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1. This Specification provides for the exchange of U.S. patent documents in machine-readable form in a hardware-, software-, and layout-independent format. Such independence of the representation of the contents of a document from their intended uses is achieved by using

International Standard ISO 8879:1986, Information processing - Text and office systems -

Standard Generalized Markup Language (SGML), to define generic identifiers which are in turn used to mark the logical structure of each patent document. 2. This Specification defines generic identifiers or "tags" for marking the logical elements of a United States patent document. It also defines content models which indicate the logical relationships between the tags. Because not all rules governing the content can be expressed using SGML, this specification also provides guidance in the markup of text to comply with the specification and with long-established conventions concerning the data itself (what appears between the tags). 3. Markup in compliance with this Specification is independent of layout and formatting. Decisions regarding layout and formatting must be made at the time a document is presented for reading, either on a display screen or on paper. It is at the time of presentation that, for example, text that has been marked as a claim is rendered in an available font at a practical size. It is at the time of presentation that the size of the display page (screen or paper) is determined. Many such decisions which map the generic identifiers in a document to the capabilities of a particular physical display device (whether screen or paper) determine, for example, how many characters will fit on one line or how much text will fit on a display page. As a result, the document may not have exactly the same physical appearance when it is presented on different display devices. The collection of such decisions is commonly recorded in a style sheet that is associated with a particular rendering technology. This specification does not address issues concerned with mapping generic identifiers to a particular display device and contains no style sheets. 4. Documents which conform to this Specification have been marked up in conformance with:

International Standard ISO 8879:1986, Information Processing - Text and Office Systems - Standard Generalized Markup Language (SGML); the DTDs contained in Annexes B, C, and D. 5. The Grant Red Book (RB) DTD and the documents that conform to this Specification have been made compliant with the XML 1.0 specification, to the extent possible within SGML. The RB DTD contains tag minimization indicators that are not allowed in XML and it refers to external entities that are not necessarily XML compliant. In document instances, the syntax of empty elements does not comply with the XML specification. Neither the RB DTD nor document instances use Unicode as their character set at this time. 6. Documents which conform to this Specification use the reference concrete syntax defined in International Standard ISO 8879:1986, with the exception that tag names sometimes exceed eight characters in length. See also Annex A: SGML Declaration for U.S. Patent Documents. 7. The RB DTD (Annex B) is provided separately from the individual documents in the collection of documents to which it applies. Each document to which the RB DTD applies incorporates the DTD by reference. Reference to the RB DTD shall be made by use of its "public name" which will be registered with the appropriate international authority and is declared below in Annex B.

# Definitions

8. Markup is defined as text that is added to the content of a document and that describes the structure and other attributes of the document in a non-system-specific manner, independently of any processing that may be performed on it. Markup includes document type definitions (DTDs), entity references, and descriptive markup (tags). 9. A document type definition (DTD) formally defines: the names of all the logical elements that are allowed in documents of a particular type; how often each logical element may appear; the permissible logical contents for each logical element; attributes (parameters) that may be used with each logical element; the correct sequence of logical elements; the names of all external and pre-defined entities that may be referenced in a document; the hierarchical structure of a document; and the features of the SGML standard used. A DTD defines the vocabulary of the markup for which SGML defines the syntax. The complete set of tags that may be found in a particular document are listed and formally defined in its DTD. Each document in a large set of documents which share the same DTD, that is, documents which are of the same type, usually incorporates the DTD by reference. 10. An entity is content that is not part of the text stream in a document but which is incorporated into the text stream by reference to its name. In patent documents, for example, images are external entities. Entity references can also be used to code instances of characters not found in the 'declared' character set. 11. Tags define a document's logical structure by labeling elements of the document's content using the generic identifiers declared in the DTD. 12. In some cases, the use of an attribute or element or some other practice is “deprecated,” that is, frowned upon and actively discouraged, even though it would not be an error to do so. 13. The hierarchy of SGML tags used in this specification follows the structure of a United States patent document. The appropriate SGML tag describing a generic logical element indicates the level in the hierarchy. A generic logical element is a component of the text such as the entire document, a specific sub-document, a paragraph, a list, etc. Each generic logical element is described by a start tag and end tag. Hierarchical level Nested SGML tags (example)

Document <PATDOC> $ Abstract sub-document <SDOAB> $ $ Text Component (Paragraph) <PARA> $ $ $ Paragraph content <PTEXT> $ $ $ $ Text <PDAT> $ $ $ $ $ Characters (content) mouse-catching means $ $ $ $ End </PDAT> $ $ $ End </PTEXT> $ $ End </PARA> $ End </SDOAB> End </PATDOC> 14. International Standard ISO 8879:1986 defines an abstract syntax and a reference concrete syntax. The reference concrete syntax for SGML tags is as follows: Start End Tag Tag This is <PARA>text</PARA> that will appear as a separate paragraph...Where < is the opening delimiter for Start Tags (1 character) </ is the opening delimiter for End Tags (2 characters) > is the closing delimiter for both Start Tags and End Tags (1 character) para is the generic identifier of this particular tag, as defined in the DTD. A generic identifier is a name that identifies a generic logical element. The text between the start tag and the end tag is a specific instance of the generic logical element. Depending upon the generic identifier, attributes may be required. For an explanation of the relationship between reference concrete syntax and abstract syntax, see International Standard ISO 8879:1986.

# Character Sets

15. The data content of the majority of documents, including patents, consists of data characters. The data characters could be in any language consisting of many types of character ('character' is used in its broadest sense here to include graphical symbols). Although Grant Red Book applies to English-language documents only, patent specifications may contain many hundreds of characters not used in English. The character code sets used in Grant Red Book are specified at the start of RB DTD and represent the minimum required to accommodate U.S. patent documents.

# References

16. The following documents are relevant to or cited in this Specification: International Standard ISO 8879:1986, Information processing - Text and office systems - Standard Generalized Markup Language (SGML) Technical Report ISO/IEC/TR 9573:1988(E) Information processing - SGML support facilities - Techniques for using SGML International Standard ISO 639:1988, Code for the Representation of Names of Languages International Standard ISO 646:1991, Information Processing - ISO 7-bit coded character set for information interchange WIPO Standard ST.3, Two-Letter Code for Countries, Organizations etc. WIPO Standard ST.9, Recommendation Concerning Bibliographic Data On and Relating To Patent Documents

WIPO Standard ST.16, Standard Code for Identification of Different Kinds of Patent Documents

WIPO Standard ST.32, Recommendation for the Markup of Patent Documents Using SGML

(Standard Generalized Markup Language), Revision adopted by the PCIPI Executive Coordination Committee at its seventeenth session on November 24, 1995. 17. For additional information concerning SGML, the following publications may be of interest. There is now a considerable amount of literature on SGML, as well as many user groups. The list below is only a small selection. Association of American Publishers. Electronic Manuscript Series : Author's guide to electronic manuscript preparation and markup; Reference manual on electronic manuscript preparation and markup; Markup of mathematical formulas; Markup of tabular material. Dublin, Ohio: Electronic Publishing Special Interest Group (EPSIG), 1989.

Bryan, Martin. SGM: an author's guide to the Standard Generalized Markup Language (SGML). Wokingham: Addison-Wesley, 1988. ISBN 0201175355. Goldfarb, Charles F. The SGML handbook. Oxford: Oxford University Press, 1990. ISBN 0198537379. Maler, Eve, et al. Developing SGML DTDs : From text to model to markup. Prentice Hall, 1996. ISBN 01330098818. National Information Standards Organization. Electronic manuscript preparation and markup. NISO Press, 1995. ANSI/NISO/ISO 12083-1995 (Formerly Z39.59). ISBN

1880124203. Travis, Brian E., et al. The SGML implementation guide: A blueprint for SGML migration. Springer-Verlag, 1995. ISBN 3540577300. Turner, Ronald C., et al. README.1ST : SGML for writers and editors. Prentice Hall, 1996. ISBN 0134327179. Van Herwijnen, Eric. Practical SGML. 2nd.ed. Dordrecht : Kluwer Academic Publishers, 1994. ISBN 0792394348. Jelliffe, Rick. The XML & SGML cookbook : recipes for structured information. Prentice Hall,

1998. ISBN 0136142230. CALS site: http://www-cals.itsi.disa.mil/ James Clark’s site (developer of SGML parsers): http://www.jclark.com/ SGML Open site: http://www.sgmlopen.org/ The newsletter TAG site: http://tag.sgml.com/ Washington, DC, metro-area SGML user’s group: http://www.eccnet.com/sgmlug/ Working Group 3, responsible for XML and MathML: <http://www.w3.org/>

# Entries

18. The entries (numbered paragraphs) throughout this document conform to the following model. NNN. **<TAG>**: TAG name. Description of the tag, that is, what it means, in one or more sentences. Contents of the tag, that is, a verbal repetition of the content model, always one sentence (not present if the tag is declared EMPTY). Indication of whether an end tag is required or forbidden. Additional paragraphs, if present, describe additional rules, conventions, or requirements that are not expressed in the SGML. Attributes: Attribute name Text describing the attribute and the values it might have. Content model: Content model verbatim from the RB DTD. Examples. 19. If it should happen that the verbal description of the content model, the content model as presented in this specification, and the content model in the RB DTD, do not all agree, then the content model in the corresponding version of the RB DTD should be followed.

# Data Delivery

20. Grant Red Book patents are delivered on DLT magnetic tape on a weekly schedule. Each tape is organized in the manner specified in Annex E. To order a sample tape or a subscription, please contact the Office for Patent & Trademark Information at the following address. USPTO/IDO/OPTI, Crystal Park 3, Suite 441, Washington, DC 20231, 1-703-306-2600 (voice),

1-703-306-2737 (telefax).

# Revision History

21. This specification is adapted from WIPO Standard ST.32. The changes made were those required to limit the more global scope of ST.32 specifically to published United States patent grants. Ultimately, this specification will be submitted to WIPO for inclusion as an Annex to ST.32 representing current practice at the U.S. Patent & Trademark Office. 22. The publication number of this specification corresponds to the version of the Grant Red Book DTD that it documents. 23. Version history. The first public version of this specification was v1.8/0, dated 1999 November 16. Version 1.8, dated 2000 January 20, corrected the content model for FGREF and the formatting of the tables on page 63. Version 1.9, dated 2000 March 7, includes modifications to allow for any order of structured or unstructured national classification, to allow text based formula content (as opposed to MATHML) within CWUs, and to expand paragraph type definitions. 24. The most obvious fault of v1.9/0 is that there are no examples present in the specification. This will be remedied in a future revision. Until then, readers are invited to examine sample Grant Red Book documents from the 2000 March 28 issue available for download from http://www.uspto.gov/web/offices/ac/ido/oeip/index.html. 25. Version 1.9 is open for comment until further notice. Comments collected will be consolidated, considered, and accepted or rejected. The accepted revisions will be incorporated in the next version of the document. 26. Please forward any comments about this specification to: Bruce B. Cox, Office for Patent & Trademark Information, U.S. Patent & Trademark Office, Crystal Park 3, Suite 441,

Washington, DC 20231, bruce.cox@uspto.gov, 1-703-306-2606.

# Part 1: SGML Markup for Common Text

General Text Tags.

Tag: BOLD, Name: Bold, Description: Bold; Tag: BRFSUM, Name: BRieF SUMmary, Description: Brief summary of the invention; Tag: BTEXT, Name: Body TEXT, Description: Body of the various components of SDOD; Tag: CHEM-US, Name: Chemistry, Description: Chemical entities of all types; Tag: CHEMCDX, Name: CDX file, Description: External file with a chemical entity in CDX format; Tag: CHEMMOL, Name: MOL file, Description: External file with a chemical entity in MOL format; Tag: CRF, Name: Chemical ReFerence, Description: Reference to a chemical expression; Tag: CUSTOM CHARACTER, Name: Custom character, Description: Entity reference to a character bitmap; Tag: CWU, Name: Complex Work Unit, Description: Complex work unit (math expressions, chemical expressions, tables, sequence listings); Tag: DATE, Name: DATE, Description: Date; Tag: DEL-E, Name: DELete End, Description: End of deleted text; Tag: DEL-S, Name: DELete Start, Description: Start of deleted text; Tag: DETDESC, Name: DETailed DESCription, Description: Detailed description of the invention; Tag: DFREF, Name: Display Formula REFerence, Description: Reference to a mathematical expression; Tag: DRWDESC, Name: DRaWing DESCription, Description: Description of the drawings; Tag: DULINE, Name: DoUble underLINE, Description: Double underline; Tag: F, Name: Formula, Description: In-line formula; Tag: FOO, Name: FOOtnote, Description: Indicates a footnote; Tag: FOR, Name: Footnote Reference, Description: Indicates a reference to a previous footnote; Tag: GOVINT, Name: GOVernment INTerest, Description: Indicates a property interest is held by the U.S. Federal government; Tag: H, Name: Heading level, Description: Indicates a separate text portion that precedes text parts, for example, paragraphs; Tag: HIL, Name: HIghLighting, Description: Various types of emphasis; Tag: IMG, Name: IMaGe, Description: Embedded images; Tag: INS-E, Name: INSert End, Description: End of inserted text; Tag: INS-S, Name: INSert Start, Description: Start of inserted text; Tag: ITALIC, Name: Italic, Description: Italic; Tag: LTL, Name: LiTeraL, Description: Indicates the beginning of text in which the space, indents, line endings, etc., should be preserved as keyed in the original document; Tag: MATH-US, Name: MATHematics, Description: Displayed and in-line math formulae; Tag: MATHEMATICA , Name: Mathematica, Description: External file with a math formula in Mathematica format; Tag: MATHML, Name: MathML, Tag: SGML-compliant MathML markup for a math formula; Name: PARA, Tag: PARagraph, Description: Indicates a text portion known as a paragraph and implies that the text will begin on a new line; Tag: PAREF, Name: PARagraph REFerence, Description: Indicates a reference to a particular paragraph by its paragraph number; Tag: PATDOC, Name: PATentDOCument, Description: A patent specification document instance; Tag: PDAT, Name: PcDATa, Description: Parsable character data, with DEL and INS. Terminal content model for all branches of the DTD tree.; Tag: PTEXT, Name: Paragraph TEXT, Description: Contents of a paragraph; Tag: RELAPP, Name: RELated APPlications, Description: Other patent relations; Tag: SB, Name: SuBscript, Description: Indicates text which is to be placed as a subscript to the preceding text, outside mathematical formulae; Tag: SDOAB, Name: Sub-Document ABstract, Description: Indicates the abstract; Tag: SDOBI, Name: Sub-Document Bibliography, Description: Indicates the bibliographic information contained on the first page; Tag: SDOCL, Name: Sub-Document Claims, Description: Indicates the claims; Tag: SDOCR, Name: Sub Document OCR, Description: Indicates text captured using OCR processing; Tag: SDODE, Name: Sub-Document Description, Description: Indicates the description of the invention; Tag: SDODR, Name: Sub-Document Drawings, Description: Indicates the drawings, if any; Tag: SEQ-EMBD, Name: None, Description: Sequence listing embedded in other text; Tag: SEQ-LST, Name: None, Description: A sequence listing; Tag: SEQLST-US, Name: None, Description: A sequence listing and its image; Tag: SEQREF, Name: None, Description: Reference to a sequence listing; Tag: SMALLCAPS, Name: Small Caps, Tag: Small capital letters; SP, Name: SuPerscript; Description: Indicates text which is to be placed as a superscript to the preceding text, outside mathematical formulae; Tag: STEXT, Name: None, Description: Text including limited special formatting or CWUs; Tag: TABLE-CALS, Name: None, Description: Table in CALS markup; Tag: TABLE-US, Name: None; Description: Table; Tag: TBLREF, Name: None, Description: Reference to a table by its ID; Tag: ULINE, Name: UnderLINE, Description: Underline; 27.<BOLD>: Bold. An enlargement of the strokes in the glyphs of a font. Contains any number of either parsable character data, custom characters, or revision markers; or, highlighting. An end tag is required. Used to replicate equivalent emphasis of text in the file wrapper. Attribute(s): None Content model: <!ELEMENT BOLD - - (PDAT | HIL)\* > Example

28. <BRFSUM>: BRieF SUMmary. Brief summary of the invention. Contains body text, that is, one or more headers, paragraphs, complex work units, or images. An end tag is required. Attribute(s): None Content model: <!ELEMENT BRFSUM - - (BTEXT) >Example. 29. **<**BTEXT>: Body TEXT. Structure for text used in the description and abstract. Contains one or more headers, paragraphs, complex work units, or images. An end tag is required. Attribute(s): None

Content model: <!ELEMENT BTEXT - - (H | PARA | CWU | IMG)+ >Example 30. <CHEM-US>: CHEMical expression (U.S. only). Structure for chemical entities. Contains three representations of the same entity, as a ChemDraw-proprietary CDX file, as a MOL file, and as an image file. An end tag is required. Attribute: ID = “CHEM-US-nnnn” Sequence number within the document. Chemical entities are numbered separately from other numbered series within the document. Content model: <!ELEMENT CHEM-US - - (CHEMCDX,CHEMMOL,EMI\*) > <!ATTLIST CHEM-US ID ID #REQUIRED > Example. 31. <CHEMCDX>: CHEMical CDX file. A chemical entity encoded using the proprietary CDX file structure published by Chem Draw. An end tag is forbidden. Attribute: ID = “CHEMCDX-nnnn” Sequence number within the document. CHEMCDX entities are numbered separately from other numbered series within the document.

