

Position Classification Standard for Patent Classifying Series, GS-1223

Table of Contents

SERIES DEFINITION.....	2
SPECIALIZATIONS.....	2
PATENT CLASSIFICATION AND THE PATENT SYSTEM	2
THE PATENT CLASSIFICATION PROCESS.....	5
CLASSIFICATION FACTORS.....	10
PATENT CLASSIFIER, GS-1223-12.....	12
PATENT CLASSIFIER, GS-1223-13.....	14
PATENT CLASSIFIER, GS-1223-14.....	16

SERIES DEFINITION

This series includes all professional, scientific, and technical positions which are primarily concerned with developing and/or administering systems for the classification, for patent purposes, of the technological knowledge embodied in United States patents and related material.

SPECIALIZATIONS

The following specializations are recognized in this series and should be added parenthetically to the basic title, e.g., Patent Classifier (Chemical Fields):

Chemical fields. -- Positions requiring a specialized knowledge of the principles, practices, theories and phenomena of organic and inorganic chemistry or any phase of engineering and chemistry concerned with the design, erection, and operation of chemical plants and laboratories and the apparatus and processes employed therein.

Electrical fields. -- Positions requiring a specialized knowledge of the principles, practices, theories and phenomena of electrical engineering and/or electronics.

Mechanical fields. -- Positions requiring a specialized knowledge of the principles and practices of mechanical engineering and mechanics, such as thermodynamics, hydrodynamics, metal shaping and cutting, principles of kinematics and kinetics, and so forth.

General. -- Positions requiring a specialized knowledge of the principles and practices of any field of science or technology other than those specifically covered by the other specializations of this series, or positions in which a knowledge of two or more of the specialized fields is required.

PATENT CLASSIFICATION AND THE PATENT SYSTEM

Under the Constitution, U.S. patents are issued "to promote the progress of science and the useful arts by securing . . . for limited times . . . to inventors the exclusive rights to their discoveries." In issuing a patent, the Government guarantees to an inventor a 17-year legal monopoly on all use of his invention, in exchange for his full public disclosure of his invention and on the condition that, when the patent expires, the invention becomes the public property available to all. The basic mission of the patent system thus is two-fold: (1) to grant patent protection to all inventors making original and useful advancements in science and technology; and (2) to make these advancements available to all. The patent classification system plays an essential part in the achievement of both of these goals.

The number of inventions which have received U.S. patents runs into the millions. The number of inventions which have received foreign patents (e.g., in Canada, Great Britain and Germany),

plus those unpatented innovations which are embodied in scientific and technical literature and publications, add additional millions of items to the total bulk of all that is known and all that has been done in the many branches of science and technology. It would be impossible to search through all this material every time a particular type or item of information is needed. In order for the patent system to fulfill its basic mission, then, some way must be found to organize all these many diverse areas of knowledge and activity and to break them down into units of manageable size. This, basically, is the purpose of patent classification.

Role of Patent Classifications in the Patent Process

Before a patent application can be either approved or rejected, it must pass through an extensive process of examination. Patent classification plays an important role in almost every stage of this examining process.

When an application is first received by the Applications Division, for example, the first thing that is done is to classify it, i.e., to determine, in accordance with the instructions of the patent classification staff, to which of the hundreds of classes and thousands of sub-classes the particular "invention" claimed in the application belongs. On this basis, the application is assigned to a particular examining division for processing (the examining divisions are organized and staffed according to the nature of the classes and sub-classes of inventions which they are assigned).

Within the examining division, the key determination of the entire examining process is made: whether or not the claimed "invention" constitutes a significant and useful advance over what is already known -- i.e., whether or not the claimed "invention" is in fact new and patentable. In the gathering of information on which to base this key determination, the adequacy or inadequacy of the patent classification system which has been set up to cover the given class or sub-class of invention is of critical importance.

The task of creating a classification system which will adequately cover all of the thousands of diverse items found in even a relatively small class of inventions is extremely complex. A given group of inventions can be broken down in many different ways, each of which has its own unique combination of advantages and disadvantages. For example, a given area of manufacturing may be broken down according to the different materials used, such as metals, wood, plastics, or ceramics. Or it might be divided according to the process used, such as milling, molding, planing, drilling, routing, sawing, stamping, casting, and so forth. Or it might be broken down according to the end product resulting, such as bearings, screws and bolts, nails, sheets, corrugated and sandwich materials, and so forth. Or it might be divided according to ultimate purpose or use, such as containing pressurized gases, liquid storing and dispensing, or material handling. The list of possibilities is almost endless.

