, cyclic and acyclic carbon compounds, dyes, medicines, insecticides and processes for making them.

Petroleum Engineering. -- Typical applications involve processes and apparatus used in the exploration and recovery of petroleum resources, in testing petroleum and petroleum-bearing rocks, in estimating mineral resources, installing field equipment, and in servicing oil wells.

Physics. -- This specialization requires a specialized knowledge of the principles, practices, theories, and laws of the science of physics, which include mechanics, sound, optics, magnetism, radiation, or atomic and nuclear phenomena.

Textile Technology. -- This includes both engineering and other technological areas involving such applications as: processes and apparatus for spinning, weaving, knitting, finishing, and chemical treating; for manufacturing processing, treating, testing, modifying, and repairing textiles and textile products; and for determining, testing, and modifying the physical characteristics and properties of textiles or textile items.

The foregoing discussion of areas of technological specialization is not intended to suggest that an examiner working in one specialization is not guided by virtually the same examining methods, techniques, guides used by other patent examiners in other specializations. On the

contrary, it is generally recognized that all patent examiners have acquired a certain background which they share in common. Specialization, therefore, must always be considered in terms of the degree or intensity of specialized technological background and experience required, with the understanding that there is a broad area of fundamental examining knowledge and training common to the entire profession.

CLASSIFYING POSITIONS IN THIS SERIES

The factors which control the grades of positions in this series are: (1) Nature and Extent of Performance of Examining Functions; (2) Contact and Commitment Authority; and (3) Technological Complexity of Art. In addition to these fundamental factors, there are two additional credit items; which, when present, warrant additional weight in evaluating positions: (1) recognition as "Expert" and (2) recognition as "Generalist."

Factor 1

Nature and extent of performance of examining functions:

Of the three primary factors, the factor "Nature and Extent of Performance of Examining Functions" is of fundamental importance, as is indicated by the heavy point weights assigned to it. The description of this factor and of its various levels is organized as follows:

First, each of the functions forming the core, or the heart of the patent examining process is described in detail. All patent examining functions, however, are not of the same level of difficulty. Some are relatively simple and easily learned, even by persons not possessing legal knowledge. Others, however, are extremely difficult and complex, and can be learned and applied only by persons who have had extensive legal training and background. Full evaluation of the overall level of difficulty of any position therefore requires that an evaluation be made of the difficulty of the patent examining functions performed in the position. To assist in this evaluation, the functions have been divided into three levels of difficulty, as follows:

Basic. -- These are functions which must be learned by all examiners at trainee levels and which are a routine part of all examinations.

Advanced. -- These are more difficult functions which (a) can be independently performed only by experienced examiners and (b) require a thorough mastery of "Basic" functions for their comprehension and application.

Legal. -- These are functions which require (a) a thorough mastery of "Basic" and "Advanced" functions, and which (b) in addition, require a sound understanding of those aspects of procedural and substantive law generally, and of the statutory and case law applied to patents specifically, which are applicable to the patent examining process.

In addition to an evaluation of the patent examining functions, consideration must also be given to how these functions are performed. As an example, a position where all functions are performed independently and without review is clearly more difficult than another position, involving the same functions, where the supervisor gives detailed instructions to the examiner, closely supervises the progress of the work and closely reviews all completed work.

The various levels of this factor have therefore been defined in terms of two aspects: (a) the nature of the patent examining functions and, (b) the manner in which these functions are performed.

Factor 2

Contact and commitment authority:

This factor is provided to measure the examiner's delegated authority to (a) exercise certain signatory responsibilities and/or to (b) authoritatively represent the Patent Office in official negotiations. Positions not possessing such delegated authority will receive no credit under this factor.

Factor 3

Technological complexity of art:

This factor recognizes complicating characteristics which are inherent properties of the assigned art itself, rather than being the result of official delegations of authority. These complicating characteristics are largely of a technological nature, but some arts possess certain significant examining complications as well.