FILE = “name” System-independent file name. See Annex E for file-naming conventions. Content model: <!ELEMENT CHEMCDX - O EMPTY ><!ATTLIST CHEMCDX ID ID #REQUIRED FILE ENTITY #REQUIRED > Example. 32. <CHEMMOL>: CHEMical MOL file.

A chemical entity encoded using the MOL file structure. An end tag is forbidden. Attribute: ID = “CHEMMOL-nnnn” Sequence number within the document. CHEMMOL entities are numbered separately from other numbered series within the document. FILE = “name” System-independent file name. See Annex E for file-naming conventions. Content model: <!ELEMENT CHEMMOL - O EMPTY ><!ATTLIST CHEMMOL ID ID #REQUIRED FILE ENTITY #REQUIRED > Example 33.<CRF>: Chemical ReFerence. Reference to a chemical expression. An end tag is forbidden. Attribute: ID = “CHEMMOL-nnnn” Sequence number within the document. CHEMMOL entities are numbered separately from other numbered series within the document. FILE = “name” System-independent file name. See Annex E for file-naming conventions. Content model: <!ELEMENT CRF - O EMPTY > <!ATTLIST CRF ID IDREFS #REQUIRED > Example. 34. <CUSTOM-CHARACTER>: Custom character. Reference to an entity file for a single character not found in any standard character set declared in the DTD. An end tag is forbidden. Refers to a bitmap image of the character that is presented in place of a standard glyph. Attributes: ID = “CCHAR-nnnn” Sequence number within the document. Custom-character entity references are numbered separately from other numbered series in the document. HE = nnn Height: 3-digit expression in millimeters. WI = nnn Width: 3-digit expression in millimeters. FILE = “name” System-independent file name. See Annex E for file-naming conventions. LX = nnnn 4-digit X-coordinate expressed in 1/10 millimeters of embedded image location referencing to the top left corner of the page. LY = nnnn 4-digit Y-coordinate expressed in 1/10 millimeters of embedded image location referencing to the top left corner of the page. Content model: <!ELEMENT CUSTOM-CHARACTER - O EMPTY > <!ATTLIST CUSTOM-CHARACTER LY NMTOKEN #IMPLIED LX NMTOKEN #IMPLIED FILE ENTITY #REQUIRED WI NMTOKEN #IMPLIED HE NMTOKEN #IMPLIED ID ID #REQUIRED > Example. 35. <CWU>: Complex Work Unit. A complex work unit is content which, because it requires exceptional processing for presentation, is delivered as a bitmap image, and because it represents technically significant content, is also delivered in an appropriate functional format. Contains a table, mathematical expression, chemical expression, sequence listing, or revision markers. An end tag is required. It is the intention of the U.S. PTO that this element will be used for all instances of the included content types, even if the content could have been expressed using other text markup. However, simple in-line formulas, such as E=MC2 or H2O, may be tagged using F. Attribute(s): None Content model: <!ELEMENT CWU - - (TABLE-US | MATH-US | CHEM-US | SEQLST-US | DEL-S | DEL-E | INS-S | INS-E) > Example. 36. <DATE>: DATE. Date. Contains parsable character data, custom characters, or revision markers. An end tag is required. Formatted as YYYYMMDD, that is, a four-digit year, two-digit month with leading zero, two-digit day with leading zero. Attribute(s): None. Content model: <!ELEMENT DATE - - (PDAT) > Example 37. <DEL-E>: DELete End. Marks the end of text which was deleted as the result of some action taken after issue. An end tag is forbidden. Must be paired with a DEL-S to which it refers. Attribute: ID = “DEL-S-nnnn” Sequence number within the document of the corresponding DEL-S tag. Content model: <!ELEMENT DEL-E - O EMPTY > <!ATTLIST DEL-E

ID IDREF #REQUIRED >Example. 38. <DEL-S>: DELete Start. Marks the start of text which was deleted as the result of some action taken after issue. An end tag is forbidden. Must be paired with a DEL-E which refers to it by its unique ID. Attributes: ID = “DEL-S-nnnn” Sequence number within the document. DEL-S tags are numbered separately from other numbered series in the document. DATE = “YYYYMMDD” Date the deletion was effective. YYYY = year, MM = month with leading zero, and DD = day with leading zero. Content models: <!ELEMENT DEL-S - O EMPTY > <!ATTLIST DEL-S ID ID #REQUIRED DATE NMTOKEN #IMPLIED >Example. 39. <DETDESC>: DETailed DESCription. The detailed description of the invention. Contains body text, that is, one or more headers, paragraphs, complex work units, or images. An end tag is required. Attributes: None Content model: <!ELEMENT DETDESC - - (BTEXT) >

Example. 40. <DFREF>: Display Formula REFerence. Reference to a mathematical expression. An end tag is forbidden. Attribute: ID = “MATH-US-nnnn” Sequence number within the document of the mathematical expression referred to. Math entities are numbered separately from other numbered series within the document. Content model: <!ELEMENT DFREF - O EMPTY ><!ATTLIST DFREF ID IDREFS #REQUIRED > Example. 41.<DRWDESC>: DRaWing DESCription. Description of the drawings, that is, the numbered figures. Contains body text, that is, one or more headers, paragraphs, complex work units, or images. An end tag is required. Attribute(s): none Content model: <!ELEMENT DRWDESC - - (BTEXT) > Example 42.<DULINE>: Double UnderLINE. A double score under text. Contains any number of either parsable character data, custom characters, or revision markers; or, highlighting. An end tag is required. Used to replicate equivalent emphasis of text in an application. Attribute(s): None

Content model: <!ELEMENT DULINE - - (PDAT | HIL)\* > Example 43.<F>: in-line Formula.

An in-line formula is one which is not set-off from the sentence within which it appears but is displayed in-line with the rest of the text in the sentence. Contains either MathML markup or paragraph text. An end tag is required. All mathematical expressions must be tagged as F or MATH-US. Attribute(s): None Content model: <!ELEMENT F - - (MATH|PTEXT) > Example 44. <FOO>: FOOtnotes. Text which is the contents of a footnote. Contains one or more of paragraph text, which see for an explanation. An end tag is required. The footnote must be inserted in the text stream at the point where it is first referred to. Attribute: ID = “FOO-nnnn” Sequence number within the document. Footnotes are numbered separately from other numbered series in the document. Content model: <!ELEMENT FOO - - (PTEXT+) > <!ATTLIST FOO ID ID #REQUIRED > Example 45. <FOR>: FOotnote Reference. Reference to a footnote. An end tag is forbidden. Attribute: ID = “FOO-nnnn” Sequence number within the document of the footnote referred to. Content model: <!ELEMENT FOR - O EMPTY > <!ATTLIST FOR

ID IDREF #REQUIRED > Example 46.<GOVINT>: GOVernment INTerest. Indicates that the U.S. Federal government has a property interest in the patent. Contains body text, that is, one or more headers, paragraphs, complex work units, or images. An end tag is required. Attribute(s): None Content model: <!ELEMENT GOVINT - - (BTEXT) > Example 47. <H>: Heading. Headings within the text. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Attributes: LVL = nn Integer indicating the hierarchical level of the heading, if any.

ALIGN = ”LEFT” Indicates the alignment of the header which may be center, left, right. Left is the default. Content model: <!ELEMENT H - - (STEXT)+ > <!ATTLIST H LVL NMTOKEN #IMPLIED ALIGN (CENTER | LEFT | RIGHT) "LEFT" > Example 48. <HIL>: HighLighting. Structure for various types of emphasized text. Contains any number of literal, subscript,

superscript, bold, italic, underline, double-underline, or small-caps. An end tag is required. Attribute(s): None Content model: <!ELEMENT HIL - - (LTL | SB | SP | BOLD | ITALIC | ULINE | DULINE | SMALLCAPS)\* > Example 49. <IMG>: ImaGe. Structure for various types of images. Contains one or more of: embedded image, reference to an image, image legend, text replaced by an image, or revision markers. An end tag is required. Attribute(s): None

Content model: <!ELEMENT IMG - - (EMI | EMR | ELE | RTI | DEL-S | DEL-E | INS-S | INS-E)+ >Example 50. <INS-E>: INSert End. Marks the end of text which was inserted as the result of some action taken after the patent issued. An end tag is forbidden. Must be paired with an INS-S to which it refers by the unique ID. Attributes: ID = “INS-S-nnnn” Sequence number within the document of the corresponding INS-S tag. Content model: <!ELEMENT INS-E - O EMPTY > <!ATTLIST INS-E ID IDREF #REQUIRED > Example 51. <INS-S>: INSert Start. Marks the start of text which was inserted as the result of some action taken after issue. An end tag is forbidden. Must be paired with an INS-E which refers to it by the unique ID. Attributes: ID = “INS-S-nnnn” Sequence number within the document. INS-S numbered separately from other numbered series in the document. DATE = “YYYYMMDD” Date the insertion or deletion was effective, that is, when the modified document was published. YYYY = year, MM = month with leading zero, and DD = day with leading zero. Content model: <!ELEMENT INS-S - O EMPTY > <!ATTLIST INS-S ID ID #REQUIRED DATE NMTOKEN #IMPLIED > Example 52.<ITALIC>: Italic. Tilting to the right of the vertical strokes in the glyphs of a font. Contains any number of either: parsable text, custom characters, and revision markers; or highlighting. An end tag is required. Used to replicate equivalent emphasis of text found in the file wrapper. Attribute(s): None Content model: <!ELEMENT ITALIC - - (PDAT | HIL)\* > Example 53. <LTL>: LiTeraL text

Text in which the space, indent, line ending, etc., should be preserved as keyed. Contains

parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT LTL - - (PDAT) > Example This textas a special

Layout which must be preserved exactly as entered. <LTL><PDAT> This text has a special layout which must be preserved exactly as entered. </PDAT></LTL> 54. <MATH-US>: MATHematics (U.S. only). Structure for mathematical entities. Contains three representations of the same entity, as a Mathematica file, markup using MathML (modified to be SGML compliant), and as one or more image files. An end tag is required. All mathematical expressions must be tagged as F or MATH-US. Attribute: ID = “MATH-US-nnnn” Sequence number within the document. Math entities are numbered separately from other numbered series within the document. Content model: <!ELEMENT MATH-US - - (MATHEMATICA,MATHML,EMI\*) >

<!ATTLIST MATH-US ID ID #REQUIRED > Example 55. **<MATHEMATICA>** : MATHEMATICA file. A mathematics entity encoded using the proprietary file structure for the Mathematica software product published by Wolfram Research. An end tag is forbidden. Refers to a binary file which requires proprietary software to read. Attribute: ID = “MATHEMATICA-nnnn” Sequence number within the document. Mathematica entities are numbered separately from other numbered series within the document. FILE = “Content model: <!ELEMENT MATHEMATICA - O EMPTY > <!ATTLIST MATHEMATICA ID ID #REQUIRED FILE ENTITY #REQUIRED > Example 56. <MATHML>: MathML markup. A mathematical expression encoded using the XML markup for mathematics, MathML. Contains one or more mathematical expressions. An end tag is required. The MathML DTD used with Grant Red Book has been modified only to the extent necessary for compliance with SGML. See Annex C. Attribute(s): None Content model: <!ELEMENT MATHML - - (MATH+) > Example 57. <PARA>: Paragraph.

Indicates a grammatical unit commonly known as a paragraph. An end tag is required. This tag is used to encode a linguistic feature as opposed to some arbitrary text which happens to be bounded by the same landmarks (CR-LF) as a paragraph. Attribute: ID = “PARA-nnnn” Sequence number within the document. Paragraphs are numbered separately from other numbered series in the document. LVL = n Integer indicating paragraph level. Do not use paragraph level to encode lists or claims. Used by data-capture contractor to encode paragraph type that in turn drives the layout engine. Content model: <!ELEMENT PARA - - (PTEXT+) > <!ATTLIST PARA ID ID #IMPLIED LVL (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7) #IMPLIED >

Example 58. <PAREF>: PAragraph REFerence. Reference to a grammatical unit commonly known as a paragraph. An end tag is forbidden. Attribute: ID = “PARA-nnnn” Sequence number within the document. Paragraphs are numbered separately from other series within the document. Content model: <!ELEMENT PAREF - O EMPTY > <!ATTLIST PAREF ID IDREF #IMPLIED > Example 59. <PATDOC>: PATent DOCument. Structure for a patent document. This is the root element of the document and contains within it all elements, content, and references to external entities, that constitute the document. Contains a bibliographic section (front page information), abstract, description, claim list, and possibly drawings and unstructured text from an OCR process. An end tag is required. An abstract is required for all types of U.S. patents except for design patents. Attributes: FILE = name Where ‘name’ is the name of the patent document file, which contains the document instance. STATUS = Status of the patent document, e.g. contains changes, republished, deleted, withdrawn, etc. CY = xx Where xx is the country or organization, according to WIPO ST.3, publishing or issuing the patent document. See also B190. DATE = YYYYMMDD Date of publication. See also B140. DNUM = n Where n is the document number, usually the publication number but may also be the application number. See also B110 and B210. KIND = xx Where xx is the kind of patent document code taken from WIPO ST.16. See also B130. DTD = n Where n is the version number of the DTD applied to a particular patent document. Content model: <!ELEMENT PATDOC - - (SDOBI,SDOAB?,SDODE,SDOCL,SDODR?,SDOCR?) > <!ATTLIST PATDOC CY CDATA #IMPLIED DNUM CDATA #IMPLIED DATE NMTOKEN #IMPLIED FILE CDATA #IMPLIED KIND CDATA #IMPLIED STATUS CDATA #IMPLIED DTD NMTOKEN #IMPLIED > Example 60.<PDAT>: PcDATa. Structure for text. Contains any number of parsable character data (data which it is nominally safe to parse without risk of misinterpretation), revision markers, or custom-character entity references. This element is the terminal leaf on nearly all branches of the element tree. Attribute(s): None Content model: <!ELEMENT PDAT - - (#PCDATA | DEL-S | DEL-E | INS-S | INS-E | CUSTOM-CHARACTER)\* > Example 61.<PTEXT>: Paragraph TEXT.