Whatever system is devised for classifying any given group of patents, however, that system divides them in one -- and only one -- of many possible ways, to the exclusion of all other ways. Each group resulting from the application of a particular system is therefore homogeneous -- but only to the extent that all the included inventions share that one particular feature which the system considers most significant. And each group is complete -- but only in the sense that it

includes all inventions in which the designated characteristic feature is the primary feature of the application.

This degree of homogeneity and completeness is adequate for most of the Patent Office's organization, personnel and work assignment needs. But it is seldom completely adequate for the overall determination of whether or not a particular claimed "invention" is in fact new. In making this key determination, the examiner must search out all previous developments which may be related to the claimed "invention.@"

Each individual patent application in a given class or sub-class normally presents, in addition to that primary feature which is characteristic of the class, a unique combination of other, secondary features which are also significant parts of the claimed "invention.@" Thus, before he can conclusively determine whether or not the total package of features constituting the "invention" is in fact new, the examiner must search for possible precedents in more than just his own assigned class or sub-class. He must conduct a search, for each application, which will cover all significant features of the claimed "invention". This search must cover all other classes and sub-classes, out of the thousands which exist, which are likely to contain features (or combinations of features) bearing on the total "newness" of the claimed invention.

If this search reveals (a) that an identical or substantially comparable invention has already been patented (even if it was for a somewhat different purpose or is located in another class), or (b) that the "invention" (or an equivalent) has actually been long known to persons skilled in the particular subject-matter area (as evidenced by its prior appearance in scientific and technical literature and publications), or (c) that, to such skilled persons, the claimed "invention" is really only an obvious combination of several other already well-known and/or previously-patented inventions, then the claimed "invention" would not merit a patent, since it would not in fact be an advance over what is already known.

The classification system for a given class, then, must do more than merely divide thousands of inventions into separate and discrete units. It must also provide, for each unit and at every step of the patent process, the comprehensive and flexible system of cross-referencing necessary for the patent examiner working on that class to effectively and efficiently search out all that is known on each new claimed invention.

Patent Classification and the Public

When a patent application has been approved it must be classified and coded to its proper class and sub-class, and adequate cross-references established to insure the future availability of the material to those who will have need of it. One of the groups who will need this material will, of course, be patent examiners, in connection with the examination of subsequent applications. However, this information will be needed by many other groups as well, and for a variety of purposes.

One purpose for which patent information is requested (and supplied) is to acquaint the interested public with the exact nature and capabilities of newly-patented inventions. A manufacturing and distributing organization, for example, may ask about a particular new

invention because they might be interested in manufacturing and selling it; thus the inventor can find his producer. Or an individual or firm may be interested in a particular invention because its use might meet a particular pressing need for them; thus the inventor can find his buyer. Or a research organization may inquire and find that a problem on which they have been working has already been solved and the solution patented.

Patent information may also be supplied on particular areas of activity. A firm with a general problem area, for example, may thus turn up several prior inventions which would be of assistance. Some may be covered by pending patents; in this case the inventor continues to receive the rewards of his efforts. Other patents may have expired and the inventions passed into the public domain; in these cases the user -- without cost -- gains useful knowledge which, but for the patent classification system, might never have been publicly disclosed.

Research personnel and inventors also have an interest in ascertaining all that is already known in a particular area. Research personnel, by knowing what has already been done, can focus their efforts on problems which have not yet been solved and on questions which have not yet been answered or which have not been answered fully. And inventors (or their attorneys or agents) can determine, on the basis of their evaluation of the patents already issued in the given field, whether or not to apply for a patent on a particular development.

Thus, providing the public with ready access to full knowledge of everything which has -- and has not -- been done in particular areas can both make available to all the fruits of past inventive activity, and stimulate and promote progress in all fields of science and the useful arts.

THE PATENT CLASSIFICATION PROCESS

The patent classification process consists of two primary types of work: (1) classification systems administration, and (2) classification systems development. The nature of a given incumbent's responsibility for the performance of each of these different types of work will have a direct bearing on the grade level of the position.

(NOTE: For the purpose of the following discussion, the term "system" is defined as that body of classification material -- including definitions, notes, precedent decisions, cross-references, etc. -- which is applicable to one class of invention.)