Additional credit items:

The above primary factors measure the level of difficulty of a given job in terms of that job's functional responsibility and organizational setting (i.e., the characteristic duties and responsibilities which are assigned to the position and which are required to be performed in a particular manner). Some positions may be found, however, in which the actual level of work performed by the incumbents is significantly higher than will be indicated by the three factors described above. Two additional credit items for recognition of examiners who function either as "Experts" or as "Generalists" are provided.

"Expert" and "Generalist" positions are unique positions whose incumbents possess extraordinary personal qualifications, capacities, and recognized professional stature. The descriptions of these items explain the nature of their work in detail.

Determining grade

The grade of a patent examiner position is determined by (a) evaluating the duties and responsibilities of the position according to the factors described below, (b) determining, for each factor, which of the described levels is most nearly representative of the position, (c) adding the total number of points credited, and (d) converting this total to a grade level by means of the conversion table at the end of the standard.

FACTOR EVALUATION

Factor 1 -- Nature and extent of performance of examining functions:

This factor describes six levels of patent examining work performed in evaluating applications for patent. These levels are presented in terms of (a) the nature of the examining functions assigned (i.e., whether "Basic," "Advanced," or "Legal," as described below), and (b) the manner in which the assigned functions are performed.

Incumbents at all levels possess in varying degrees a knowledge of: (1) the theory and applications of the scientific principles of one or more of the recognized fields of physical science or engineering; (2) the techniques employed in examining patent applications, in searching prior art, and in preparing and phrasing an official Patent Office action; and (3) patent statutes and precedents, and Patent Office rules, orders, procedures and practices.

Description of Patent Examining Functions

Basic functions

Checking patent applications. -- In this step, the examiner determines whether the formal requirements of the patent statutes and rules are met with respect to the forms of specifications, drawings and petitions.

Reviewing and analyzing specifications and drawings for adequacy. -- This involves determining what structures, processes and results are being described; whether the drawings show the invention as described in the specifications; whether the limits of the improvement or invention are clearly, completely and concisely described; and whether claims are adequately supported in the drawings and specifications.

Analyzing claims. -- This involves determining whether a claim particularly points out and distinctly claims the alleged improvement or invention, by determining whether or not the claim is too verbose, includes a number of unrelated subjects ("aggregation"), recites merely a function or result without defining structure or method, or is otherwise indefinite; whether the claim falls into one of the statutory classes of invention; and what is the scope of each of the applicant's claims.

Planning a field of search. -- This is one of the most significant of the basic examining functions. Inventions usually receive a preliminary screening against the prior art by the applicant or his attorney and ordinarily only those which they feel are patentable are filed officially in the Patent Office. Each examiner is required to so plan his search that his time is used to the best possible advantage.

The most likely areas are covered first. In making such determinations the examiner is expected to exercise a high degree of ingenuity and imagination as well as a knowledge of the manner in which the prior art is organized.

Conducting a search. -- This involves comparing the structure or function described in each of the references appearing in the field of search with that of the claimed invention to determine specific points of similarity or difference.

Applying references. -- In this step, the examiner decides whether the claimed invention is in fact novel and meets the standards of patentable invention. This includes determining (a) whether any existing reference already shows the claimed improvement, and/or (b) whether a reference in some other field -- or a number of references, employed collectively -- show that the

alleged improvement would actually be, to one skilled in the art, merely an obvious consequence or adaptation of already-patented material.

Advanced functions

Applying pure theory. -- Particularly in the more abstruse scientific fields an application for a patent may be based on a scientific breakthrough which is primarily one of theory, and which involves very little structure or application. Theory itself is not patentable. Rather, it is the structure which must support the claim of patentability. The weighing of the inventor's claims against the public interest in such cases requires a sound grounding in patent practice, as well as a sound knowledge of the technology involved.

Evaluating special claim construction or arrangement. -- Special arrangements and wording of claims may in and of themselves broaden the scope of an invention. Since the potential economic value of a claim increases as the scope of the claim broadens, it is very important that the examiner allow claims only as broad as the invention clearly warrants. These are not so much legal problems, as they are problems of terminology and of the relationships of technological concepts.