Structure for the contents of a paragraph. Contains at least one of or any combination of microorganism deposit information, citation, claim reference, chemical structure reference, complex work unit, math reference, document number, in-line formula, figure reference, footnote, footnote reference, highlighting, image, list, list reference, paragraph reference, character data, sequence listing reference, or a table reference. An end tag is required. Attribute(s): None Content model: <!ELEMENT PTEXT - - (B830 | CIT | CLREF | CRF | CWU | DFREF | DNUM | F |FGREF | FOO | FOR | HIL | IMG | LST | LSTREF | PAREF | PDAT | SEQREF | TBLREF)+ > Example 62.<RELAPP>: RELated APPlication(s). A description of related applications and their relevance to this document. Contains body text, that is, one or more headers, paragraphs, complex work units, or images. An end tag is required. Attribute(s): None Content model: <!ELEMENT RELAPP - - (BTEXT) > Example 63. <SB>: SuBscript. Text to be placed as a subscript (inferior) to the immediately preceding character. Contains any

number of either parsable character data, custom characters, or revision markers; or, highlighting. An end tag is required. Not to be used for mathematical formulas or chemical structures which must use F, MATH-US, or CHEM-US tags. Attribute(s): None Content model:

<!ELEMENT SB - - (PDAT | HIL)\* > Example 64. **<SDOAB>** : Sub-DOcument Abstract. Structure for the abstract of the patent. Contains body text, that is, one or more headers, paragraphs, complex work units, or images. An end tag is required. Attributes:

CY = “US” Indicates the country that the sub-document relates to, abbreviated in accordance with WIPO Standard ST.3 country codes. LA = “EN” Indicates language of the sub-document in accordance with International Standard ISO 639:1988. STATUS = Status of the patent sub-document, e.g. contains changes, republished, deleted, withdrawn, etc. Use of this attribute is deprecated. Content model: <!ELEMENT SDOAB - - (BTEXT) > <!ATTLIST SDOAB LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > Example 65. <SDOBI>: Sub-DOcument BIbliographic information. Structure for the bibliographic information included on the front page of a patent. Contains document identification, domestic filing data, foreign priority data (optional), public availability dates or term of protection (optional), technical information, related patent or application information (optional), parties concerned with the document, and data related to international conventions (optional). An end tag is required.

Attributes: CY = “US” Indicates the country that the sub-document relates to, abbreviated in accordance with WIPO Standard ST.3 country code. LA = “EN” Indicates language of the sub-document in accordance with International Standard ISO 639:1988. STATUS = Status of the patent sub-document, e.g. contains changes, republished, deleted, withdrawn, etc. Content model: <!ELEMENT SDOBI - - (B100,B200,B300\*,B400?,B500,B600?,B700,B800?) > <!ATTLIST SDOBI LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > Example 66. <SDOCL>: Sub-DOcument CLaims. Structure for the claims of the patent. Contains an optional header and a required list of claims. An end tag is required. Attributes: CY = “US” Indicates the country that the sub-document relates to, abbreviated in accordance with WIPO Standard ST.3 country code. LA = “EN” Indicates language of the sub-document in accordance with International Standard ISO 639:1988. STATUS = Status of the patent sub-document, e.g. contains changes, republished, deleted, withdrawn, etc. Content model: <!ELEMENT SDOCL - - (H?,CL) > <!ATTLIST SDOCL LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > Example 67. <SDOCR>: Sub-DOcument OCR. OCR (optical character recognition) of unstructured bibliographic legacy text information. Contains parsable character data, custom characters, or revision markers. An end tag is required. Where OCR processing fails to populate all first-page elements, the entire first-page text is included in this element. Appears only in those U.S. documents which have been captured using OCR processing. Attributes: CY = “US” Indicates the country that the sub-document relates to, abbreviated in accordance with WIPO Standard ST.3 country code. LA = “EN” Indicates language of the sub-document in accordance with International Standard ISO 639:1988. STATUS = Status of the patent sub-document, e.g. contains changes, republished, deleted, withdrawn, etc. Content model: <!ELEMENT SDOCR - - (PDAT) > <!ATTLIST SDOCR LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > Example 68. <SDODE>: Sub-DOcument DEscription. Structure for the description of the invention. Contains related application information (optional), government interest information (optional), a brief summary (optional), a description of drawings (required if drawings are present), and the detailed description of the invention (required for all patent types except Plant Patents). An end tag is required. Attributes: CY = “US” Indicates the country where the sub-document relates to, abbreviated in accordance with WIPO Standard ST.3 country code. LA = “EN” Indicates language of the sub-document in accordance with International Standard ISO 639:1988. STATUS = Status of the patent sub-document, e.g. contains changes, republished, deleted, withdrawn, etc. Content model: <!ELEMENT SDODE - - (RELAPP?,GOVINT?,BRFSUM?,DRWDESC?,DETDESC?) > <!ATTLIST SDODE LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > Example 69. <SDODR>: Sub-DOcument DRawings. Structure for the drawings associated with the patent. Contains any number of images and revision markers. An end tag is required. Attributes:

CY = “US” Indicates the country that the sub-document relates to, abbreviated in accordance with WIPO Standard ST.3 country code. LA = “EN” Indicates language of the sub-document in accordance with International Standard ISO 639:1988. STATUS = Status of the patent sub-document, e.g. contains changes, republished, deleted, withdrawn, etc. Content model: <!ELEMENT SDODR - - (EMI | DEL-S | DEL-E | INS-S | INS-E)\* > <!ATTLIST SDODR LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > Example 70. <SEQ-EMBD>: SEQuence EMBeDded. Sequence listing embedded in other text. Contains parsable character data, custom characters, or revision markers. An end tag is required.

Attribute(s): None Content model: <!ELEMENT SEQ-EMBD - - (PDAT) > Example 71. <SEQ-LST>: SEQuence LiSTing. Structure for a gene sequence listing. Contains the number of sequences in the listing, information about the computer-readable form in which the sequence was submitted (optional), and at least one set of detailed information about the sequence. An end tag is required. See table of S tags below. Attribute(s): None Content model: <!ELEMENT SEQ-LST - - (S160,S-1-V?,S200+) > Example 72. <SEQLST-US>: SEQuence LiST (U.S. only).

Structure for sequence listing entities. Contains either a sequence list and any number of images thereof, or an embedded sequence and any number of images thereof. An end tag is required. Attribute: ID = “SEQLST-US-nnnn” Sequence number within the document. Sequence listings are numbered separately from other numbered series in the document. Content model: <!ELEMENT SEQLST-US - - ((SEQ-LST,EMI\*) | (SEQ-EMBD,EMI\*)) > <!ATTLIST SEQLST-US ID ID #REQUIRED > Example 73. <SEQREF>: SEQuence REFerence Reference to a sequence listing. An end tag is forbidden. Attribute(s): None ID = “SEQLST-US-nnnn” Sequence number within the document of the sequence list referred to. Content model: <!ELEMENT SEQREF - O EMPTY > <!ATTLIST SEQREF ID IDREF #REQUIRED > Example 74.<SMALLCAPS>: Small capitals. Small capital letters. Contains any number of either parsable character data, custom characters, or revision markers; or, highlighting. An end tag is required. Used to replicate equivalent emphasis of text in the file wrapper. Attribute(s): None

Content model: <!ELEMENT SMALLCAPS - - (PDAT | HIL)\* > Example 75. <SP>: SuPerscript.

Indicates text to be placed as a superscript (superior) to the immediately preceding character.

Contains any number of either parsable character data, custom characters, or revision markers; or, highlighting. An end tag is required. Not to be used for mathematical formulas or chemical structures which must use MATH-US or CHEM-US tags. Attribute(s): None Content model: <!ELEMENT SP - - (PDAT | HIL)\* > Example 76. <STEXT>: Simple TEXT. Text where only limited special formatting is allowed. Contains one or more of: parsable character data, custom characters, or revision markers; or an in-line formula; or a footnote reference; or an image; or highlighting. An end tag is required. Attribute(s): None Content model: <!ELEMENT STEXT - - (PDAT | F | FOR | IMG | HIL)+ > Example 77. <TABLE-CALS>: TABLE - CALS markup.

CALS markup for a table. Contains table markup based on the CALS specification, for details of which see the CALS DTD in Annex D. An end tag is required. Attribute(s): None Content model: <!ELEMENT TABLE-CALS - - (TABLE) > Example 78. <TABLE-US>: TABLE (U.S. only).

Structure for tables. Contains CALS table markup and any number of optional images of the table. An end tag is required. Attribute(s): None Content model: <!ELEMENT TABLE-US - -(TABLE-CALS,EMI\*) > <!ATTLIST TABLE-US ID ID #REQUIRED > Example 79. <TBLREF>: TaBLe REFerence. Reference to a table by its ID. An end tag is forbidden. Attribute(s): None Content model: <!ELEMENT TBLREF - O EMPTY > <!ATTLIST TBLREF ID IDREFS #IMPLIED>Example 80.<ULINE>: UnderLINE. Single score under text. Contains any number of either parsable character data, custom characters, or revision markers; or, highlighting. An end tag is required. Used to replicate equivalent emphasis of text in the file wrapper. Attribute(s): None Content model: <!ELEMENT ULINE - - (PDAT | HIL)\* > Example

## Lists

List Tags. Tag: CL, Name: Claim List, Description: List of claims; Tag: CLM, Name: CLaiM, Description: A claim; Tag: CLMSTEP, Name: ClaiM STEP, Description: A logical step or element of a claim; Tag: CLREF, Name: Claim REFerence, Description: Reference to a claim by its ID; Tag: DD, Name: Definition Description, Description: The definition of an item in a definition list; Tag: DL, Name: Definition List, Description: Indicates a text portion to be displayed as a list, each item comprising a term followed by a description; Tag: DT, Name: Definition Term, Description: The term in a definition list; Tag: LI, Name: List Item, Description: An item which forms part of a simple, ordered or unordered list; Tag: LST, Name: LiST, Description: Lists of all types; Tag: LSTREF, Name: LiST REFerence, Description: Reference to a list by its list number, Tag: OL, Name: Ordered List, Description: Each item in this type of list is identified by a sequential number or letter; Tag: SL, Name: Simple List, Description: Indicates a text portion to be displayed as a simple list (no bullets or numbers); Tag: UL, Name: Unordered List, Description: Each item in the list marked by a bullet which is defined in an attribute. 81. <CL>: CLaim List Structure for an ordered list of claims. Contains one or more claims. An end tag is required. Attribute(s): None Content model: <!ELEMENT CL - - (CLM+) > Example 82. <CLM>: ClaiM. Structure for a singular claim. Contains one or more of text, paragraph, or claim step. An end tag is required. Each claim must consist of a single sentence. Attribute: ID = “CLM-nnnn” Sequence number within the document. Claims are numbered separately from other numbered series in the document. Content model: <!ELEMENT CLM - - (PTEXT | PARA | CMLSTEP)+ > <!ATTLIST CLM ID ID #REQUIRED > Example 83.<CLMSTEP> : CLaiM STEP.

A logical step or element of a claim. Contains one or more of text or paragraphs. An end tag is

required. A claim step is always a fragment of the sentence that constitutes the claim.

Attribute: LVL = “n” Integer indicating step level. Used to encode the hierarchy of the steps in a single claim. Content model: <!ELEMENT CLMSTEP - - (PTEXT | PARA)+ > <!ATTLIST CLMSTEP LVL (0 | 1 | 2 | 3 | 4 | 5) #IMPLIED > Example 84. <CLREF>: CLaim REFerence

Reference to a claim. An end tag is forbidden. Attribute: ID = “CLM-nnnn” Sequence number within the document of the claim referred to. Content model: <!ELEMENT CLREF - O EMPTY > <!ATTLIST CLREF ID IDREF #REQUIRED > Example 85. <DD>: Definition Description

Description (definition) of an item (term) in a definition list. Contains one or more of text or paragraphs. An end tag is required. Attribute(s): None Content model: <!ELEMENT DD - - (PTEXT | PARA)+ > Example 86. <DL>: Definition List Structure for a definition or glossary list, consisting of one or more items, each followed by its description. Contains one or more pairs of an item and it description. An end tag is required. Attributes: TSIZE = Specifies the indent to be used for the definition description. Use of this attribute is deprecated. COMPACT = Indicates when blank lines are to be inserted between definition items at the time of presentation. Use of this attribute is deprecated. Content model: <!ELEMENT DL - - (DT,DD)+ > <!ATTLIST DL

TSIZE NMTOKEN #IMPLIED COMPACT (COMPACT) #IMPLIED > Example 87. <DT>: Definition Term A term (item) in a definition list. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. No end tag is necessary. Attribute(s): None Content model: <!ELEMENT DT - - (STEXT+) > Example 88. **<LI>** : List Item. An item which forms part of a simple, ordered, or unordered list. Contains one or more of paragraph text or a paragraph. An end tag is required. Attribute(s): None Content model: <!ELEMENT LI - - (PTEXT | PARA)+ > Example 89. <LST>: LiST Structure for lists of all types. Contains exactly one of: a list of definitions, an ordered list (numbered or bulleted items), a simple list, or an unordered list. An end tag is required.

Attribute: ID = “LST-nnnn” Sequence number within the document. Lists (all types) are numbered separately from other numbered series in the document. Content model: <!ELEMENT LST - - (DL | OL | SL | UL) > <!ATTLIST LST ID ID #REQUIRED > Example 90.<LSTREF>: LiST REFerence Reference to a list. An end tag is forbidden. Attribute:

ID = “LST-nnnn” Sequence number within the document of the list referred to. Content model: <!ELEMENT LSTREF - O EMPTY > <!ATTLIST LSTREF ID IDREF #REQUIRED > Example 91. <OL>: Ordered List. In an ordered list, each item has a number or letter associated with it and the items are presented in the order of the numbers or letters. Contains one or more list items. An end tag is required. The numbers or letters associated with each list item must be generated at the time the document is created, not at the time of presentation. Such numbers or letters must be encoded as content, even if coded as attributes. Lists may be nested. Attributes: COMPACT = Used to indicate when no blank lines are to be left between items at the time of presentation. Use of this attribute is deprecated. LEVEL = Used to indicate the nesting level of a list. NUMSTYLE = Used to indicate the numeric style of a list. PREFIX = Used to indicate prefix for each list item. Content model: <!ELEMENT OL - - (LI+) > <!ATTLIST OL COMPACT (COMPACT) #IMPLIED LEVEL NMTOKEN #IMPLIED PREFIX CDATA #IMPLIED NUMSTYLE CDATA #IMPLIED > Example 92. <SL>: Simple List A simple list has nothing preceding the list items (number or bullets, etc.) to mark them as such. Contains one or more list items. An end tag is required. Lists may be nested. Attributes: COMPACT = Used to indicate when no blank lines are to be left between items at the time of presentation. Use of this attribute is deprecated.