Systems Administration

Systems administration work requires, at full performance levels, an extremely broad range of qualifications, knowledge and training. The patent classifier performing systems administration work at that level must (a) possess a knowledge of the principles and practices of a number of specialized areas of science and technology, (b) have a sound background of training and experience in all phases of patent examining work, and (c) possess both a comprehensive knowledge of all aspects of the classification systems established for a number of major classes of inventions, and a sound working knowledge of the systems and content of all classes of invention which are related to his own.

As (a) and (b) indicate, there is a close relation between the work and qualification requirements of patent examiners, on the one hand, and those of patent classifiers who are engaged in systems administration work, on the other. So close is this relation that, at the present time, patent classifier vacancies are filled solely from among the ranks of experienced patent examiners.

There are significant differences between patent classifiers and patent examiners, however. For one thing, the classifiers deal primarily with basic and advanced patent examining functions, which primarily involve technological, rather than the most difficult legal functions. The main differences, however, are centered primarily on the differing breadth of the areas of invention to which they are assigned and on the differing nature of their responsibility for these areas.

To understand the nature and complexity of these differences, it is necessary to have a clear understanding of the extensiveness and complexity of a "class." The total body of scientific and technical knowledge with which patent classification must deal consists of more than 3,000,000 U.S. patents, several more millions of cross-references, and several millions of additional items, including both inventions which have received foreign patents, and those unpatented innovations, techniques and practices which have been embodied in the scientific and technical literature and publications of the United States and foreign countries. This enormous mass of material has been divided by the patent classification staff into approximately 350 major groups, or "classes" of inventions.

On the average, a single class of inventions contains 300-500 separate and distinct sub-classes and typically covers about 10,000 U.S. patents, plus an approximately equal number of items of additional related material, as described above.

The area to which an experienced patent examiner is assigned usually consists of a group of sub-classes, which group constitutes a significant portion of an entire class of inventions. And the nature of his responsibility for his assigned area is quite different from that of the Patent Classifier in relation to his area. As is indicated by the size of the average class, such an area represents a wide range of scientific and examining activities and problems -- in all of which the patent examiner is required to be competent.

The area for which a journeyman patent classifier is responsible is far broader. Typically, a patent classifier is required to have a thorough knowledge both of the technology and of the established classification systems of as many as 10 complete classes of invention -- an area which includes an average of 3,000-5,000 separate sub-classes and up to 100,000 U.S. patents, as well as many additional thousands of supplementary items (cross-references; etc.). One of the primary differences that distinguishes patent classification systems administration from patent examining work is the extreme breadth of knowledge required of the classifier, as compared with the greater intensity of knowledge in a more narrow area which is required of the patent examiner.

Systems administration includes two primary types of work: (1) providing authoritative information, guidance and assistance to patent examiners, patent classifiers and other members of the Patent Office staff, and to inventors, applicants, attorneys, agents and other interested members of the general public, on those patent classification matters which pertain to a broad

range of classes and sub-classes of invention; and (2) overseeing and guiding the implementation, in all stages of the patent process, of the classification systems which have been developed for particular classes of inventions.

An example of the first of these two types of work occurs in the laying out of fields of search. Each patent application presumably presents a unique combination of features. To determine whether or not the total "package" of features is in fact new, a patent examiner must search out all possible precedents for these features (and/or combinations thereof). Such searches frequently take the examiner far beyond the limited area with which he is familiar. In such cases, the patent classifier may be called upon for assistance.

In giving this assistance, the patent classifier must apply all the different types of knowledge and training described above. First, he must grasp the nature and significance of all technical features of the claimed invention; thus he must possess and apply a knowledge of the pertinent field(s) of science and technology on which these features are based.

Second, he must have a sound understanding of basic and advanced patent examining functions so he can understand the nature of the examiner's needs and adequately meet them.

Third, the patent classifier, when called upon, must advise the examiner as to (a) which specific classes, sub-classes, and further sub-divisions, out of the thousands which exist, are most likely to contain precedent material which may have a bearing on the "newness" of one or more features of the particular claimed invention; (b) which classes, etc., although appearing to be appropriate, it would actually be unprofitable or impractical to search; and (c) which specific combination of classes, etc. searched would be most likely to produce the maximum of pertinent precedent material within the limitations of available time and resources.

One brief illustration should indicate the breadth and scope of this information function.