Evaluating claims submitted in amendments to original application. -- Applicants may amend their applications and may attempt to claim matter which was not included in the original application. The determination that such matter was not originally disclosed is generally a difficult decision and the proper resolution of problems of this type calls for a sound background in patent practice.

Determining whether applicant should be required to restrict his claims to a single invention, rather than a plurality of claimed inventions. -- Each patent must cover one and only one invention. The determination that a given application actually covers more than one invention is another situation in which decisions are close and difficult. (Evaluating requests for reconsideration of a requirement for restriction also falls in this category.)

Recognizing and developing probable interferences. -- Different individuals and organizations frequently develop similar articles, machines, processes, or compounds, at about the same time in about the same way. Their developments often form a continuing stream of inventions. To obtain maximum patent protection they submit applications at every possible step in the perfection of their developments. The comparison of steps taken by competing applicants which are in some technological respects similar and in some respects different, call for an advanced knowledge of patent examining practice.

Deciding special situations in which applicant tries to make major changes in his application. -- An applicant may try to insert new matter in an application in various ways at various stages. The examiner must have a sound patent background to enable him to detect and to properly treat such attempts. This includes the examination of reissue applications in which the applicant asks for a new patent because of some defect in the original.

Determining operativeness and/or utility. -- This involves the determination of whether a function has been stated and is legally and morally acceptable in every sense; whether the disclosed subject will perform the stated function; and whether, if otherwise acceptable, the improvement actually accomplishes some useful or beneficial purpose.

Composing "Examiner's Answer on Appeal." -- When an appeal is made from a final rejection of an application by the examiner, the attorney files a legal brief with the Patent Office Board of Appeals. It is the responsibility of the Examiner to file a counter brief, known as the "Examiner's Answer on Appeals," in which he sets forth all grounds of rejection and reasons therefore, answers all of the attorney's arguments, and cites the pertinent precedent cases. He may also give a full and informative presentation on the development and present state of the subject-matter field involved.

Legal functions

Applying legal precedents. -- Examiner conducts legal research to determine the state of the law with respect to unusual legal issues which might develop in the prosecution of an application. This is difficult in part due to the fact that annotations and other legal arch aids are not as extensive or comprehensive in the field of patent law as in other fields of law. Evaluates the precedent cases found and determines their applicability to the case at hand.

Determining sufficiency of proof of utility. -- It is a requirement of the patent statutes that the subject matter of an application for patent be useful. In certain cases this cannot be objectively demonstrated except by tests, affidavits, and other evidence presented by the applicant. It is the job of the examiner to evaluate such evidence and determine its sufficiency in law for the purpose of proving utility.

Determining whether a double patenting situation exists. -- A single applicant may not, under law, receive more than one patent on the same invention. It is the responsibility of the examiner to determine, in situations where several applications appear to cover the same invention, whether the distinction drawn by the applicant is adequate to enable him to avoid the legal objection. The examiner must also determine whether certain actions taken by the applicant to avoid the objection are sufficient in light of the statutory requirements.

Evaluating petitions to the Commissioner of Patents. -- A variety of requests are made to the Commissioner of Patents that he take special action or overrule prior actions of his subordinates. The examiner is called upon to evaluate certain types of these petitions in terms of the legal sufficiency of evidence submitted to prove the points contended, the presence of a showing of good reason why the action requested should be taken, or the responsiveness of an answer made by the applicant to the objections of the examiner.

Evaluating affidavits as to patentable equivalence. -- In some cases, examiners may decide that a claimed invention is not patentable, on the grounds that a previous patent (cited by the examiner as a reference) has already been issued on an equivalent invention. In such a case, an applicant may contest the examiner's conclusion by submitting affidavits from expert witnesses stating that, in their opinion, persons skilled in the art would not consider the claimed invention and the invention shown in the reference as being equivalent. The examiner must determine the legal sufficiency of such submissions.

Determining sufficiency of applicant's claims as to dates. -- The dates on which the applicant conceives of the invention and on which he reduces it to tangible form are extremely important in determining certain rights under patent law. The examiner is responsible for determining admissibility and weight to be given evidence presented to prove the dates in question and that the applicant was reasonably diligent in pressing his case and had not, in effect, abandoned the attempt.