LEVEL = Used to indicate the nesting level of a list. Content model: <!ELEMENT SL - - (LI+) > <!ATTLIST SL COMPACT (COMPACT) #IMPLIED LEVEL NMTOKEN #IMPLIED > Example 93. <UL>: Unordered List. An unordered list is a list wherein the items are marked with bullets to mark each item. Contains one or more list items. An end tag is required. Attributes: ST = This attribute is followed by an identifier for the bullet (character or graphic symbol) used to mark each item in the list. COMPACT = Used to indicate when no blank lines are to be left between items at the time of presentation. Use of this attribute is deprecated. LEVEL = Used to indicate the nesting level of a list. Content model: <!ELEMENT UL - - (LI+) > <!ATTLIST UL ST CDATA #REQUIRED LEVEL NMTOKEN #IMPLIED COMPACT (COMPACT) #IMPLIED > Example

## Images

Image Tags. Tag: ELE, Name: Embedded image Legend, Description: Indicates a portion of text directly related to an embedded image; Tag: EMI, Name: EMbedded Image, Description: Indicates non character-coded data.; Tag: EMR, Name: Embedded image Reference, Description: Indicates a reference to a previous EMI; Tag: FGREF, Name: FiGure REFerence, Description: Reference to a figure (drawing) by its ID; Tag: RTI, Name: Replacement of Text by Image, Description: Indicates text that is also captured as an image. The image data may be used in place of the text in order to guarantee that presentation is identical to the original document. 94. <ELE>: Embedded image Legend Caption or other text associated with an embedded image. Contains parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Attribute: ID = “EMI-nnnn” Sequence number within the document of the image with which the text is associated. Optional Attribute(s): None Content model: <!ELEMENT ELE - - (STEXT) > <!ATTLIST ELE

ID IDREF #REQUIRED > Example 95. <EMI>: EMbedded Image. Any information which cannot be economically coded using SGML is captured and delivered as an image file. An end tag is forbidden. Attributes: ID = “EMI-nnnn” Sequence number within the document. Embedded images are numbered separately from other numbered series in the document. HE = nnn Height: 3-digit expression in millimeters. WI = nnn Width: 3-digit expression in millimeters. FILE = name Where 'name' is the name (with pointer if required) of the image file, which contains the embedded image. LX = nnnn 4-digit X-coordinate expressed in 1/10 millimeters of embedded image location referencing to the top left corner of the page. LY = nnnn 4-digit Y-coordinate expressed in 1/10 millimeters of embedded image location referencing to the top left corner of the page. IMF = “TIFF” Indicates the type of image file of the stored image. In U.S. patent documents, always TIFF. Possible formats and files include: ST33 WIPO ST.33 (default), CGM Computer Graphics Metafile, EPS Encapsulated Postscript, G3 CCITT Group 3 compression, G4 CCITT Group 4 compression, TIFF Tag Image File Format, IGES Initial Graphics Exchange Format, JPEG Joint Photographic Experts Group Format, MPEG Motion Picture Experts Group Format, GEM Digital Research GEM, AI Adobe Illustrator, GIF CompuServe Graphics Image Format, PCT Apple Picture File Format, BMP Microsoft Bitmap File Format, PCX Paintbrush File Format, WMF Windows Metafile Format, PGL Hewlett-Packard Graphics Language, WPG WordPerfect Graphics File format, etc., TI = Type of embedded Image. Possible type names include: AD Abstract Drawing, CF Chemical Formulae, CI Clipped Image, CP Computer Programs, DN DNa sequences, DR Drawings, FF undefined characters, FG FiGures, GR Graphs, MF Mathematical Formulae, PA Full PAge facsimile image, PH Photographs, SR Search Report forms, TB TaBular data, TX TeXt character(s) (deprecated in U.S. documents), UI Undefined Images (deprecated in U.S. documents), Content model: <!ELEMENT EMI - O EMPTY ><!ATTLIST EMI ID ID #REQUIRED HE NMTOKEN #IMPLIED WI NMTOKEN #IMPLIED FILE ENTITY #REQUIRED LX NMTOKEN #IMPLIED LY NMTOKEN #IMPLIED IMF (ST33 | TIFF) #IMPLIED TI (AD | CF | CI | CP | DN | DR | FG | FF | GR | MF | PA | PH | SR | TB | TX | UI) #IMPLIED > Example 96. <EMR>: EMbedded image Reference. Reference to an embedded image. An end tag is forbidden. Attribute: ID = “EMI-nnnn” Sequence number within the document of the image referred to. Content model: <!ELEMENT EMR - O EMPTY > <!ATTLIST EMR ID IDREF #REQUIRED > Example 97.<FGREF> : FiGure REFerence.

Reference to a figure (drawing) by its ID. An end tag is forbidden. Attribute: ID = “FIG-nnnn” Sequence number within the document of the figure referred to. Content model: <!ELEMENT FGREF - O EMPTY > <!ATTLIST FGREF ID IDREF #REQUIRED > Example 98. <RTI>: Replacement of Text by Image. Text that is not economic to code as SGML may also be captured as an image which is used in place of the text at rendering in order to guarantee that presentation is identical to the original document. Contains parsable character data, custom characters, or revision markers. An end tag is required. Both the text and the image intended to replace it are required. Attributes: ID = “RTI-nnnn” Sequence number within the document. RTI images are numbered separately from other numbered series in the document. HE = nnn Height: 3-digit expression in millimeters. WI = nnn Width: 3-digit expression in millimeters. FILE = “name” Where “name” is the name (with pointer if required) of the image file, which contains the RTI image. IMF = “TIFF” The type of image file of the stored image. Always TIFF for U.S. patent documents. See <EMI> for full list. LX = nnnn 4-digit X-coordinate expressed in 1/10 millimeters of embedded image location referencing to the top left corner of the page. LY = nnnn 4-digit Y-coordinate expressed in 1/10 millimeters of embedded image location referencing to the top left corner of the page. Content model: <!ELEMENT RTI - - (PDAT) > <!ATTLIST RTI ID ID #REQUIRED HE NMTOKEN #IMPLIED WI NMTOKEN #IMPLIED FILE ENTITY #REQUIRED LX NMTOKEN #IMPLIED LY NMTOKEN #IMPLIED IMF (ST33 | TIFF) #IMPLIED>Example

## Citations

Citation Tags. Element: CIT DOC, Content: See below, Description: Patent Document Citation - Cited document; Element: CIT B220, Content: See below, Description: Patent Document Citation – Application filing date; Element: CIT B140, Content: See below, Description: Patent Document Citation - Document date (publication or issue), Element: CIT NAM, Content: See below, Description: Patent Document Citation – Citation applicant or patentee; Element: CIT PIC, Content: PDAT, Description: Patent Document Citation – IPC of citation; Element: CIT PNC, Content: PDAT, Description: Patent Document Citation – National classification of citation; Element: CIT NCIT, Content: PDAT, Description: Patent Document Citation – Non-patent document citations; Element: CIT REL, Content: PDAT, Description: Patent Document Citation Relevant section or passage. 99. <CIT>: CITation. Citation of another document, either a patent or something else. Contains one or more citations, each of which contains either the cited document number, application filing date, publication or issue date, applicant or patentee identification, IPC, PC; or a non-patent citation; followed by any reference(s) to relevant section(s) or passage(s). An end tag is required. Attribute(s): None

Content model: <!ELEMENT CIT - - (((DOC,B220,B140,NAM\*,PIC\*,PNC\*) | NCIT),REL\*)+ >

Example 100. <NCIT>: Non-patent CITation. Citation of another document not a patent. Contains parsable character data, custom characters, or revision markers. An end tag is required. Citations are transcribed exactly as found in the file wrapper. Attribute(s): None Content model: <!ELEMENT NCIT - - (PDAT) > Example 101. <REL>: RELevant section.

Indication of the relevant section of the cited document, such as page numbers, paragraph numbers, relevant residues in a sequence listing, etc. Contains parsable character data, custom characters, or revision markers. An end tag is required. Transcribed exactly as found in the file wrapper. Attribute(s): None Content model: <!ELEMENT NCIT - - (PDAT) > Example

## Document Identification

Patent Document Identification Tags. DOC DNUM PDAT, Documentation Identification: Document number; DOC DATE PDAT, Document Identification: Document date; DOC CTRY PDAT, Documentation Identification: Publishing country or organization (ST.3); DOC KIND PDAT, Documentation Identification: Document kind (ST.16); DOC BNUM PDAT, Documentation Identification: Bulletin number; DOC DTXT STEXT, Documentation Identification: Descriptive text; PARENT-US DNUM PDAT, Describes parent document: Document number; PARENT-US CDOC DOC, Describes parent document: Child document; PARENT-US PDOC DOC, Describes parent document: Parent document; PARENT-US PSTA PDAT, Describes parent document: Parent application status; PARENT-US PPUB DOC, Describes parent document: Patent associated with parent document; SIBLING CDOC DOC, Divisional reissue siblings: Child document identification; SIBLING SDOC DOC, Divisional reissue siblings: Divisional reissue sibling application; SIBLING SPUB DOC, Divisional reissue siblings: Divisional reissue sibling parent. 102. <BNUM>: Bulletin NUMber. Number of the official gazette or equivalent publication in which the document was announced. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None. Content model: <!ELEMENT BNUM - - (PDAT) > 103. <CDOC>: Child DOCument. Identification of a child document, that is, a document which is derived in some way from another document. Contains one document identification. An end tag is required. Attribute(s): None. Content model: <!ELEMENT CDOC - - (DOC) > Example. 104. <CTRY>: CounTRY. WIPO Standard ST.3 code for the country. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT CTRY - - (PDAT) > Example 105. <DNUM>: Document NUMber. Identifying number of the document, whether it be a patent application or a published patent grant. Contains parsable character data, custom characters, or revision markers. An end tag is required. For PCT patent applications, the document number is 14 alphanumeric positions including slashes. For U.S. patent applications, the document number is a fixed length of eight digits. The first two digits are the series code and the following six digits are the serial number, left-padded with zeros. For U.S. patent grants, the document number is a fixed length of eight characters which has the following format: Patent Type Position Content, Design 1 Constant “D”, 2 – 8 7-digit numeric, right justified, with leading zeros, Design SIR 1 – 2 Constant “HD”, 3 – 8 6-digit numeric, right justified, with leading zeros, Plant SIR 1 – 2 Constant “HP”, 3 – 8 6-digit numeric, right justified, with leading zeros, Utility SIR 1 Constant “H”, 2 – 8 7-digit numeric, right justified, with leading zeros, Plant 1 – 2 Constant “PP”, 3 – 8 6-digit numeric, right justified, with leading zeros, Reissue 1 – 2 Constant “RE”, 3 – 8 6-digit numeric, right justified, with leading zeros. Utility (invention) - 1 – 8 8-digit numeric, right justified, with leading zeros. Reexamination certificate Reexamination certificates retain the document number of the original patent upon which they are based. See B130 below for further information about reexaminations. Attribute(s): None Content model: <!ELEMENT DNUM - - (PDAT) > Example 106. <DOC>: DOCument identification. Identification of a patent document. Contains document number, date of publication, issuing country using WIPO Standard ST.3 code, document kind using WIPO Standard ST.16 code, number of the bulletin or gazette in which the document was announced, and any additional descriptive text. An end tag is required. Attribute(s): None Content model: <!ELEMENT DOC - - (DNUM,DATE?,CTRY?,KIND?,BNUM?,DTXT\*) > Example 107. <DTXT>: Descriptive TeXT. Descriptive text. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. In DOC, DTXT content helps specify the document in question. In PARTY-US, DTXT content further describes the status of the individual. When PARTY-US refers to an inventor (B721), for example, DTXT may contain “deceased” or “administrator of the estate” when the actual inventor is unable to file the application. Attribute(s): None Content model: <!ELEMENT DTXT - - (STEXT\*) > Example 108. <KIND>: Kind. The document kind code taken from WIPO Standard ST.16, or the kind of document generally. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT KIND - - (PDAT) > Example 109. <PARENT-US>: PARENT (U.S. only). Identification of a pair of related patent documents, parent and child. Contains identification of the parent, the child, any previously published document, status of the parent application, and any patent grant associated with the parent. An end tag is required. Attribute(s): None Content model: <!ELEMENT PARENT-US - - (CDOC,PDOC,B650?,PSTA,PPUB?) > Example 110. <PDOC>: Parent DOCument. Identification of a parent document. Contains a document identification. An end tag is required. Attribute(s): None Content model: <!ELEMENT PDOC - - (DOC) > Example 111. <PIC>: Patent’s International Classification. International classification associated with the cited document. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT PIC - - (PDAT) > Example. 112. <PNC>: Patent’s National Classification. National or domestic classification associated with the cited document. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT PNC - - (PDAT) > Example 113. <PPUB>: Parent’s PUBlication. Identification of a patent which has issued from the parent application. Contains a document identification. An end tag is required. Attribute(s): None Content model: <!ELEMENT PPUB - - (DOC) > Example 114. <PSTA>: Parent’s STAtus. Status of the parent application. Contains parsable character data, custom characters, or revision markers. An end tag is required. Only the following parent status codes are permitted: 00 = pending, 01 = granted (issued as a patent), 03 = abandoned, 04 = statutory invention registration (SIR), Attribute(s): None, Content model: <!ELEMENT PSTA - - (PDAT) > Example. 115. <SDOC> : Divisional reissue sibling application. Divisional reissue sibling application. Contains a document identifier. An end tag is required. Attribute(s): None Content model: <!ELEMENT SDOC - - (DOC) > Example 116. <SIBLING>: SIBLING document. Identification of a pair of related patent documents, a child and its sibling. Contains the child, the divisional reissue sibling application, and the divisional reissue sibling patent. An end tag is required. Attribute(s): None Content model: <!ELEMENT SIBLING - - (CDOC,SDOC,SPUB) > Example 117. <SPUB>: Divisional reissue sibling. A divisional reissue sibling patent. Contains a document identifier. An end tag is required.. Attribute(s): None Content model: <!ELEMENT SPUB - - (DOC) > Example.

## NAME AND ADDRESS

PARTY-US NAM TTL PDAT, Individual or Organization Data: Title; PARTY-US NAM FNM PDAT, Individual or Organization Data: Given, middle name(s) and/or Initials; PARTY-US NAM SNM PDAT, Individual or Organization Data: Family name, last, surname, organization name; PARTY-US NAM SFX PDAT, Individual or Organization Data: Suffix; PARTY-US NAM IID PDAT, Individual or Organization Data: Individual ID number; PARTY-US NAM IRF PDAT, Individual or Organization Data: Individual reference number; PARTY-US NAM SYN PDAT, Individual or Organization Data: Synonym, cross reference; PARTY-US NAM ONM PDAT, Individual or Organization Data: Organization name; PARTY-US NAM OID PDAT, Individual or Organization Data: Identifying number of organization; PARTY-US NAM ODV PDAT, Individual or Organization Data: Division of organization; PARTY-US NAM DID PDAT, Individual or Organization Data: Identifying number of division; PARTY-US ADR NAM PDAT, Individual or organization address: Name, organization, if part of address; PARTY-US ADR OMC PDAT, Individual or organization address: Organization mail code; PARTY-US ADR PBOX PDAT, Individual or organization address: Post office box number; PARTY-US ADR STR PDAT, Individual or organization address: Street, house number or name, district (of city), apt. number, etc. PARTY-US ADR CITY PDAT, Individual or organization address: City or town; PARTY-US ADR CNTY PDAT, Individual or organization address: County, parish, department, etc.; PARTY-US ADR STATE PDAT, Individual or organization address: Region of country (state, province, etc); PARTY-US ADR CTRY PDAT, Individual or organization address: Country; PARTY-US ADR PCODE PDAT, Individual or organization address: Postal code; PARTY-US ADR EAD PDAT, Individual or organization address: Electronic address (e.g., e-mail); PARTY-US ADR TEL PDAT, Individual or organization address: Telephone number, including area or regional code; PARTY-US ADR FAX PDAT, Individual or organization address: Facsimile telephone number; RESIDENCE MILS PDAT, Place of residence: Military service; RESIDENCE CITY PDAT, Place of residence: City; RESIDENCE STATE PDAT, Place of residence: State; RESIDENCE CTRY PDAT, Place of residence: Country; PARTY-US DTXT PDAT – Descriptive text; RCTRY CTRY – Country of residence (ST.3); NCTRY CTRY – Country of nationality (ST.3). 118. <ADR>: AddRess. Address information. Contains any organization name; organization mail code; post office box; street address; city or town; county, parish, or department, etc.; region (state, province, etc.); country; postal code; electronic address (e-mail); telephone number including country and area codes; and facsimile machine number including country and area codes. An end tag is required. Attribute(s): None Content model: <!ELEMENT ADR - - (OMC?,PBOX?,STR\*,CITY?,CNTY?,STATE?,CTRY?,PCODE?,EAD\*,TEL\*,FAX\*) >

Example 119. <CITY>: CITY. City or town. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT CITY - - (PDAT) > Example 120. <CNTY>: CouNTY. County, parish, department, etc. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT CNTY - - (PDAT) > Example. 121. <DID>: Division IDentification. Identifying number of a division within an organization. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT DID - - (PDAT) > Example 122. <EAD>: Electronic ADdress. Electronic address, for example, an e-mail address. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT EAD - - (PDAT) > Example 123. <FAX>: TeleFAX number.