Application "X" concerns a rotary abrasive tool, made of hardened, treated steel, with self-sharpening and self-cleaning features. Since this tool can serve many purposes beyond the simple tool field, the examiner requests the assistance of a patent classifier in laying out a field of search. As described in the application, the tool could be used for drilling, cutting, boring, routing, grinding, shaping, scoring, and even making letters and designs on such diverse materials as metals, wood, plastics, ceramics, composition boards, sandwich materials, and even some types of minerals and stone. The patent classifier must assist and guide the examiner in laying out a field of search which will cover all pertinent portions of all of the dozens of classes and sub-classes -- almost all of which are outside the area with which the examiner is familiar -- in which such functions, uses and devices are found.

The patent classifier also provides this same type of information and assistance to other persons; e.g., other Patent Office officials (division chiefs, other patent classifiers, etc.), as well as applicants, inventors, attorneys, agents, patent searchers, businessmen and other members of the interested public.

The second primary type of systems administration work -- that of overseeing the implementation of established classification systems -- also required that the patent classifier possess the broad scope of knowledge described above. Generally speaking, however, the most

important characteristic of this type of work is the fact that each class of invention is covered by an established classification system. Basically, then, "current work" is concerned with the application of these established systems to individual problem cases as they arise.

Problem cases can arise in several ways. Initial classification of newly-received applications is done by the Applications Division, and the applications are then routed to the appropriate examining division for examination. If this initial classification is disputed by the receiving division, the patent classifier is responsible for authoritatively classifying the application to its proper place in the over-all patent structure and for resolving the dispute. Similar action is required in cases where the dispute is between various patent examiners or between examining divisions (although in the latter case, the patent classifier's decision is formally approved by his supervisor).

Problem cases can also arise where an application discloses a new technological feature or combination for which there are no classification precedents. In such cases, it is the job of the patent classifier to prepare a precedent decision to both classify the individual case and to guide the actions of all segments of the patent operation in handling all future cases of this type.

Finally, it is the functional responsibility of patent classification to ensure the proper classification of newly-patented inventions, a task which is of great importance in assuring the future availability -- to both examiners and to the general public -- of newly-disclosed advances.

The effectiveness with which a patent classifier thus implements the established systems in his assigned area of technology, and the effectiveness with which he provides, by means of precedent-setting decisions, for the proper coverage of new developments in his assigned area, can have a significant bearing on how well the patent system fulfills its Constitutional responsibilities for protecting the just interests of inventors and for making available to the public the fruits of science and of the useful arts.

Systems Development

The need for systems development work occurs when the system provided for a particular class or group of patents has broken down and is no longer adequate to the demands placed upon it. In this situation, it is the job of the patent classifier engaged in systems development work to develop a new system which will be adequate.

An existing system can require replacement for several reasons. In one type of case, the system becomes inadequate because of a major breakthrough into completely new areas of knowledge, such as occurred in the development of controlled nuclear fission, or in the discovery of transistors and other solid-state devices and phenomena. Such breakthroughs can open up literally hundreds of new avenues for applied scientific research, and can result in floods of new patent applications of a type for which the old system provides neither precedents nor guidelines. In the more common situation, however, a new system is needed because the existing one has become simply out of date and inadequate for the current state of technology.

The chief characteristics of systems development work are (a) need for not only great breadth and variety of knowledge, but also for great intensity of knowledge of the area of assignment, and (b) need for unusual originality and creativity.

As indicated above, a single class of inventions is a very large and complex group of material. The average class contains 300-500 separate sub-classes and as many as 10,000 individual patents, plus additional thousands of items of supplementary material. When an adequate system exists, the system permits the examining divisions to handle perhaps 85% of the classification cases on a routine basis; thus the patent classifier responsible for the administration of the system receives only the (roughly) 15% which are classification problem cases. Where there are well developed systems, the patent classifier can be assigned responsibility for a number of classes, sometimes as many as 10. When no adequate system exists, however, and every single piece of material in the class must be individually and separately examined and evaluated, no such broad assignment is possible. In systems development work, then, the average project seldom exceeds the size of one average class in scope. But what this average size of assigned area lacks in breadth, it more than makes up for in depth and complexity of the problem involved.

Systems development work requires an unusual degree of originality on the part of individual patent classifiers. In their work they are not bound by any predetermined pattern or established system. The only restrictions which exist on the free exercise of their originality are those which are imposed by the nature of the material which must be covered and those which are inherent in the many problems and needs which the new system must serve.