Rendering decisions on interference motions. -- As in a court of law, the applicant whose application is placed in interference may make certain requests, in the form of motions to have particular actions taken or privileges granted. Each of these must be based on the grounds and proposed in the form specified by the patent statutes. The rights of parties with respect to matters involved in these motions must be adjudicated before the final determinations with respect to the interference can be made. It is the responsibility of the examiner to determine the sufficiency of the grounds, evaluate attorneys' briefs, listen to oral arguments, and formulate a determination which will become a part of the legal record of the interference.

Determining treatment of co-pending applications. -- After the decision in an interference, if the losing party has other applications which are also pending in the Patent Office and which are based, in part, on the application which was in interference, it is the responsibility of the examiner to evaluate such other applications in order to determine whether the interference decision applies equally to them.

Determining legality of reissue oaths. -- When an applicant wishes that his patent be reissued, due to error on his own part which has caused the patent he originally received to be inaccurate, he must clearly set forth wherein his mistake lay and how it arose, and affirm that the error was due to his inadvertence and arose without deceptive intent. It is the examiner's responsibility to evaluate applicant's statements and proof and determine whether all requirements for a reissue oath have been met.

Rendering the decision on a public use proceeding. -- The patent laws require that no patent be issued where the subject matter of an application has been in public use for more than one year prior to the filing of the application. When a question as to prior public use arises in the prosecution of an application, the examiner evaluates attorneys' briefs, conducts hearings, considers requests for special privileges, and renders the decision as to whether there is a showing of public use.

Description of Levels

Level A (45 points)

Incumbents of positions of this level independently perform all patent examining functions, Basic, Advanced, and Legal. Incumbents receive no preliminary instructions from their supervisors with respect to these functions and the references which they use to determine whether or not the claimed invention is or is not new and patentable are rarely, if ever, reviewed by the supervisor. Official Patent Office actions, including "Examiner's Answers on Appeal," decisions on interference motions and on public use proceedings, are submitted to the supervisor for approval in final form.

Work of this level requires an extensive knowledge of legal precedents and policies in the incumbent's technical subject-matter area, as well as the ability to analyze testimony, to apply agency and court decisions, and to phrase final decisions with legal precision.

There is a review for conformance with Patent Office policy, if any, only upon final allowance or rejection of an application. Such review is restricted to such matters as (1) the extent to which the Patent Office will assist or advise inventors who are not represented by counsel, or (2) determination of the nature and extent of evidence needed to warrant reopening the examination of a case which has been rejected.

Level B (40 points)

Incumbents of positions of this level are responsible for independently performing both Basic and Advanced patent examining functions. They receive no preliminary instructions from their

supervisor with respect to either type of function, nor do determinations affecting either -- including the application of references and the evaluation of the breadth of applicants' claims -- normally receive close review. Official Patent Office actions, including "Examiner's Answers on Appeal," are submitted in final form. Legal patent examining functions, however (such as those involving the admissibility of evidence), are performed only after the examiner obtains preliminary instructions from the supervisor, and determinations made with respect to legal functions receive close review. References relied on by the examiner are reviewed by the supervisor only on final rejection of an application or not at all.

Level C (30 points)

Positions at this level are responsible for the independent performance of Basic patent examining functions. No preliminary instructions are received from the supervisor in the performance of these functions, nor do determinations affecting these receive close review. The patent examiner normally submits in final form Patent Office actions (documents setting forth the examiner's determinations as official decisions of the Patent Office) to the supervisor for approval. However, references relied on by the examiner are submitted to the supervisor for evaluation, and a close review is given by the supervisor to the examiner's determinations as to the breadth of claims allowable.

Incumbents also perform Advanced functions without preliminary instructions, but determinations involving these functions receive close review. Incumbents may occasionally perform some Legal functions, but only after detailed preliminary instructions from the supervisor and only under close supervision and review. In such cases, Patent Office actions (the decisions recommended by the examiner) are submitted in draft form.