Number for a telefacsimile machine. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT FAX - - (PDAT) > Example 124. <FNM>: First NaMe. Given name and middle name(s) or initials. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT FNM - - (PDAT) > Example. 125. <IID>: Individual ID number. Individual identification number, for example, a U.S. social-security number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT FAX - - (PDAT) > Example 126. <IRF>: Individual ReFerence number. Individual reference number, for example, the inventor’s filing number or his attorney’s docket number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT FNM - - (PDAT) > Example 127. <MILS>: MILitary Service. Military service where the applicant is considered to reside. Contains parsable character data, custom characters, or revision markers. An end tag is required. Military service is indicated by one of the abbreviations in the following table. When in doubt, or if the service in question is not in this table, the service name is given in full, without abbreviation. USN US Navy, USA US Army, USAF US Air Force, USMC US Marine Corp, USCG US Coast Guard. Attribute(s): None Content model: <!ELEMENT MILS - - (PDAT) > Example. 128. <NAM>: NAMe. Name of a person, or, in some cases, an organization. Contains either any personal or professional title, any given and middle name and/or initials, family name, any personal or professional suffixes, any individual identification number, and any individual reference number; or, an organizational name, any synonyms or cross references, any organizational ID number; and any number of organizational division name and any corresponding identification number. An end tag is required. Attribute(s): None Content model: <!ELEMENT NAM - - ((TTL?,FNM?,SNM,SFX?,IID?,IRF?) | (ONM,SYN\*,OID?,(ODV,DID?)\*)) > Example 129. <NCTRY>: Nationality CounTRY. The country of nationality of the individual. Contains the country code. An end tag is required. Attribute(s): None Content model: <!ELEMENT NCTRY - - (CTRY) > Example 130. <ODV> : Organization DiVision. Identification of a division or other subunit of the parent organization. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Attribute(s): None

Content model: <!ELEMENT ODV - - (STEXT+) > Example. 131. <ONM> : Organization NaMe.

Name of an organization. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required.

Attribute(s): None Content model: <!ELEMENT ONM - - (STEXT+) > Example 132. <OID>: Organization ID. Identification number for an organization. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT OID - - (PDAT) > Example 133. <OMC>: Organizational Mail Code.

Organizational mail code for routing within the organization. Contains parsable character data,

custom characters, or revision markers. An end tag is required. Use this element especially for military addresses, for example, “Unit 3400 Box 672 APO AE 091238.” Attribute(s): None Content model: <!ELEMENT OMC - - (PDAT) > Example. 134. <PARTY-US>: PARTY (U.S. only). Identification of individuals or organizations. Contains a name, optional address, optional place of residence, optional descriptive text, optional country of residence, and optional country of nationality. An end tag is required. Attribute(s): None Content model: <!ELEMENT PARTY-US - - (NAM,ADR?,RESIDENCE?,DTXT?,RCTRY?,NCTRY?) > Example 135. <PBOX>: Post-office BOX number. Post-office or other type of box number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT PBOX - - (PDAT) > Example 136. <PCODE>: Postal CODE or zip code.

Postal code or zip code. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT PCODE - - (PDAT) > Example 137. <RCTRY>: Residence CounTRY. Country of residence of an individual. Contains a country code. An end tag is required. Attribute(s): None Content model:

<!ELEMENT RCTRY - - (CTRY) > Example. 138. <RESIDENCE> : RESIDENCE. Place of residence. Contains the name of a U.S. military service, or a city followed by a state or country. An end tag is required. Attribute(s): None Content model: <!ELEMENT RESIDENCE - - (MILS | (CITY,(STATE | CTRY))) > Example 139. <SFX>: SuFfiX. Personal or professional suffix, for example, II, Jr., Esq., OSB, etc. Contains parsable character data, custom characters, or revision markers. An end tag is required. Multiple suffixes are separated by a comma and space. Attribute(s): None Content model: <!ELEMENT SFX - - (PDAT) > Example 140. <SNM>: SurNaMe. Family name, last name, or surname; or the name of an organization. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Use of this tag for an organization is deprecated. Instead, use ONM. Use of this tag for suffix information is deprecated. Instead, use SFX. When SNM is part of a patent citation (see B561), the surname may be followed by “et al.” indicating that the patent cited had more than one inventor. Attribute(s): None Content model: <!ELEMENT SNM - - (STEXT+) > Example. 141. <STATE>: STATE. Region of a country, that is, a state or province or the administrative equivalent. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT STATE - - (PDAT) > Example 142. <STR>: STReet. Street, house number or house name. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT STR - - (PDAT) > Example 143. <SYN> : SYNonym. Synonym or cross reference. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT SYN - - (PDAT) > Example 144. <TEL>: TELephone number. Telephone number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT TEL - - (PDAT) > Example. 145. <TTL>: TiTLe. Personal or professional title, for example, Mr., Mrs., Hon., etc., that precedes a name. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT TEL - - (PDAT) >

# Part 2: SGML Markup for Patent Bibliographic Data.

This part of the Specification provides SGML tags for all bibliographic fields currently appearing in U.S. patent grants. A number of tags have the code US appended to them indicating that the content models deviate from the WIPO ST.32 specification to accommodate U.S. practice.

## SEQUENCE LISTINGS

For further details about the content of sequence-listing tags, consult WIPO Standard ST.25 and the Manual of Patent Examining Procedure, sections … . SEQUENCE-LISTING TAGS. Tag: S160, Name: Section 160, Description: Number of sequence Ids; Tag: S-1-V, Name: (1)(v), Description: Computer readable form, Tag: S-1-V-A, Name: (1)(v)(A), Description: Medium type; Type of diskette/tape submitted; Tag: S-1-V-B, Name: (1)(v)(B), Description: Computer; Type of computer used with diskette/tape submitted; Tag: S-1-V-C, Name: (1)(v)(C), Description: Operating system; Tag: S200, Name: Section 200, Description: Structure for S2xx tags; not in ST.25; Tag: S210, Name: Section 210, Description: Sequence identification number; Tag: S211, Name: Section 211, Description: Number of bases or amino acid residues; Tag: S212, Name: Section 212, Description: Presented sequence molecule is DNA or RNA or PRT (protein). If a nucleotide sequence contains both DNA and RNA fragments, the type shall be DNA. In addition, the combined DNA/RNA molecule shall be further described in S220, S221, S222, and S223. Tag: S-2-I, Name: (2)(I), Description: Sequence characteristics; Tag: S-2-I-C, Name (2)(I)(C), Description: Strandedness. If nucleic acid, number of strands of source organism molecule, i.e., whether single stranded, double stranded, both, or unknown to applicant.; Tag: S-2-I-D, Name: (2)(I)(D), Description: Topology. Whether source organism molecule is circular, linear, both, or unknown to applicant. Tag: S-2-II, Name: (2)(iii), Description: Molecule type: genomic RNA, genomic DNA, mRNA, tRNA, rRNA, snRNA, scRNA, preRNA, cDNA to genomic RNA, cDNA to mRNAcDNA to tRNA, cDNA to rRNA, cDNA to snRNA, cDNA to scRNA, other nucleic acid.Tag: S-2-II-A, Name: (2)(ii)(A), Description: Description (protein and peptide); Tag: S-2-III, Name: (2)(iii), Description: Hypothetical? (yes, no); Tag: S-2-IV, Name: (2)(iv), Description: Anti-sense? (yes, no); Tag: S-2-V, Name: (2)(v), Description: Fragment type. For proteins and peptides only, at least one of the following should be included in the sequence listing: N-terminal fragment, C-terminal fragment, and internal fragment.; Tag: S213, Name: Section 213, Description: Organism's scientific name, i.e., genus/species, or 'unknown,' or 'artificial sequence.' If 'unknown' or 'artificial sequence,' describe further in S220, S221, S222, S223.Tag: S-2-VI-B, Name: (2)(vi)(B), Description: Strain; Tag: S-2-VI-C, Name: (2)(vi)(C), Description: Individual isolate; Tag: S-2-VI-D, Name: (2)(vi)(D), Description: Developmental stage. Give developmental stage of source organism and indicate whether derived from germ-line or rearranged developmental pattern. Tag: S-2-VI-E, Name: (2)(vi)(E), Description: Haplotype; Tag: S-2-VI-F, Name: (2)(vi)(F), Description: Tissue type; Tag: S-2-VI-G, Name: (2)(vi)(G), Description: Tissue Type; Tag: S-2-VI-H, Name: (2)(vi)(H), Description: Cell line; Tag: S-2-VI-I, Name: (2)(vi)(I), Description: Organelle; Tag: S-2-VII, Name: (2)(vii), Description: Container for A and B below; Tag: S-2-VII-A, Name: (2)(vii)(A), Description: Library (type and name); Tag: S-2-VII-B, Name: (2)(vii)(B), Description: Clone(s); Tag: S-2-VIII, Name: (2)(vii), Description: Container for A and B below; Tag: S-2-VII-A, Name: (2)(vii)(A), Description: Library (type and name), Tag: S-2-VII-B, Name: (2)(vii)(B), Description: Clone(s); Tag: S-2-VIII, Name: (2)(viii), Description: Position in genome; Tag: S-2-VIII-A, Description: (2)(viii)(A), Description: Chromosome or segment name or number; Tag: S-2-VIII-B, Name: (2)(viii)(B), Description: Map position; Tag: S-2-VIII-C, Name: (2)(viii)(C), Description: Units for map position (genome percent, nucleotide number, etc.); Tag: S220, Name: Section 220, Description: Sequence feature; description a point of biological significance in the sequence. Tag: S221, Name: Section 221, Description: Name/Key. Appropriate identifier for this feature, preferably from WIPO Standard ST.25 (1998), Appendix 2, tables 5 and 6. Tag: S222, Name: Section 222, Description: Location of the feature within the sequence. Where appropriate, state the number of the first and last bases/amino acids in the feature. Old rules: specify location according to syntax of DDBJ, EMBL, or GenBank feature tables definition, including whether feature is on complement of presented sequence; where appropriate, state number of first and last bases/amino acids in feature. Tag: S-2-IX-C, Name: (2)(ix)(C), Description: Method by which the sequence was identified: experiment, similarity with known sequence or to established consensus sequence or to some other pattern. Tag: S223, Name: Section 223, Description: Other relevant information. Limited to approximately 288 characters of text. Tag: S300, Name: Citations, Description: Publication information; Tag: S301, Name: PARTY-US, Description: Authors; Tag: S302, Name: PDAT, Description: Paper title; Tag: S303, Name: PDAT, Description: Journal title; Tag: S304, Name: PDAT, Description: Journal volume number; Tag: S305, Name: PDAT, Description: Journal issue number; Tag: S306, Name: PDAT, Description: Start and end pages; Tag: S307, Name: DATE, Description: Journal publication date; Tag: S308, Name: PDAT, Description: Database name and accession number; Tag: S309, Name: DATE, Description: Database entry date; Tag: S313, Name: PDAT, Description: Relevant residues; Tag: S400, Name: Section 400, Description: The sequence itself. The following table shows the ST.25 Identifier followed by the corresponding Red-Book tag. ST.25 Identifier: 110, Red-Book tag: B720; ST.25 Identifier: 120, Red-Book tag: B540; ST.25 Identifier: 130, Red-Book tag: B540; ST.25 Identifier: 140, Red-Book tag: B210; ST.25 Identifier: 141, Red-Book tag: B220; ST.25 Identifier: 150, Red-Book tag: B310; ST.25 Identifier: 151, Red-Book tag: B320; ST.25 Identifier: 160, Red-Book tag: S160; ST.25 Identifier: 170, Red-Book tag: S170; ST.25 Identifier: n/a, Red-Book tag: S200; ST.25 Identifier: 210, Red-Book tag: S210; ST.25 Identifier: 211, Red-Book tag: S211; ST.25 Identifier: 212, Red-Book tag: S212; ST.25 Identifier: 213, Red-Book tag: S213; ST.25 Identifier: 220, Red-Book tag: S220; ST.25 Identifier: 221, Red-Book tag: S221; ST.25 Identifier: 222, Red-Book tag: S222; ST.25 Identifier: 223, Red-Book tag: S223; ST.25 Identifier: 300, Red-Book tag: S300; ST.25 Identifier: 301, Red-Book tag: S301; ST.25 Identifier: 302, Red-Book tag: S302; ST.25 Identifier: 303, Red-Book tag: S303; ST.25 Identifier: 304, Red-Book tag: S304; ST.25 Identifier: 305, Red-Book tag: S305; ST.25 Identifier: 306, Red-Book tag: S306; ST.25 Identifier: 307, Red-Book tag: S307; ST.25 Identifier: 308, Red-Book tag: S308; ST.25 Identifier: 309, Red-Book tag: S309; ST.25 Identifier: 310, Red-Book tag: DNUM; ST.25 Identifier: 311, Red-Book tag: B220; ST.25 Identifier: 312, Red-Book tag: B140; ST.25 Identifier: 313, Red-Book tag: S313; ST.25 Identifier: 400, Red-Book tag: S400. The following table shows the pre-ST.25 tags for which there is no corresponding ST.25 tag followed by the corresponding Red-Book tag. Pre-ST.25 tag: (1)(v), Red-Book tag: S-1-V; Pre-ST.25 tag: (1)(v)(A), Red-Book tag: S-1-V-A; Pre-ST.25 tag: (1)(v)(B), Red-Book tag: S-1-V-B; Pre-ST.25 tag: (1)(v)(C), Red-Book tag: S-1-V-C; Pre-ST.25 tag: (2)(i), Red-Book tag: S-2-I; Pre-ST.25 tag: (2)(i)(C), Red-Book tag: S-2-I-C; Pre-ST.25 tag: (2)(i)(D), Red-Book tag: S-2-I-D; Pre-ST.25 tag: (2)(ii), Red-Book tag: S-2-II; Pre-ST.25 tag: (2)(ii)(A), Red-Book tag: S-2-II-A; Pre-ST.25 tag: (2)(iii), Red-Book tag: S-2-III; Pre-ST.25 tag: (2)(iv), Red-Book tag: S-2-IV; Pre-ST.25 tag: (2)(v), Red-Book tag: S-2-V; Pre-ST.25 tag: (2)(vi)(B), Red-Book tag: S-2-VI-B; Pre-ST.25 tag: (2)(vi)(C), Red-Book tag: S-2-VI-C; Pre-ST.25 tag: (2)(vi)(D), Red-Book tag: S-2-VI-D; Pre-ST.25 tag: (2)(vi)(E), Red-Book tag: S-2-VI-E; Pre-ST.25 tag: (2)(vi)(E), Red-Book tag: S-2-VI-E; Pre-ST.25 tag: (2)(vi)(F), Red-Book tag: S-2-VI-F; Pre-ST.25 tag: (2)(vi)(G), Red-Book tag: S-2-VI-G; Pre-ST.25 tag: (2)(vi)(H), Red-Book tag: S-2-VI-H; Pre-ST.25 tag: (2)(vi)(I), Red-Book tag: S-2-VI-I; Pre-ST.25 tag: (2)(vii), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(vii), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(vii)(A), Red-Book tag: S-2-VII-A; Pre-ST.25 tag: (2)(vii)(B), Red-Book tag: S-2-VII-B; Pre-ST.25 tag: (2)(viii), Red-Book tag: S-2-VIII; Pre-ST.25 tag: (2)(viii)(A), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(viii)(B), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(viii)(C), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(ix)(C), Red-Book tag: S-2-IX-C. 146. <S-1-V>: Computer-readable form. Information about a computer-readable form of the sequence listing. Contains medium type, computer type, and operating system. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-1-V - - (S-1-V-A,S-1-V-B,S-1-V-C) > Example 147. <S-1-V-A>: Medium type. Type of diskette or tape submitted. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-1-V-A - - (PDAT) > Example 148. <S-1-V-B> : Computer type. Type of computer used with the diskette or tape submitted. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-1-V-B - - (PDAT) > Example 149. <S-1-V-C>: Operating system. Operating system required by the diskette or tape submitted. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-1-V-C - - (PDAT) > Example