Each systems development project presents a unique combination of technological, examining, and classification problems. Further, there are more possible classification systems than there are patents. Each project must therefore be handled individually and on its own merits, and seldom will the resulting classification system be directly comparable with any other existing system. In spite of the many differences in project and product details, however, most projects involve the following types of functions and considerations:

Analyzing the assigned group of patents; identifying the common and the differentiating features of the various types and groups of patents presently found in the given class; determining the nature of the interrelationships of these items; excluding from project coverage those patent which are more appropriately covered elsewhere and/or extending the project's coverage to include closely-related groups of patents which may be currently classified elsewhere; evaluating, for possible use in the new system, the strengths and weaknesses of the existing system (if any) covering the assigned group and/or the techniques and criteria used in other, related arts; and specifically identifying those unique features and provisions which the new system must have to be adequate.

On the basis of the above, and using a combination of both known and specially-developed classification techniques and terminology, the systems developer must formulate and define a new classification system and class structure which will meet the following criteria:

It must adequately cover all of the many hundreds of unique groups, sub-groups, combinations and patterns which are found in the assigned body of patent material.

It must differentiate the total body of material from all other classes of patents which are found in the Patent Office.

It must divide and sub-divide the assigned material in a manner which (a) is consistent with the latest advances of knowledge, theory and practice in the field(s) of technology involved; (b) is appropriate and usable in all the operations and for all the needs of those who will use the system; (c) takes into account recent trends in receipts and activity in each of the areas of invention found in the class; and (d) makes provision for the needs and the likely developments of the foreseeable future.

CLASSIFICATION FACTORS

Two primary factors govern the grades of positions in this series. These are: (1) Nature and complexity of assigned functions; and (2) Level of performance.

Factor 1: *Nature and complexity of assigned functions*

As indicated above, the overall patent classification process involves two types of work: systems administration and systems development. The nature and scope of an incumbent's assignment will have a direct bearing on the grade of the position.

Systems administration responsibilities are assessed by the following measures:

Breadth and variety of assigned classes. -- This indicates the breadth of knowledge of classification systems which the position requires. Performance of this function involving only a few closely-related classes means that the incumbent must have a thorough knowledge of only these few classification systems, plus a working knowledge of only a few closely-related systems. However, performance of this function for a range of classes, some of which are only remotely related to each other, requires that the patent classifier have a thorough knowledge of a much greater number and variety of classification systems, plus a working knowledge of the still greater number of systems which have a bearing on the many dissimilar classes for which the classifier is responsible. The greater number of classes for which the incumbent is responsible, the greater the range of problems which he must handle and the greater the range of person-to-person contacts he has, both with respect to individual examiners, and with respect to disputes between examining divisions.

Areas of technology involved. -- This element deals with the breadth and variety of technological knowledge and qualifications which the patent classifier must have to do his work. These qualifications are measured in terms of the number of "areas of technology" represented in his work.

An "area of technology" is defined as a group of closely-related classes which would normally be assigned to one patent examining division. An example of such closely-related classes is found in the following classes, which are assigned to one examining division: Motor Vehicles, Land Vehicles, and Land Vehicles (Bodies and Tops).

Some patent classifier positions work in only one "area of technology." Others are required to work in (and thus must know) two or more such areas.

Systems development responsibilities are assessed by the following measures:

Nature and scope of assigned project. -- As indicated above, systems development work is very complex, involving many phases, many considerations, and a great variety of duties. All of these affect each patent within the assigned group; every patent must be considered and dealt with individually. In general, then, the greater the number of patents which a given patent classifier must deal with, the more difficult his job. Some patent classifiers deal with only a few hundred patents out of a class of many thousands. Others deal with entire classes embracing perhaps 10,000 to 20,000 separate patents.

Areas of technology involved. -- As in the case of systems administration, this is a measure of the breadth and variety of the scientific and technical knowledge and qualifications which are required of the patent classifier. Given two assigned groups of patents which are of equal size but which differ in this technological variety, the group which involves two or more areas of technology is more difficult than the group which involves only one.