Level D (20 points)

Incumbents of this level perform Basic examining functions without preliminary instructions from the supervisor. References relied upon for decisions by the incumbents, however, are reviewed in detail by the supervisors. Searches completed by the incumbents are not ordinarily repeated by the supervisors during the review. All Patent Office actions are closely reviewed in draft form.

Level E (10 points)

Incumbents of positions of this level receive extensive prior instructions from their supervisor in connection with *Basic* patent examining functions. In the light of these instructions, the examiner determines his approach, lays out his field of search, determines the references he intends to apply, and visualizes the conclusions he expects to draw. However, these matters are

discussed in detail with a supervisor or an experienced examiner before the incumbent drafts an official Patent Office action. Such drafts and all references, etc., receive close and detailed review.

Level F (5 points)

Incumbents of positions of this level perform various patent examining tasks of a simple nature. These tasks are primarily for training purposes, rather than primarily to accomplish the work of the organization. Work assignments are intended to orient employees in the application of theory and basic principles to patent examining work and to ascertain the incumbents' interests and aptitudes. Incumbents receive specific and detailed guidance and training in all aspects of work assignments.

Factor 2 -- *Contact and commitment authority*

This factor recognizes the authority delegated to certain patent examiners to act as official Patent Office representatives, as evidenced by the granting of partial signatory authority and/or of authority to commit the Patent Office to courses of action during oral interviews with applicants or their representatives.

Level A (10 points)

The examiner is officially delegated partial signatory authority (i.e., authority to make, and to effect, wholly independent determinations with respect to any Patent Office action -- his own or that of another -- which does not result in the allowance or final rejection of an application). Such delegation pre-suppose a high degree of confidence on the part of supervisory personnel in the ability of the examiner to know, properly interpret, and apply all Patent Office policies relating to the prosecution of an application. This delegation of signatory authority can therefore exist only when the examiner has achieved the highest level (Level A) of Factor 1. The importance of this delegation is such that granting of signatory authority to nonsupervisory examiners is presently done only upon the specific prior approval of the Commissioner of Patents or his designated representative.

Level B (5 points)

Full authority is delegated to the examiner to negotiate during interviews with applicants, agents and attorneys, on all questions arising in connection with Basic or Advanced patent examining functions. This delegation includes authority to reach tentative agreement with these parties upon the acceptability, interpretation or effect of language, insofar as this does not require interpretation of specific statutes or case law. Agreements so made are honored by the Patent

Office unless specifically overruled by an official possessing full signatory authority over final action.

Although examiners at most levels participate in such interviews to some extent, as a part of their development and to gain experience, the commitment authority contemplated in this level can exist only after the examiner has reached at least Level B of Factor 1.

Level C (0 points)

Positions not possessing official authorization to negotiate with applicants, agents, and attorneys or to commit the Patent Office to a course of action will receive no additional point credit under this factor.

Factor 3 -- Technological complexity of art

This factor measures the level of knowledge in terms of the scientific and technical concepts with which the examiner must be thoroughly conversant before he can effectively work in his art. The examiner, through outside reading, course work or on-the-job training, broadens his scientific knowledge and abilities and keeps up to date with the latest developments in his technical field.

Insofar as the patent examining process is concerned, one specialization is equivalent to any other. Within each broad specialization, however, there are recognizably different levels of difficulty and complexity of subject matter. In addition, other circumstances may arise during the prosecution of the application (e.g., as a result of the current state of development of the art, the source from which the application comes, its interrelationship with other fields of invention or other disciplines, or the complexity of the disclosed invention) which may further complicate and make difficult the work of the examiner.

NOTE: Technological difficulty in excess of that specifically described in this factor occurs so rarely that it is not considered necessary to provide for it in these standards. Additional point credit up to a maximum of 10 points may be allowed where it exists.

Positions not meeting at least Level B of Factor 1 will not be considered for extra credit under this factor.