150. <S-2-I> : Sequence characteristics. Sequence characteristics. Contains strandedness and topology information. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-I - - (S-2-I-C,S-2-I-D) > Example 151. <S-2-I-C> : Strandedness. Strandedness. Contains parsable character data, custom characters, or revision markers. An end tag is required. If the sequence listing represents a nucleic acid, indicates the number of strands of source organism molecule, i.e., whether single stranded, double stranded, both, or unknown to applicant. Attribute(s): None Content model: <!ELEMENT S-2-I-C - - (PDAT) > Example 152. <S-2-I-D> : Topology. Topology. Contains parsable character data, custom characters, or revision markers. An end tag is required. Indicates whether the source organism molecule is circular, linear, both, or unknown to applicant. Attribute(s): None Content model: <!ELEMENT S-2-I-D - - (PDAT) > Example 153. <S-2-II> : Molecule type. Molecule type. Contains parsable character data, custom characters, or revision markers. An end tag is required. Indicates one of the following types: genomic RNA, genomic DNA, mRNA, tRNA, rRNA, snRNA, scRNA, preRNA, cDNA to genomic RNA, cDNA to mRNAcDNA to tRNA, cDNA to rRNA, cDNA to snRNA, cDNA to scRNA, other nucleic acid. Attribute(s): None Content model: <!ELEMENT S-2-II - - (S-2-II-A) > Example 154. <S-2-II-A> : Description. Description (protein and peptide). Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-II-A - - (PDAT) > Example 155. <S-2-III> : Hypothetical. Hypothetical? Contains parsable character data, custom characters, or revision markers. An end tag is required. Indicated by “yes” or “no.” Attribute(s): None Content model: <!ELEMENT S-2-III - - (PDAT) > Example. 156. **<S-2-IV>** : Anti-sense. Anti-sense? Contains parsable character data, custom characters, or revision markers. An end tag is required. Indicated by “yes” or “no.” Attribute(s): None Content model: <!ELEMENT S-2-IV - - (PDAT) > Example 157. <S-2-IX-C>: Identification method. Method by which the sequence was identified, that is, by experiment, similarity with a known sequence or to an established consensus sequence, or to some other pattern. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-IX-C - - (PDAT) > Example 158. <S-2-V>: Fragment type. Fragment type. Contains parsable character data, custom characters, or revision markers. An end tag is required. For proteins and peptides only, at least one of the following should be included in the sequence listing: N-terminal fragment, C-terminal fragment, and internal fragment. Attribute(s): None Content model: <!ELEMENT S-2-V - - (PDAT) > Example. 159. <S-2-VI> : Source. Original source of the molecule. Contains strain (optional), individual isolate, developmental stage, haplotype, tissue type, cell type, cell line, and organelle. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI - - (S-2-VI-B?,S-2-VI-C?,S-2-VI-D?,S-2-VI-E?,S-2-VI-F?, S-2-VI-G?,S-2-VI-H?,S-2-VI-I?) >Example. 160. <S-2-VI-B> : Strain. Strain. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-VI-B - - (PDAT) > Example 161. <S-2-VI-C> : Individual isolate. Individual isolate. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-C - - (PDAT) > Example 162. <S-2-VI-D> : Developmental stage. Developmental stage of source organism and indication of whether derived from germ-line or rearranged developmental pattern. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-D - - (PDAT) > Example 163. <S-2-VI-E> : Haplotype. Haplotype. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-E - - (PDAT) > Example. 164. <S-2-VI-F> : Tissue type. Tissue type. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-F - - (PDAT) > Example 165. <S-2-VI-G> : Cell type. Cell type. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-G - - (PDAT) >. Example. 166. <S-2-VI-H>: Cell line. Cell line. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-H - - (PDAT) > Example 167. <S-2-VI-I> : Organelle. Organelle. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None, Content model: <!ELEMENT S-2-VI-I - - (PDAT) > Example 168. <S-2-VII>: Library and clone. Library and clone. Contains library and clone information. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-VII - - (S-2-VII-A?,S-2-VII-B?) > Example 169. <S-2-VII-A>: Library. Library type and name. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-VII-A - - (PDAT) > Example 170. <S-2-VII-B> Clone. Clone(s). Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-VII-B - - (PDAT) > Example 171. <S-2-VIII>: Position. Position in genome. Contains available information about segment name, map position, and position units. An end tag is required.

Attribute(s): None Content model: <!ELEMENT S-2-VIII - - (S-2-VIII-A?,S-2-VIII-B?,S-2-VIII-C?) > Example 172. <S-2-VIII-A>: Segment name. Chromosome or segment name or number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-VIII-A - - (PDAT) > Example 173. <S-2-VIII-B>: Position. Map position. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S-2-VIII-B - - (PDAT) > Example. 174. <S-2-VIII-C>: Position units. Units for map position. Contains parsable character data, custom characters, or revision markers. An end tag is required. Units expressed as genome percent, nucleotide number, etc. Attribute(s): None Content model: <!ELEMENT S-2-VIII-C - - (PDAT) > Example 175. <S160>: Number of IDs. Number of sequence IDs. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S160 - - (PDAT) > Example

176. <S200>: Sequence information. Sequence listing information. Contains ID number, number of bases, sequence type, any sequence characteristics, any molecule type, any “hypothetical” flag, any “anti-sense” flag, any fragment type, scientific name, any source information, any library or clone information, any position information, any number of sequence features, any number of public information statements, any number of literature citations, and the sequence listing. An end tag is required. Attribute(s): None Content model:

<!ELEMENT S200 - - (S210,S211,S212,S-2-I?,S-2-II?,S-2-III?,S-2-IV?,S-2-V?,S213,

S-2-VI?,S-2-VII?,S-2-VIII?,S220\*,S300\*,CIT\*,S400) > Example 177. <S210>: ID number.

Sequence identification number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S210 - - (PDAT) > Example 178. <S211>: Number of bases. Number of bases or amino acid residues. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S211 - - (PDAT) > Example 179. <S212>: Sequence type. Indicates the type of the presented sequence molecule. Contains parsable character data, custom characters, or revision markers. An end tag is required.

Sequence type is DNA or RNA or PRT (protein). If a nucleotide sequence contains both DNA and RNA fragments, the type shall be DNA. In addition, the combined DNA/RNA molecule shall be further described in S220, S221, S222, and S223. Attribute(s): None Content model: <!ELEMENT S212 - - (PDAT) > Example 180. <S213>: Scientific name. Scientific name of the organism from which the sequence is taken. Contains parsable character data, custom characters, or revision markers. An end tag is required. Express the name as, for example, genus/species, or 'unknown,' or 'artificial sequence.' If 'unknown' or 'artificial sequence,' describe further in S220, S221, S222, S223. Attribute(s): None Content model: <!ELEMENT S213 - - (PDAT) > Example 181. <S220>: Feature. Description of a sequence feature, that is, a point of biological significance in the sequence. Contains name, location, any identification method, and other relevant information. An end tag is required. Attribute(s): None Content model: <!ELEMENT S220 - - (S221,S222,S-2-IX-C?,S223) > Example 182. <S221>: Feature name. An appropriate identifier (name or key) for a feature. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Identifiers taken from WIPO Standard ST.25 (1998), Appendix 2, tables 5 and 6, are preferred. Attribute(s): None Content model: <!ELEMENT S221 - - (STEXT+) > Example 183. <S222>: Location. Location of the feature within the sequence. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Where appropriate, state the number of the first and last bases/amino acids in the feature. Old rules: specify location according to syntax of DDBJ, EMBL, or GenBank feature tables definition, including whether feature is on complement of presented sequence; where appropriate, state number of first and last bases/amino acids in feature. Attribute(s): None Content model: <!ELEMENT S222 - - (STEXT+) > Example 184. <S223>: Other information. Other relevant information. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Limited to approximately 288 characters of text based on requirements of internal PTO systems. Attribute(s): None

Content model: <!ELEMENT S223 - - (STEXT+) > Example 185. <S300>: Publication information. Publication information. Contains any of the following where available: authors, title, journal title, volume, issue, pages, publication date, database accession number, database accession date, and relevant residues. An end tag is required. Attribute(s): None Content model: <!ELEMENT S300 - - S301?,S302?,S303?,S304?,S305?,S306?,S307?,S308?,

S309?,S313?) >Example 186. <S301>: Author(s). Author(s) of the publication. Contains one or more parties, which see for details. An end tag is required. Attribute(s): None Content model: <!ELEMENT S301 - - (PARTY-US+) > Example 187. <S302>: Title. Title of the paper. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S302 - - (PDAT) > Example 188. <S303>: Journal. Title of the journal or serial in which the paper was published. Contains parsable character data, custom characters, or revision markers. An end tag is required. The title is transcribed exactly from the file wrapper. Title abbreviations are those used by the applicant. Attribute(s): None Content model: <!ELEMENT S303 - - (PDAT) > Example 189. <S304>: Volume. Volume number of the journal in which the paper was published. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S304 - - (PDAT) > Example 190. <S305>: Issue. Issue number or name in which the paper was published. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S305 - - (PDAT) > Example 191. <S306>: Pages. The page numbers where the paper was published. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S306 - - (PDAT) > Example 192. <S307>: Publication date. Date that the paper was published. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT S307 - - (DATE,PDAT) > Example 193. <S308>: Accession number. Database accession number and the name of the database. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S308 - - (PDAT) > Example 194. <S309>: Accession date. Date that the sequence was posted to the database. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT S309 - - (DATE) > Example 195. <S313>: Relevant residues. Relevant residues. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S313 - - (PDAT) > Example

196. <S400>: Sequence. The sequence listing. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT S400 - - (PDAT) > Example

## Patent Bibliographic (Front Page) Information

U.S. Bib Tags. Tag: B110, Content: DNUM, Description: Document Identification – Number of the patent document, usually the publication number; Tag: B122US, Content: PDAT, Document Identification – SIR explanation (fixed text); Tag: B130, Content: PDAT, Description: Document identification Kind of document (ST.16); Tag: B140, Content: DATE, Description: Document Identification - Document date, usually date of publication; Tag: B190, Content: PDAT, Description: Document Identification – Publishing country or organization (ST.3); Tag: B210, Content: DNUM, Description: Domestic Filing Data –Number assigned to the application; Tag: B211US, Content: PDAT, Description: Domestic Filing Data – Series code; Tag: B220, Content: DATE, Description: Domestic Filing Data – Application filing date; Tag: B221US, Content: Empty, Description: Domestic Filing Data – Rule 47 flag; Tag: B222US, Name: EMPTY, Description: Domestic Filing Data – CPA flag; Tag: B310, Content: DNUM, Description: Foreign Priority Data – Priority application number; Tag: B320, Content: DATE, Description: Foreign Priority Data - Date of filing of priority application; Tag: B330, Content: CTRY, Description: Foreign Priority Data – Publishing country or organization (ST.3); Tag: B472, Content: None, Description: Public Availability Dates – Term of grant; Tag: B473, Content: DATE, Description: Public Availability Dates - Disclaimer date; Tag: B473US, Content: EMPTY, Description: Public Availability Dates – Terminal disclaimer flag; Tag: B474, Content: PDAT, Description: Public Availability Dates – Term of grant; Tag: B474US, Content: PDAT, Description: Public Availability Dates – Term of extension (35USC154(b)); Tag: B510, Content: None, Description: Technical Information – International Patent Classification (IPC) data; Tag: B511, Content: PDAT, Description: Technical Information – Main classification; Tag: B512, Content: PDAT, Description: Technical Information – Further classification; Tag: B516, Content: PDAT, Description: Technical Information – Edition of IPC; Tag: B520, Content: None, Description: Domestic or national classification; Tag: B521, Content: PDAT, Description: Technical Information – Main classification; Tag: B522, Content: PDAT, Description: Technical Information – U.S.: Official cross-reference classification; Tag: B522US, Content: PDAT, Description: Technical Information – U.S.: Unofficial cross-reference classification; Tag: B540, Content: STEXT, Description: Technical Information - Title of the invention; Tag: B560, Content: None, Description: Technical Information – Citations; Tag: B561, Content: PCIT, Description: Technical Information – Patent citation (with B563 and B564); Tag: B562, Content: NCIT, Description: Technical Information – Non-Patent citation (with B563 and B564); Tag: B570; Content: None, Description: Technical Information – Claims allowed, or representative claim(s); Tag: B577, Content: PDAT, Description: Technical Information - Number of claims allowed; Tag: B578US, Content: PDAT, Description: Technical Information – Exemplary claim number; Tag: B580, Content: None, Description: Technical Information – Field of search; Tag: B581, Content: PDAT, Description: Technical Information – IPC; Tag: B582, Content: PDAT, Description: Technical Information – National classification (structured); Tag: B583US, Content: PDAT, Description: National classification (unstructured); Tag: B590, Content: None, Description: Specification and drawing; Tag 594US, Content: PDAT, Description: Number of microforms and pages thereon; Tag: 595, Content: PDAT, Description: Number of drawing sheets; Tag: B595US, Content: PDAT, Description: Number of drawing sheets submitted in color; Tag: B596, Content: PDAT, Description: Number of figures; Tag: B600, Content: None, Description: Related patents or applications; Tag: B610, Content: PARENT-US, Description: Earlier document to which this Is an addition; Tag B620, Content: PARENT-US, Description: Earlier application from which the present document has been divided out; Tag: B630, Conent: None, Description: Continuations; Tag: B631, Content: PARENT-US, Description: Earlier application of which the present document is a continuation; Tag: B632, Content: PARENT-US, Description: Document of which this a continuation-in-part; Tag: B633, Content: PARENT-US, Description: Document of which this a continuing reissue; Tag: B640, Content: PARENT-US, Description: Document being reissued; Tag: B641US, Content: PARENT-US-SIBLING, Description: Divisional reissue of a related U.S. document; Tag: B645, Content: PARENT-US, Description: Document of which this is a reexamination; Tag: B650, Content: DOC, Description: Previously-published document concerning the same application; Tag: B660, Content: PARENT-US, Description: Document for which this is a substitute; Tag: B680US, Content: DOC, Description: Provisional application; Tag: B700, Content: None, Description: Parties Concerned with the Document; Tag: B720, Content: None, Description: Inventor information; Tag: B721, Content: PARTY-US, Description: Name and address; Tag: B730, Content: None, Description: Grantee (assignee) information; Tag: B731, Content: PARTY-US, Description: Name and address; Tag: B732US, Content: PDAT, Description: Assignee type code (USPTO); Tag: B740, Content: None, Description: Attorney, agent, representative information; Tag: B741, Content: PARTY-US, Description: Name and address; Tag: B745, Content: None, Description: Persons acting upon the document; Tag: B746, Content: PARTY-US, Description: Primary examiner; Tag: B747, Content: PARTY-US, Description: Assistant examiner; Tag: B748US, Content: PDAT, Description: Technology center, etc.; Tag: B800, Content: None, Description: International Convention Data other than the Paris Convention; Tag: B830, Content: None, Description: Microorganism deposits information; Tag: B831, Content: PDAT, Description: Deposit file number; Tag: B832, Content: PDAT, Description: Authority where deposit made; Tag: B833, Content: DATE, Description: Date of deposit; Tag: B860, Content: None, Description: PCT or regional filing information; Tag: B861, Content: DOC, Description: Document Identification; Tag: B863, Content: DATE, Description: 35USC371 Date; Tag: B864, Content: DATE, Description: 35USC102(e) Date; Tag: B870, Content: None, Description: PCT or regional publication information; Tag: B871, Content: DOC, Description: Document identification.

### Document Identification

197. <B100>: Document identification. Document identification. Contains a document number, optional Statutory Invention Registration explanation, document kind code, document date, and country of publication. An end tag is required. Attribute(s): None Content model: <!ELEMENT B100 - - (B110,B122US?,B130,B140,B190) > Example 198. <B110>: Document number.

Document number. Contains a document number, optional Statutory Invention Registration explanation, document kind code, document date, and country of publication. An end tag is required. Attribute(s): None Content model: <!ELEMENT B100 - - (B110,B122US?,B130,B140,B190) > Example 199. <B122US>: Statutory Invention Registration flag (U.S. only). Statutory Invention Registration (SIR) flag. Contains parsable character data, custom characters, or revision markers. An end tag is required. If this tag is present, the following text is displayed on the front page of the patent: "A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C.157.” Although boiler-plate text such as this may be rendered from a style sheet, it must also be present in each document instance to which it applies. Attribute(s): None

Content model: <!ELEMENT B122US - - (PDAT) > Example 200. <B130>: Document kind.