Factor 2: *Level of performance*

Factor 1 deals with the nature and complexity of the patent classification project to which the patent classifier is assigned. Factor 2 deals with the nature of his responsibility for the project and with the manner in which he must carry out his responsibility. The level of performance is assessed by the following measures:

Independence of operation. -- This refers to the degree of independence with which the patent classifier works and to the nature and extent of the review which is given to his work by his supervisor. Some incumbents operate with substantial independence from technical supervision. Other positions are subject to greater or lesser degrees of supervision and review. Also considered in this element is the degree of authority which the patent classifier has been delegated. The decisions, conclusions, recommendations, and commitments of some incumbents are considered authoritative and binding on all concerned. Other incumbents have only limited authority on patent classification matters, or have authority for only a much more limited area of activity (i.e., a smaller group of patent classes).

Degree of systems development project responsibility. -- Some systems development positions have responsibility for both the conduct and the technical and classification adequacy of all phases and products of an entire project covering many thousands of patents. Others have

responsibility for only a portion of such a major project, or are responsible for only a very small project covering, at most, a few thousand items. The degree of responsibility which the incumbent has for his assigned project is directly related to the intensity of technological and patent classification knowledge which he is required to have. It is also indicative of the nature and magnitude of his responsibility for the explanation and "selling" of the new system (the project leader is responsible for placing the new system into operation, as well as for developing it).

PATENT CLASSIFIER, GS-1223-12

Typically, the Patent Classifier, GS-12, is primarily concerned with the performance of systems administration work, as described below. However, the patent classifier at this level is also introduced to systems development work, by means of assignment to projects (or portions of projects) which are of limited extensiveness and difficulty.

SYSTEMS ADMINISTRATION RESPONSIBILITIES

Nature and complexity of assigned functions

Systems administration work at the GS-12 level involves performance of this function for an assigned group of patents which is of limited variety and size. Typically the assigned group of patents consists of a few (e.g., 1-3) average-sized classes of invention, all of which involve substantially the same area of technology. The following is an example of work assigned to GS-12 incumbents:

A typical assignment at this level involved the administration of the established classification systems covering the following group of closely related classes:

Motor Vehicles
Land Vehicles
Land Vehicles (Bodies and Tops)

These are classes of average size and involve only one specialized area of technology. The incumbent is responsible for maintaining the integrity of the existing systems governing patent activities within these classes and for resolving disputes concerning the proper application of these systems to individual cases.

The systems administration position in GS-12 thus has responsibility for a considerably less extensive number of patents and classes than do positions in GS-13. Because of this, the number of classification systems which the GS-12 must know and apply is considerably less than at the GS-13 level. Further, because the small group of classes which are assigned to GS-12 positions are all closely related and involve, for practical purposes, only one area of technology, the individual systems themselves are less complex than those which are characteristic of the GS-13 level.

Level of performance

GS-12 incumbents perform their work with substantial independence from technical supervision within their assigned group of classes. They are expected to refer unusually difficult cases or cases requiring policy determinations to their supervisor. They also may request his assistance and guidance on cases which have possible impact or implications for other classes of invention over which the incumbent does not have assigned authority and responsibility. However, they are expected to handle the vast majority of cases and technical problems occurring within their assigned group of classes without supervisory guidance or assistance.

The decisions, conclusions, recommendations and commitments of the patent classifier are considered, insofar as they concern his assigned group of classes, to be authoritative and, in most cases, final. This degree of authority, however, is restricted to the incumbent's assigned groups of classes only; decisions, etc., affecting other classes are subject to close review by his superiors, who retain authority to approve or disapprove such actions.

SYSTEMS DEVELOPMENT RESPONSIBILITIES*Nature and Complexity of Assigned Functions*

GS-12 systems development work is of limited scope and complexity. Incumbents typically deal with either a specific portion or phase of a large project embracing many thousands of patents, or with a small project (i.e., a project usually involving several hundred -- or at most, a few thousand -- patents). In either case, however, the project normally involves only one area of technological subject-matter knowledge and covers less than one average size class.

An example of an assignment meeting these criteria occurred in a project for reclassifying a group of patents relating to the uniting of metallic work pieces by either (1) applying molten metal to the joint area, or (2) melting the contacting areas of the parts to be joined. The existing method of breaking down this collection of patents into smaller groups had become inadequate because of the increasing number of patents issued in this field. The job of the patent classifier was to devise a new system for sub-dividing this group of approximately a thousand patents into sub-groups which would be of manageable size, and to prepare the schedule, definitions, and notes required to implement the new system. The work of the patent classifier was closely reviewed by the supervisor at each stage in the process of the project.