Level A (10 points)

At this level, the assignments of patent examiners present technological problems of a highly advanced level of difficulty. The concepts and techniques of this advanced level require, as a prerequisite to their comprehension, full knowledge and understanding of the type of concepts described in Level C (below).

Some typical examples of such advanced concepts are: scalar and vector potentials for stationary and electromagnetic fields; electromagnetic fields involving Maxwell's equations; the wave equations in rectangular and cylindrical coordinates; various functions such as Bessel functions for large and small arguments; Hankel functions, and spherical and modified Bessel functions; impedance discontinuities in guides -- resonators; and so forth.

For a position to be credited with this level of technological complexity, the work must clearly require any incumbent of the position in question to have a mastery of the concepts involved.

Level B (5 points)

At this level the art examined involves technical problems of considerable difficulty. This difficulty may be the result of applications covering complex systems (Type 1), or the difficulty may arise from the nature of the prosecution, examination, or range of subject matter knowledge involved (Type 2).

Type 1 -- Systems

In this situation, the applications involve one or both of the following:

Multiple systems, where the system for which a patent is sought is composed of two or more sub-systems, each of which is based on the fundamentals of different technological disciplines. For example:

A multiple system is exemplified by a Bundle Packaging and Wrapping Machine consisting of a sub-system of mechanical components (including rollers, tapes, supports, rotary shafts, bearings, compressor, wirelaying rings, guide sheaves, drive mechanism, slack take-up mechanism, supply coil, gripper head, spring-loaded tension unit, etc.), all moving relative to one another and operated by a second sub-system, this one of electrical components (including a main power circuit and a plurality of control circuits, each embracing a variety of a switch types, solenoids, push-button stations, bypassed, reset means, power conversion units, rheostats, transformers, fuses, selenium rectifier stacks, a variety of contractors, etc.).

Complex systems, where the system is composed of a network of components, the voluminous interrelationships of which are expressed in concepts involving either a very high level of abstraction, or requiring such detail that numerous pages of drawings and specifications are required. The system or systems are substantially dynamic, rather than static in nature, with the

forces or bodies in motion being relative or causative to a plurality of other forces or bodies also in motion (i.e., the parts and forces comprising the system are moving and affecting one another). For example:

A system expressed in abstract concepts is exemplified by an Electronic Magnitude Comparator, which compares and indicates the relative magnitude of two numbers -- expressed as two sets of binary coded electrical digit signals -- by comparing the relative magnitudes of the corresponding digit signals. The values of the numbers to be compared are expressed in terms of electrical pulses and introduced to the comparator through separate input source means, monitored by a clock pulse means, and registered by means of bistable elements employing the binary concept. The expression of this concept is in the form of equations of Boolean algebra, a symbolic logic system which facilitates the representation of input data in machine language.

Type 2 -- Examining Difficulties

In this situation, the examination of the art is complicated by *two or more* of the following elements:

Highly competitive art. -- The art is a very active one in which, due to the commercial importance of the subject matter, the cases are vigorously contested by eminent counsel, both as to ex parte and inter partes matters, causing extended prosecution and the consideration of numerous special scientific and legal papers. For example:

An example of a particularly active and competitive art is that of resilient tires. Increases in vehicle speeds, such as the landing speeds of jet aircraft, cause serious problems of tire dynamics and polymer chemistry. Efforts to solve these problems have resulted in particularly keen competition throughout the industry, since a break-through invention -- or even a lesser improvement which has strong appeal -- may result in marked shifts in the share of the market among those in the industry. A large proportion of these tire applications therefore undergo vigorous and extended prosecution before the Patent Office and there is a great deal of pressure on the examiner to make the most precise possible technical and legal distinctions. Even relatively slight areas of disagreement may result in appeals, interference actions and infringement suits in which the examiner's findings may be vigorously attacked. The examiner constantly faces the most persistent prosecution by the most able attorneys

available, especially during oral interviews and hearings, and is often confronted with technical problems of the utmost complexity by the special papers and actions which are filed.