Document kind code from WIPO Standard ST.16. Contains parsable character data, custom

characters, or revision markers. An end tag is required. For U.S. documents, the following kind codes are used: A = Utility Patent, Bx = Reexamination Certificate, where x is an integer (e.g., B1, B3), E = Reissue Patent, H = Statutory Invention Registration, P = Plant Patent, S = Design Patent. For reexamination certificates, the integer indicates the degree of reexamination (B1 = first reexamination, B2 = second reexamination, etc.). Attribute(s): None Content model: <!ELEMENT B130 - - (PDAT) > Example 201. <B140>: Document date. Document date is either the date of publication for an application or date of grant for a patent. For Grant Red Book documents, this is always the date of grant which is also the day that the specification is published and that the grant is announced in the Official Gazette. Attribute(s): None Content model: <!ELEMENT B140 - - (DATE) > Example 202. <B190>: Publishing country or organization. WIPO Standard ST.3 code for the publishing country or organization. Contains parsable character data, custom characters, or revision markers. An end tag is required. For Grant Red Book documents, the content of this element is always “US”. Attribute(s): None

Content model: <!ELEMENT B190 - - (PDAT) > Example Domestic Filing Data 203. <B200>: Domestic filing data. Domestic filing information. Contains an application number, series code, filing date, an optional rule 47 flag, and an optional CPA flag. An end tag is required. Attribute(s): None Content model: <!ELEMENT B200 - - (B210,B211US,B220,B221US?,B222US?) > Example 204. <B210>: Application number.

Application number. Contains a document number structure. An end tag is required. For U.S. documents, the application number is composed of a series code followed by a serial number, left-padded with zero to six digits. Attribute(s): None Content model: <!ELEMENT B210 - - (DNUM) > Example 205. <B211US>: Series code (U.S. only). Patent applications in the U.S. are numbered consecutively from 1 through 999,999, after which the numbering restarts from 1. To distinguish between the different applications that would otherwise have the same number, a series code is prefixed to the serial number. Series codes can also be used to distinguish various application types. Contains parsable character data, custom characters, or revision markers. An end tag is required. A series code consists of a two-digit number, left padded with zero where necessary, representing the following time periods and document types:

02 through 1947-12-31, 03 1948-01-01 through 1959-12-31, 04 1960-01-01 through 1969-12-31, 05 1970-01-01 through 1978-12-31, 06 1979-01-01 through 1986-12-31, 07 1987-01-01 through 1992-12-31, 08 1993-01-01 through 1997-12-29, 09 1997-12-30 and after 02 through 28 Utility application, 29 Design application, 60 Provisional application, 90 Reexamination request. The series code is also part of a U.S. application number encoded in DNUM.

Attribute(s): None. Content model: <!ELEMENT B211US - - (PDAT) > Example. 206. <B220>: Application filing date. Date that the application was filed. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT B220 - - (DATE) >

Example 207. <B221US>: Rule 47 flag (U.S. only). When present, this tag signifies that the application was filed under Rule 47, indicating that the applicant(s) refused to execute the application or could not be found. An end tag is forbidden. Attribute(s): None

Content model: <!ELEMENT B221US - O EMPTY > Example 208. <B222US>: CPA flag (U.S. only). The presence of this element signifies that the prosecution of the application includes the Continued Prosecution Application (CPA) procedure. An end tag is forbidden. Attribute(s): None

Content model: <!ELEMENT B222US - O EMPTY > Example

### Foreign Priority Data

209. <B300>: Foreign priority data. Foreign priority data. Contains a priority application number, publication date, and publishing country or organization. An end tag is required. Attribute(s): None Content model: <!ELEMENT B300US - - (B310,B320,B330) > Example 210. <B310>: Priority application number. The application number of the priority document. Contains a document identification. An end tag is required. Attribute(s): None Content model: <!ELEMENT B310 - - (DNUM)> Example 211. <B320>: Priority filing date. Filing date of the priority application. Attribute(s): None Content model: <!ELEMENT B320 - - (DATE) > Example 212. <B330>: Publishing country or organization. Country or organization code for the country that published the priority document. Contains a country code. An end tag is required. Attribute(s): None Content model: <!ELEMENT B330 - - (CTRY) > Example

### Public Availability Dates

 213. <B400>: Public availability dates. Public availability dates and term of protection.

Attribute(s): None Content model: <!ELEMENT B400 - - (B472) > Example 214. <B472>: Term of grant. Term of grant. Contains a disclaimer date, a terminal-disclaimer flag, a term of grant, and a term extension, all of which are optional. An end tag is required. For U.S. design patents, B474 is required, even though it is optional for all other types of U.S. patents. Attribute(s): None

Content model: <!ELEMENT B472 - - (B473?,B473US?,B474?,B474US?) > Example 215. <B473>: Disclaimer date. Date upon which part or all of the term of the patent was disclaimed. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT B473 - - (DATE) > Example 216. <B473US>: Terminal disclaimer flag (U.S. only). When present, this tag signifies that the patent is subject to a terminal disclaimer. An end tag is forbidden. Attribute(s): None Content model: <!ELEMENT B473US - O EMPTY > Example. 217. <B474>: Term of grant. Term of grant. Contains parsable character data, custom characters, or revision markers. An end tag is required. The term of the patent is expressed as a number of years with no more than two digits. Attribute(s): None Content model: <!ELEMENT B474 - - (PDAT) > Example

218. <B474US>: Term extension (U.S. only). Indicates that the term of the patent has been extended under 35 USC 154(b) by showing the length of the extension. Contains parsable character data, custom characters, or revision markers. An end tag is required. The content of this tag must be literally either “5 years”, or the number of days (as an integer) if the extension is less than five years. Attribute(s): None Content model: <!ELEMENT B474US - - (PDAT) > Example.

### Technical Information

219. <B500>: Technical information. Technical details of the document. Contains both international and domestic classification information, the field of search, information about other patents and non-patent literature cited (optional), the number of claims, which claim is the exemplary claim, and information about drawings that may be present. Attribute(s): None. Content model: <!ELEMENT B500 - - (B510,B520,B540,B560?,B570,B580,B590?) > Example. 220. <B510>: IPC data. International Patent Classification (IPC) data for patents other than designs, or the Locarno Classification (LC) for design patents. Contains the main IPC (LC), an optional further IPC (LC), and the IPC (LC) edition number. An end tag is required. In U.S. documents other than design patents, the IPC is formatted as fixed-length records as described here: Position:1, Content: Section, Format: 1 alphabetic; Position: 2 – 3, Content: Class 2, Format: numeric; Position: 4, Content: Subclass, Format: 1 alphabetic; Position: 5 – 7, Content: Group, Format: 3 alphanumeric, right justified, leading spaces; Position: 8 +, Content: Subgroup, Format: Up to 7 alphanumeric. In U.S. documents which are design patents, the Locarno Classification (LC) is formatted as fixed-length records as described here: Position: 1 – 2, Content: Class, Format: 2 numeric, right justified, leading zeros; Position: 3 – 4, Content: Subclass, Format: 2 numeric, right justified, leading zeros; Attribute(s): None. Content model: <!ELEMENT B510 - - (B511,B512\*,B516) >

Example. 221. <B511>: Main international classification. International Patent Classification (IPC) main classification or Locarno Classification if the document is a design patent. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B512 - - (PDAT) > Example. 222. <B512>: Further IPC classification. Further IPC classification, that is, an additional classification (equivalent to U.S. cross-reference classification). Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B512 - - (PDAT) > Example 223. <B516>: IPC edition. Indicates the edition number and/or version of the International Patent Classification (IPC) from which the classifications in B500 have been taken. Contains parsable character data, custom characters, or revision markers. An end tag is required. The edition number is a single-digit number. Attribute(s): None Content model: <!ELEMENT B516 - - (PDAT) > Example 224. <B520>: National classification. Domestic or national classification data. Contains a main classification, any number of official cross-reference classifications, and any number of un-official cross-reference classifications. An end tag is required. For U.S. patents this is always the United States Patent Classification (USPC). Attribute(s): None Content model: <!ELEMENT B520 - - (B521,B522\*,B522US\*) > Example 225. <B521>: National main classification.

Domestic or national main classification. Contains parsable character data, custom characters, or revision markers. An end tag is required. For U.S. patents, this is the original (OR) classification which is based on the primary claim of the invention. Attribute(s): None Content model: <!ELEMENT B521 - - (PDAT) > Example 226. <B522>: Further national classification.

Further classification. Contains parsable character data, custom characters, or revision markers.

An end tag is required. For U.S. patents, this is a cross-reference classification. Use this element only for official cross references. For unofficial cross-references, use B522US. Attribute(s): None Content model: <!ELEMENT B522 - - (PDAT) > Example 227. <B522US>: Further national classification (U.S. only). Further classification. Contains parsable character data, custom characters, or revision markers. An end tag is required. For U.S. patents, this is a cross-reference classification. Use this element only for unofficial cross references.

For official cross-references, use B522. Attribute(s): None Content model: <!ELEMENT B522US - - (PDAT) > Example228. <B540>: Title of invention. Title of the invention. Contains one or more of: parsable character data, custom characters, or revision markers; or a footnote reference; or an image; or highlighting. An end tag is required. Attribute(s): None Content model: <!ELEMENT B540 - - (STEXT+) > Example 229. <B560>: Citations. Citations of other documents. Contains at least one of patent citations or non-patent literature citations. An end tag is required. References to U.S. patents appear before references to foreign patents when both types are present. Attribute(s): None Content model: <!ELEMENT B560 - - (B561 | B562)+ > Example 230. <B561>: Patent citation. Citation of a patent document. Contains one patent citation. An end tag is required. Attribute(s): None Content model: <!ELEMENT B561 - - (PCIT) > Example 231. <B562>: Non-patent citation. Citation of non-patent literature. Contains one non-patent citation. An end tag is required. Attribute(s): None Content model: <!ELEMENT B562 - - (NCIT) > Example 232. <B570>: Claims information. Information about the claims. Contains the number of allowed claims and any number of exemplary claim numbers. An end tag is required. For claims, see the element SDOCL and its substructures. Attribute(s): None Content model: <!ELEMENT B570 - - (B577,B578US\*) > Example 233. <B577>: Number of claims allowed. Number of claims allowed. Contains parsable character data, custom characters, or revision markers. An end tag is required. For U.S. design patents and plant patents the contents of this element will be the digit “1” since these types of patents can have only one claim.

Attribute(s): None Content model: <!ELEMENT B577 - - (PDAT) > Example 234. <B578US>: Exemplary claim number (U.S. only). The exemplary claim number. The exemplary claim is the claim published in the Official Gazette. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B578US - - (PDAT) > Example 235. <B580>: Field of search. The field of search, that is, the classification(s) in which the examiner searched. Contains any number of IPCs, one or more USPCs searched in structured format, and any number of USPCs searched in unstructured format. An end tag is required. Attribute(s): None Content model: <!ELEMENT B580 - - (B581\*,(B582|B583US)+) > Example 236. <B581>: IPCs searched. The International Patent Classifications (IPCs) that were searched by the examiner. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B581 - - (PDAT) > Example 237. <B582>: National classifications searched. U.S. Patent Classifications (USPCs) searched by the examiner. Contains parsable character data, custom characters, or revision markers. An end tag is required. Use this element for structured USPCs only, formatted as follows. See also B583US. Position: 1-3, Content: U.S. Class, 3 positions, Description: 3 alphanumeric, right justified with leading space; or

“D” followed by 1 or 2 right-justified digits with leading space; or “PLT”; Position: 4+, Content: U.S. Subclass, variable length, Description: 3 alphanumeric, right justified with leading space followed by optional decimal portion of 1 to 3 characters, left justified (decimal point

implied); or 3 alphabetic (“DIG”, “FOR”, etc.). Attribute(s): None Content model: <!ELEMENT B582 - - (PDAT) > Example 238. <B583US>: National classifications searched (U.S. only).

U.S. Patent Classifications (USPCs) searched by the examiner. Contains parsable character data, custom characters, or revision markers. An end tag is required. Use this element for unstructured USPCs only, which could be any combination of classes, subclasses, or ranges of subclasses, etc. See also B582. Attribute(s): None Content model: <!ELEMENT B583US - - (PDAT) > Example 239. <B590>: Specification and drawings information. Information about the specification and drawings. Contains attachments, number of drawing sheets, number of drawing sheets in color, and the number of figures. An end tag is required. Attribute(s): None

Content model: <!ELEMENT B590 - - (B594US?,B595?,B595US?,B596) > Example 240. <B594US>: Attachments (U.S. only). Information about attachments. Contains parsable character data, custom characters, or revision markers. An end tag is required. If there is an optical-microform appendix (microfiche, microfilm, microcard, etc.), the number of microforms and the number of pages imaged thereon (separated by a comma) are placed in this element. Attribute(s): None Content model: <!ELEMENT B594US - - (PDAT) > Example 241. **<B595>** : Number of drawing sheets. The number of pages of drawings submitted by the applicant. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B595 - - (PDAT) > Example 242. <B595US>: Number of drawing sheets in color (U.S. only). The number of pages of drawings in color submitted by the applicant. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B595US - - (PDAT) > Example 243. <B596>: Number of figures. The number of figures submitted by the applicant. Contains parsable character data, custom characters, or revision markers. An end tag is required. The number of figures might not be the same as the number of drawing pages and is usually greater. Attribute(s): None Content model: <!ELEMENT B596 - - (PDAT) > Example

### Related Patents or Applications

244. <B600>: Related patents or applications. Various relationships between the patent in hand and other patent grants or applications. Contains either an additional application, a divisional application, continuations, reissues, divisional reissues, reexamination, merged reissues reexamination, substitute, or provisional application. An end tag is required. Attribute(s): None

Content model: <!ELEMENT B600 - - (B610 | B620 | B630 | B640 | B641US | B645 | B645US | B660 | B680US)+) > Example 245. <B610>: Additional application. Earlier application to which the present document is an addition. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B610 - - (PARENT-US) > Example 246. <B620>: Divisional application. Earlier application from which the present document has been divided out. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B620 - - (PARENT-US) > Example. 247. <B630>: Continuations. Identification of document(s) to which the present document is some type of continuation.

Contains one or more of: a continuation, or a continuation-in-part, or a continuing reissue. An end tag is required. Attribute(s): None Content model: <!ELEMENT B630 - - (B631 | B632 | B633)+ > Example 248. <B631>: Continuation. Earlier application of which the present document is a continuation. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B631 - - (PARENT-US) > Example 249. <B632>: Continuation-in-part. Earlier application of which the present document is a continuation-in-part. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B632 - - (PARENT-US) > Example 250. <B633>: Continuing reissue. Earlier document of which the present document is a continuing reissue. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B633 - - (PARENT-US) >Example 251. <B640>: Reissue. Earlier document of which the present document is a reissue. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B640 - - (PARENT-US) > Example 252. <B641US>: Divisional reissue (U.S. only). Identification of related U.S. documents of which the present document is a divisional reissue. Contains a parent document and one or more sibling documents. An end tag is required. Attribute(s): None Content model: <!ELEMENT B641US - - (PARENT-US,SIBLING+) > Example 253. <B645>: Reexamination. U.S. patent of which the present document is a reexamination. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B645 - - (PARENT-US) > Example 254. <B645US>: Merged reissue-reexamination flag/text (U.S. only). This element is present when a reissue application was merged with a reexamination proceeding. Contains parsable text data, custom characters, or revision markers. An end tag is required. The issuing document is a reissue patent that shows the following Reexamination results statement on the reissue patent front page, immediately following the abstract (where NNNNN represents the Reexamination Request Number, and YYYYMMDD the filing date): “The questions raised in reexamination request No.90/NNNNN, filed YYYYMMDD, have been considered and the results thereof are reflected in this reissue patent which constitutes the reexamination certificate required by 35 USC 307 as provided in 37 CFR 1.570(e).” Attribute(s): None Content model: <!ELEMENT B645US - - (PDAT) > Example 255. <B650>: Previously-published document. Previously-published document concerning the same application. Contains a document identification. An end tag is required. Attribute(s): None Content model: <!ELEMENT B650 - - (DOC) > Example 256. <B660>: Substitute. Identification of the document for which the present document is a substitute. Contains one parent document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B660 - - (PARENT-US) > Example 257. <B680US>: Provisional application (U.S. only). Identification of the provisional application upon which the present document was based. Contains one document identification. An end tag is required. Attribute(s): None Content model: <!ELEMENT B680US - - (DOC) > Example Parties Concerned with the Document 258. <B700>: Parties concerned with the document. Various parties concerned with the document. Contains an inventor, an assignee (optional), an attorney (optional), and other persons acting on the document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B700 - - (B720,B730?,B740?,B745) > Example 259. <B720>: Inventor information. Identification of the inventor(s) associated with the document. Contains one or more inventors. An end tag is required. Attribute(s): None Content model: <!ELEMENT B720 - - (B721+) > Example 260. <B721>: Inventor. Name, address, and residence of the inventor(s) associated with the document. Contains the structure for identifying an individual or organization and associated address information. An end tag is required. Attribute(s): None Content model: <!ELEMENT B721 - - (PARTY-US) > Example 261. <B730>: Assignee information. Identification of the assignee(s) associated with the document. Contains one or more of: an assignee identification and a corresponding assignee type. An end tag is required. Attribute(s): None Content model: <!ELEMENT B730 - - (B731,B732US)+ > Example 262. <B731>: Assignee. Name and address of the assignee(s) associated with the document. Contains the structure for identifying an individual or organization and associated address information. An end tag is required. Attribute(s): None Content model: <!ELEMENT B731 - - (PARTY-US)> Example 263. <B732US>: Assignee type (U.S. only). This element contains a two-digit code indicating the U.S. assignee. Contains parsable character data, custom characters, or revision markers. An end tag is required. Assignee types for U.S. patents are taken from the following table:

01 - Unassigned, 02 - United States company or corporation, 03 - Foreign company or corporation, 04 - United States individual, 05 - Foreign individual, 06 - U.S. Federal government, 07 - Foreign government, 08 - U.S. county government, 09 - U.S. state government. Attribute(s): None Content model: <!ELEMENT B732US - - (PDAT) > Example 264. <B740>: Attorney.