Such typical GS-12 assignments differ from those typical of the GS-13 level in two ways. First, the number of patents involved is generally somewhat smaller at GS-12 than at GS-13. This difference is significant primarily because the larger the number of patents, the more complex the resulting systems.

Second, GS-12 assignments, for practical purposes, involve only one area of technology, rather than the two or more that are characteristic of the GS-13 level. This is a more significant difference between the two levels. Increasing variety of technology not only requires increasing

variety and scope of technical knowledge on the part of the patent classifier; it also increases the difficulty of creating the new system -- one of whose primary purposes is to more adequately cover the latest trends and technical developments in the assigned areas of technology. Thus the qualifications required of the patent classifier and the variety of considerations which enter into the development of the new system both increase as the number of areas of technology increases.

Level of performance

An important difference between systems development jobs at GS-12 and those at GS-13 is found in the different levels of performance required of incumbents of the two levels. As the above example indicates, systems development work at the GS-12 level is performed under close technical supervision and all work products are reviewed in detail for accuracy and adequacy of both the classification and technology aspects. This contrasts sharply with the substantially independent performance which is required of incumbents of the GS-13 level.

PATENT CLASSIFIER, GS-1223-13

Patent Classifiers, GS-13, typically perform both systems administration and systems development work, as follows:

SYSTEMS ADMINISTRATION RESPONSIBILITIES

Nature and complexity of assigned functions

Systems administration work at the GS-13 level involves a broad group of assigned patents. This group typically consists of several (e.g., 5-10) average-sized classes and normally involves two or more areas of technology. An example of an assignment meeting these criteria is as follows:

A typical assignment at this level involved the administration of the established classifications systems in the following classes:

- Metal Tools and Implements Making
- Gear Cutting, Milling and Planing
- Selective Cutting and Punching
- Typewriting Machines
- Work Holders
- Type Setting
- Electric Lamp and Discharge Devices, (Manufacture and Repair)

These seven classes of invention contain many thousands of patents involving (and requiring the patent classifier to be competent in) the areas of machine tool technology, the graphic arts, and electronic technology. (For the significance of extensiveness of assigned area and of variety of technology, see the GS-12 level, above.)

Level of performance

Within this broad assigned area, the Patent Classifier, GS-13, works with the same degree of authority and of independence as does the Patent Classifier, GS-12, in his much smaller assigned area. Also similar is the requirement that unusually difficult cases, cases needing policy determinations, and decisions involving classes other than those for which the incumbent has responsibility must be referred to higher authority for action or approval.

SYSTEMS DEVELOPMENT*Nature and complexity of assigned functions*

GS-13 is the full-performance level in systems development work. At this level, the patent classifier is typically assigned a portion of a major systems development project. This portion normally constitutes a substantial part of an entire average-sized class consisting of 9,000 to 10,000 patents, or other groups of patents of similar size. Over a period of time, the patent classifier typically performs such work in two or more related areas of technology.

An example of the typical extensiveness of assignments of this level occurred in the assignment involving the reclassification of a group of 2,000 to 3,000 patents forming a portion of the classes of Motor Vehicles and of Land Vehicles (Wheel Substitutes). It was the patent classifier's responsibility to develop a classification system which would cover all patents found in these two areas within the major reclassification project, and which would cover them in a manner that would best facilitate searching and examining activities.

Working with substantial independence from technical supervision, the classifier developed and prepared the detailed definitions, classification notes and guidelines, and other materials necessary to spell out and implement the new system. Upon approval by his supervisor, these became part of the overall system governing this area of invention.

(As indicated in the discussion of GS-12 systems development positions, the significance of the somewhat larger number of patents assigned at the GS-13 level is not as great as the broader technological knowledge required of GS-13 incumbents. Also, the GS-13 level is characterized by a much greater freedom from supervisory control than is the case at the GS-12 level.)

Level of performance

As the example indicates, a patent classifier at this level is expected to perform his assigned systems development tasks with little supervision. Exceptionally difficult technical and classification problems may be referred to the supervisor for his guidance and assistance. The basic concepts upon which the patent classifier proposes to base his intended work product are reviewed by the supervisor for their consistency with other portions of the overall classification system and with the work of other systems developers, as well as for their conformance to instructions and to accepted patent classification principles. But in his day-to-day operations, the Patent Classifier, GS-13, is expected to perform his assigned tasks independently, without the close technical supervision given to the work of GS-12 incumbents.