Very broad fields of search. -- The art requires fields of search which are frequently varying and divergent, presenting numerous and differing problems of the analogousness of different arts, the necessity of evaluating extremely fine technical distinctions, the great number of permutations and combinations, and the practical requirement of limiting the possible fields of search to those likely to produce the best results. For example:

An example of varying and divergent fields of search occurs in the examination of processes of mechanical manufacture in Class 29, "Metal Working", which frequently involves a consideration of, and a search of, several major metal working classes (such as forging, drilling, bending, cutting, casting, etc.), as well as in the manufacturing classes involving other materials than metals. Further, since almost every such process involves the manufacture of some article, the examination frequently involves consideration of the class where the article as a finished product would be classified, as well as consideration of classes where analogous articles are classified and/or classes where articles of a different nature are classified which may disclose pertinent procedural or processing steps. In view of the multitude of products that are manufactured, the search fields of this art thus seldom follow a stable pattern.

Variety of subject matter. -- The art embraces subject matter which requires for its comprehension a mastery of the scientific or technical concepts basic to more than one discipline. For example, in an application for a Paint Mixing Machine, concepts drawn from both Mechanical Engineering and Electrical Engineering -- each of which is significantly involved -- are employed extensively by the examiner, as is shown in the following description of the apparatus:

.....plurality of liquid reservoirs, a dynamically brakable electric motor, motor-driven means for producing relative movement between the reservoirs and a container to receive liquid therefrom; circuit means for dynamically braking the motor; a presettable selector for actuating a circuit to stop the motor when a particular reservoir preselected by the selector is positioned to dispense liquid into the container; a pump for dispensing the liquid; means including a power operated shaft for driving the pump; a cyclically operative circuit control actuated by the shaft along with the pump and repeatedly responsive to successive equal angular displacements thereof during dispensing operation of the pump; a stepping switch controlled by the cyclically operative circuit control; terminating means responsive to the stepping switch; and means for restoring the stepping switch to its normal position.

Level C (0 points)

At this level, arts do not involve the unusual technological and other complicating characteristics described above. As such, they receive no special additional credit under this factor. Rather, they involve problems which can be solved by proper application of the fundamental concepts and techniques basic to the given scientific specialization.

Typical examples of such basic concepts include the following:

- (1) Engineering mathematics through differential and integral calculus;
- (2) Descriptive chemistry;
- (3) Classical physics;
- (4) The engineering sciences, usually including
 - (a) Mechanics of solids (statics, dynamics, and strength of materials)
 - (b) Fluid mechanics
 - (c) Thermodynamics
 - (d) Transfer and rate mechanisms (heat, mass, and momentum transfer)
 - (e) Elementary electrical theory (fields, circuits and electronics)
 - (f) Nature and properties of materials; and

- (5) Specialized concepts unique to the particular subject-matter specialization. Typical examples of these are the following:

Metallurgical Engineering. -- Such concepts as melting points, tensile strength, yield strength, hardness, elasticity, density, boiling point, transition temperature, thermal expansion, specific heat, heat of fusion, and thermal conductivity are applied.

Food Technology. -- Such concepts are applied as flow of heat and flow of liquids, extraction, evaporation, distillation, drying, filtration, etc., as normally encountered in connection with the products and technological processes of the meat, fish, and dairy industries, as well as special technical procedures involving heat penetration, sterilization, preservation and packaging.

ADDITIONAL CREDIT ITEMS

Described below are two conditions -- operation as a Generalist or recognition as an Expert -- which are not treated in the three classification factors described above. When one of these conditions exists with respect to a given patent examiner position, it will have a direct bearing on the grade level of the position.

These conditions are as much concerned with the capabilities of the incumbent as they are with the nature of the work. The difficulty of the task and the breadth of responsibility exercised are largely the result of the individual's ability to fulfill the requirements of either the Expert or the Generalist position.

Since these conditions tie in only indirectly with the normal position classification factors, they are treated separately from the three broad factors employed in these standards. Each is considered as an additional credit item and, where one occurs, extra points, as indicated, are added to the total point score achieved under the three basic factors before the total of points is converted to grade. Credit may not be granted for both items (i.e., Expert and Generalist) in any one position.

To receive credit for either, the art examined must possess at least one of the five complicating characteristics described under "Type 1" and "Type 2" of Level B of Factor 3.

Expert (10 points)

An incumbent at this level is recognized and operates as a full technical expert in his assigned area of technology, especially with respect to questions of operativeness and technological equivalence.

The Expert has a foundation in patent examining functions at least the equivalent of that described in Level B of Factor 1, *Nature and extent of performance of examining functions*. In addition to examining knowledge, however, the examiner has so mastered the technical concepts and very latest developments in the specialized areas which constitute his art that he has become a recognized expert in his technological field.

To warrant consideration for Expert, the incumbent's subject-matter area must cover a significant portion of the total subject matter included in the art to which he is assigned. Examples of arts of sufficient scope for consideration for Expert are: (1) Cathode Ray Tube Circuits, within the broad field of Space Discharge Systems; (2) Antibiotics, within the broad field of Medicines; and (3) Metal Forging and Welding, within the broad field of Metal Working.

The factors which exemplify the Expert examiner in a given art are:

- (a) the examiner's ability to resolve, with finality, questions of operativeness and technological equivalence between subjects falling within his field of technical specialization;

- (b) the examiner's ability to discuss on equal terms with industrial experts who may be involved, the very latest developments and the very finest distinctions which may be drawn in each of the several highly specialized technical areas within his art;
- (c) recognition of the examiner by ranking officials of the Patent Office as speaking with authority on questions of operativeness and technological equivalence arising within his art;
- (d) reliance on the examiner's recommendations with respect to technical matters in his art by other examiners who bring to him for authoritative solution, problems of patentable equivalence and analogousness of arts which they have been unable to resolve;
- (e) reliance by patent attorneys outside the Patent Office on the examiner's suggestions with respect to developmental trends, profitable areas of search or breadth of claims, and referral to him for expert advice aimed at giving the patent attorneys the proper perspective in handling cases in his art;
- (f) mastery by the examiner of the semantics of each of the specialized areas within his subject matter field, and reliance, on the part of the Board of Appeals, Board of Interference Examiners, Solicitor, attorneys, examining corps and the Federal courts, on the examiner's conclusions as to the precise denotation, at any given time, of particular technical terminology and the connotations and shades of meaning to which it gives rise when used in connection with given subject matter;
- (g) the examiner's knowledge of the past development of his art, his ability to foresee trends, and his ability to informally reclassify those areas in which there has been the greatest growth and to organize his reference materials to meet the peculiar needs of each specialized area; and
- (h) reliance on the examiner by patent classifiers, during extensive reclassification projects embracing his art, for the broad lines along which his field has developed, the probable areas of future growth, and for expert guidance as to the structural or functional aspects of the subject matter which appear to be significant and which, if built into the patent classification system, would facilitate searches.

Generalist (5 points)

The technical area within which a Generalist is required to operate normally embraces all arts over which his organizational unit (usually consisting of 10 to 15 examiners) has jurisdiction. Examples of broad fields which are of sufficient scope for consideration for Generalist are: (1) Space Discharge Systems; (2) Medicines; and (3) Metal Working.

The Generalist is an examiner who, although not performing as an Expert in any one art, has developed such a broad technical background in the several arts of his organizational unit, has acquired such a familiarity with prior developments in these arts, and has such a solid foundation in patent examining functions (at least the equivalent of that described in Level B of Factor 1), that he is able to regularly perform assignments in any and all of these several arts at a level fully equivalent to that normally expected of an experienced examiner specializing in one art alone.

Identification of an examiner as a Generalist is warranted only when work of the above-described level and variety is a regular and recurring -- not an occasional or temporary -- part of the continuing duties and responsibilities of the position.

POINT-TO-GRADE CONVERSION TABLE

Grade	Points
GS-5	less than 10
GS-7	10-15
GS-9	20-25
GS-11	30-35
GS-12	40-50
GS-13	55-60
GS-14	65-70
GS-15	75-80

/*/ This standard was prepared by the Patent and Trademark Office and the Office of Personnel Management.