PATENT CLASSIFIER, GS-1223-14

Nature and complexity of assigned functions

The Patent Classifier, GS-14, typically is assigned to a major systems development project (i.e., one which is extensiveness and complexity is equivalent to a class containing 10,000 to 20,000 patents). The patent classifier has full and complete responsibility for the technical and classification adequacy and accuracy of all phases of the project, from initial fact-finding to final installation of the resulting system. Over a period of time, the incumbent normally is assigned such projects in two or more areas of technology, involving two or more specialized subject-matter fields (e.g., chemical fields and electrical fields, electrical fields and mechanical fields, etc.).

As an example of assignments of this level, a patent classifier was assigned responsibility for all aspects of the systems development project dealing with "Fluid Sprinkling, Spraying and Diffusing." This assignment involved some 30,000 patents and cross-references. A large number of these were found in the Fluid Sprinkling class, but many related patents were known to exist in several other classes in other fields and areas of technology as well. Included among these were portions of the Fluid Handling, the Dispensing, the Coating, and the Aeronautics classes from the broad area of "Mechanical Fields"; certain electrostatic patents from the "Electrical Fields" area; and groups of patents from the Coating and Chemistry classes of the AChemical Fields area.

The patent classifier in charge of this project had complete responsibility for the development of the new classification system, and for all of the many explanatory materials, training sessions, and "selling" activities necessary to put the new system into operation.

The projects typical of the GS-14 are more difficult than those which are typical of the GS-13 level because:

- (a) GS-14 projects are of considerably greater size (averaging 10,000 to 20,000 patents) and thus require the development of more complex classification systems.

(b) GS-14 projects involve a much greater diversity of patents and of classes dealt with. A GS-13 patent classifier is typically assigned only a portion of a large class. In the above example, this might be only the sprinkling portion of the Fluid Sprinkling, Spraying and Diffusing class. Such an assignment would require the GS-13 incumbent to deal with only one or two of the other classes listed.

(c) GS-14 projects require knowledge of a broader range of classification systems and of areas of technology. GS-13 assignments cover a few related classes, generally involving several areas of technology within a specialized subject-matter field (e.g., sprinkling patents and the Fluid Handling class, within the "Mechanical Fields" area). A GS-14 project, on the other hand, usually involves several different classes and their classification systems, often from two or more specialized subject-matter fields (e.g., the Fluid Handling, Coating and Dispensing classes within the broad "Mechanical Fields" area, electrostatic patents from the "Electrical Fields" area, solvent patents from "Chemical Fields", etc.). Further, over a period of time, a GS-14 patent classifier will be assigned such projects in a wide range of different classes and areas of technology.

The example also illustrates the complicating effects of large numbers of patents. Every patent in the assigned group must be covered. Further, the given group must be broken down as finely and as many times as is necessary to serve the various purposes for which the patent classification system is used. Thus, the greater the number of patents with which a given project must deal, the more complex the resulting patent classification system must be. It would be relatively simple, for example, to reduce a group of 400 patents to units containing 20-50 patents each (a number which can be searched in a reasonable time). But to reduce 30,000 patents to units of such manageable size requires a tremendously elaborate system, involving thousands of interrelated patent characteristics.

The Patent Classifier, GS-14, is under only general administrative supervision; he is fully responsible for the technical accuracy and adequacy of all assigned projects. He must therefore have a complete command of the several areas of technology involved in his work. Without it, he could not possibly develop a classification system adequate to cover all the latest and most advanced developments and trends in these various fields.

Thus the Patent Classifier, GS-14, exceeds the GS-13 level both in the much greater number of patents for which he is responsible, and in the greater breadth and diversity of knowledge required by the several areas of technology which his work involves.

Level of performance

As the example indicates, the Patent Classifier, GS-14, works under general administrative supervision; he is fully responsible for the timeliness and for the technical accuracy and adequacy of all phases and all products of the complete systems development project which he is assigned.

The extensiveness and/or the time priorities of the systems development projects typical of this level are frequently such as to require assignment of a team of other classifiers and of the patent

examiners working in the area covered by the project. In such cases, the Patent Classifier, GS-14, serves as the technical team leader, giving technical guidance and supervision to the team members (who are usually of GS-13 level), assigning and reviewing their work, and coordinating their activities toward the complete end product. The primary identifying characteristic of the Patent Classifier, GS-14, however, is the nature of his continuing total project responsibility, rather than his occasional technical supervisory duties.