Identification of legal representation, that is, attorneys, agents, or representatives associated with the document. Contains one or more of attorney address. An end tag is required. For U.S. documents, legal representation may consist of a firm, a firm and one individual, a firm and two individuals, or up to three individuals. Attribute(s): None Content model: <!ELEMENT B740 - - (B741+) > Example 265. <B741>: Attorney address. Name and address of the attorney, agent, or representative associated with the document. Contains the structure for identifying an individual or organization and associated address information. An end tag is required. Attribute(s): None Content model: <!ELEMENT B741 - - (PARTY-US) > Example 266. <B745>: Persons acting upon the document. Identification of various persons acting upon the document. Contains a primary examiner, optional assistant examiner(s), and the examiner group. An end tag is required. Attribute(s): None Content model: <!ELEMENT B745 - - (B746,B747\*,B748US) > Example 267. <B746>: Primary examiner. Identification of the primary examiner associated with the document. Contains the structure for identifying an individual or organization and associated address information. An end tag is required. Attribute(s): None Content model: <!ELEMENT B746 - - (PARTY-US) > Example 268. <B747>: Assistant examiner.

Identification of the assistant examiner associated with the document. Contains the structure for identifying an individual or organization and associated address information. An end tag is required. Attribute(s): None Content model: <!ELEMENT B747 - - (PARTY-US) >

Example 269. <B748US>: Examiner group (U.S. only). The technology center, industry sector, art unit, or other grouping of U.S. patent examiners in which the application was examined. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B748US - - (PDAT) >

Example

International Conventions

270. <B800>: International conventions.

Data related to various international conventions other than the Paris Convention. Contains PCT filing information and an optional PCT or other regional authority application. Attribute(s): None

Content model: <!ELEMENT B800 - - (B860,B870?) > Example 271. <B830>: Microorganism.

Microorganism deposit information. Contains a deposit file number, the deposit authority (optional), and the date of deposit (optional). An end tag is required. Attribute(s): None Content model: <!ELEMENT B830 - - (B831,B832?,B833?) > Example 272. <B831>: Deposit file number. Microorganism deposit file number. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B831 - - (PDAT) > Example 273. <B832>: Deposit authority. Identification of the authority where the microorganism was deposited. Contains parsable character data, custom characters, or revision markers. An end tag is required. Attribute(s): None Content model: <!ELEMENT B832 - - (PDAT) > Example 274. <B833>: Date of deposit. Date of the deposit. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT B833 - - (DATE) > Example 275. <B860>: PCT filing information. Data related to filing an application via the PCT or a regional authority. Contains a PCT document identification, a 25 USC 371 date, and a 35 USC 102(e) date. An end tag is required. For U.S. documents, only PCT filings will be found in this element. Attribute(s): None Content model: <!ELEMENT B860 - - (B861,B863,B864) > Example 276. <B861>: PCT document identification. PCT document. Contains a document identification. An end tag is required. In the DOC structure, CTRY is always WO for a PCT document. Attribute(s): None Content model: <!ELEMENT B861 - - (DOC) > Example 277. <B863>: 35 USC 371 date. 35 USC 371 date, that is, PCT date. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT B863 - - (DATE) > Example 278. <B864>: 35 USC 102(e) date. 35 USC 102(e) date. Contains a date. An end tag is required. Attribute(s): None Content model: <!ELEMENT B864 - - (DATE) > Example 279. <B870>: PCT or regional authority publication information. PCT or regional authority publication information. Contains one published document. An end tag is required. Attribute(s): None Content model: <!ELEMENT B870 - - (B871) > Example 280. <B871>: Published document. PCT or regional authority published document identification. Contains the structure for document identification. An end tag is required. Attribute(s): None Content model: <!ELEMENT B871 - - (DOC) > Example 281. <PCIT>: Patent CITation. Citation or reference to a patent document. Contains a document number, any number of parties associated with the document, any number of international and national classifications, and a reference to a relevant section or page in the document (optional). An end tag is required. Attribute(s): None Content model: <!ELEMENT PCTI - - (DOC,PARTY-US\*,PIC\*,PNC\*,REL?) > Example

# Annex A: Red Book SGML Declaration for U.S. Patent Documents

document instances marked up in accord with the DTD contained in this specification.

<!SGML "ISO 8879:1986" CHARSET BASESET "ISO 646-1983//CHARSET International Reference Version (IRV)//ESC 2/5 4/0" DESCSET 0 9 UNUSED 9 2 9 11 2 UNUSED 13 1 13 14 18 UNUSED 32 95 32 127 1 UNUSED CAPACITY SGMLREF TOTALCAP 35000 SCOPE DOCUMENT SYNTAX SHUNCHAR CONTROLS 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 127 255 BASESET "ISO 646-1983//CHARSET International Reference Version (IRV)//ESC 2/5 4/0" DESCSET 0 128 0 FUNCTION RE 13 RS 10 SPACE 32 TAB SEPCHAR 9 NAMING LCNMSTRT "" UCNMSTRT "" LCNMCHAR "-." UCNMCHAR "-." NAMECASE GENERAL YES ENTITY NO DELIM GENERAL SGMLREF SHORTREF NONE NAMES SGMLREF QUANTITY SGMLREF ATTCNT 100 ATTSPLEN 960 BSEQLEN 960 -- UNUSED by WordPerfect for Windows 7 -- DTAGLEN 16 -- UNUSED by WordPerfect for Windows 7 -- DTEMPLEN 16 -- UNUSED by WordPerfect for Windows 7 -- ENTLVL 16 GRPCNT 256 GRPGTCNT 200 GRPLVL 16 LITLEN 2048 NAMELEN 32 NORMSEP 2 PILEN 240 TAGLEN 960 TAGLVL 24 FEATURES MINIMIZE DATATAG NO OMITTAG YES RANK NO SHORTTAG NO LINK SIMPLE NO IMPLICIT NO EXPLICIT NO OTHER CONCUR NO SUBDOC NO FORMAL YES APPINFO NONE >

# Annex B: Grant Red Book DTD

<!--DOCUMENT TYPE DEFINITION FOR UNITED STATES PUBLISHED PATENT DOCUMENTS, WIPO STANDARD ST.32/US/GRANT v1.7, 1999 JULY 29, USPTO-MODIFIED VERSION OF WIPO STANDARD ST.32 DTD. Reference this DTD as PUBLIC "-//USPTO//DTD ST.32 US PATENT GRANT V1.9 2000-03-07//EN". Contact: Bruce B. Cox, Office for Patent & Trademark Information, U.S. Patent and Trademark Office, Crystal Park 3, Suite 441, Washington, DC 20231, vox: 703-306-2606, fax: 703-306-2737, bruce.cox@uspto.gov. \*\*\*\*\*\*\*\*\*\* REVISION HISTORY \*\*\*\*\*\*\*\*\*\* Revised 2000-03-07, By JVN .. Element B580 changed from B582+,B583US\* to (B582|B583US)+ to allow for any order of structured or unstructured national classification .. Element F, added PTEXT to allow non-CWU in-line formula .. Element H, removed F (now part of STEXT) .. Element PAR, LVL attribute changed from (0 | 1 | 2 | 3 | 4 | 5) to (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7) in order to capture all known paragraph types. Reference mappings below: Blue Book: "+P ", Red Book: <PARA LVL="0"> PAR Blue Book: "+P0 ", Red Book: <PARA LVL="1">, Green Book: PA0; Blue Book: "+P1 ", Red Book: <PARA LVL="2">, Green Book: PA1; Blue Book: "+P2 ", Red Book: <PARA LVL="3">, Green Book: PA2; Blue Book: "+P3 ", Red Book: <PARA LVL="4">, Green Book: PA3; Blue Book: "+P4 ", Red Book: <PARA LVL="5">, Green Book: PA4 Blue Book: "+P5 ", Red Book: <PARA LVL="6">, Green Book: PA5; Blue Book: "+PS ", Red Book: <PARA LVL="7">, Green Book: PAL; Blue Book: "+PA ", Red Book: <PARA LVL="0">, Green Book: PAR (abstract paragraph - reference the SDOAB element); Blue Book: "+CL ", Red Book: <H LVL="1">, Green Book: PAC (centerline/header). .. Element PTEXT added F to allow non-CWU in-line formula .. Changed version number to 1.9 and date to 2000-03-07. Revised 1999 July 29, Bruce B. Cox ..changed version number to 1.7 ..added "mathentity" delcaration and invocation for MathML entity names

Revised 1999 July 12, Bruce B. Cox ..changed version number to 1.6 ..FILE ENTITY attribute changed to #REQUIRED everywhere except in PATDOC ..changed comment on B210 to reflect content change ..added attribute LVL to PARA with allowed values of 0, 1, 2, 3, 4, 5 ..added ? quantifier to SDOAB - Design patents have no abstract ..added ? quantifier to DETDESC - Plant patents have no detailed description ..added CUSTOM-CHARACTER empty element for image of non-ISO standard character ..changed PDAT content model from (#PCDATA | DEL-S | DEL-E | INS-S | INS-E) to ...(#PCDATA | DEL-S | DEL-E | INS-S | INS-E | CUSTOM-CHARACTER) ...do not use IMG for non-ISO standard characters ..added CLMSTEP for steps or elements of a claim ..changed CLM content model from (PTEXT | PARA)+ to (PTEXT | PARA | CLMSTEP)+ ..changed HIL content model from (LTL | SP | SB )+ to ...(LTL | SP | SB | BOLD | ITALIC | ULINE | DULINE | SMALLCAPS)\* ..changed LTL content model from (STEXT)+ to (PDAT) Revised 1999 June 10, Bruce B. Cox ..changed version number to 1.5 ..changed the comment to B522 to restrict this tag to official cross references..added B522US for unofficial cross references. Revised 1999 April 5, Bruce B. Cox ..changed version number to 1.4 ..added ISO-PUB and ISO-AMSA character sets ..added NOTATION declarations for TIF, MOL, CDX, and MAT. Revised 199 April 1, Bruce B. Cox..changed version number and date to v1.3, 1999 April 1. Revised 1999 March 23, Bruce B. Cox..corrected FOR content model from (STEXT) to EMPTY. Revised 1999 March 22, Bruce B. Cox ..corrected B580 model from (B581\* | B582+ | B583US\*) to (B581\*, B582+, B583US\*). Revised 1999 March 9, Bruce B. Cox..changed version number to 1.2..removed B450, B523, B862 - not needed in US documents...changed B400 model from (B450?,B472?) to (B472)...changed B520 model from (B521,(B522 | B523)\*) to (B521,B522\*)...changed B860 model from (B861,B862?,B863?,B864?) to (B861,B863?,B864?)..changed B561 model from (PDAT | PCIT) to (PCIT) - must use citation structure..changed B562 model from (PTEXT\* | NCIT) to (NCIT) - must use citation structure..changed B580 model from (B581 | B582 | B583US)+ to (B581\*, B582+, B583US\*)

... - repetitions within rather than of B580..changed B800 model from (B860?,B870?) to (B860,B870?) - element required..changed B860 model from (B861,B862?,B863?,B864?) to (B861,B863,B864) - PCT information required ..changed IMG model from (EMI | EMR | ELE | RTI | DEL-S | DEL-E | INS-S | INS-E)..................... to (EMI | EMR | ELE | RTI | DEL-S | DEL-E | INS-S | INS-E)+..changed NCIT model from (ARTCIT | BOOKCIT | DBASECIT | OTHCIT) to (STEXT)..removed ARTCIT, BOOKCIT, DBASECIT, OTHCIT, and all subordinate elements ... - complex structure no benefit to searching because of high probability of errors..added S300, S301, S302, S303, S304, S305, S306, S307, S308, S309, S313...to comply with ST.25 in absence of removed citation tags..changed S200 model from (S210,S211,S212,S-2-I?,S-2-II?,S-2-III?,S-2-IV?,S-2-V?,S213,S-2-VI?,S-2-VII?,S-2-VIII?,S220\*,CIT\*,S400)...................... to (S210,S211,S212,S-2-I?,S-2-II?,S-2-III?,S-2-IV?,S-2-V?,S213,S-2-VI?,S-2-VII?,S-2-VIII?,S220\*,S300\*,CIT\*,S400)..changed CIT model from (((DOC,B220,B140,NAM\*,PIC\*,PNC\*) | NCIT),REL\*)\*..................... to (((DOC,B220,B140,NAM\*,PIC\*,PNC\*) | NCIT),REL\*)+. Revised 1999 January 20, Bruce B. Cox..changed version number to 1.1..added IMG to PTEXT and STEXT models for character images..revised mechanism for changed text as follows:...removed CHG-S and CHG-E...added DEL-S, DEL-E, INS-S, INS-E...added those four tags to PDAT content model and a few other places...modified all #PCDATA-only content models to PDAT...(deleted/inserted text allowed anywhere but no inclusions per XML)...all branches of the tree terminate in PDAT!..in STEXT, replaced SB and SP with HIL..changed SDOCL model from (H|CL) to (H?,CL)..added PARACON and TITLES entities for CALSTabl..in SDODR, moved \* quantifier from EMI to the whole model..added + quantifier within both STEXT and PTEXT..added ? quantifier to B122US in B100 model..added \* quantifier to EMI in each CWU model; any one CWU may have multiple image files..changed ID attribute type from IDREF to ID for all external files referenced in a CWU..added ? quantifier to FNM..added PAREF, reference to a paragraph number. Revised 1998 December 8, Bruce B. Cox..moved LST out of CWU definition..changed P tag to PARA for CALS Table compatability..changed ELE content model from PTEXT to STEXT..added elements to SEQLST-US for old rules and embedded sequences..removed bib tags from SEQLST-US (redundant) and tags for data not captured ..added SEQREF to PTEXT ..replaced special image tags in all CWUs with EMI ..fixed CWU empty tag attributes to add external file entities. Revised 1998 December 4, Bruce B. Cox

..version number set to 1.0 ..revised to comply with the latest, extensive revisions to Red Book and ...XML 1.0 (except empty tags and UNICODE) consistent with SGML ..replaced CALS math with MathML which was modified to be SGML compliant. Revised 1998 November 20, Bruce B. Cox. Revised 1998 September 30, Bruce B. Cox. Note: this DTD was developed by the USPTO in August of 1997 to support ..the publishing of patent documents. It was derived from version 3.4 of the ..WIPO Standard ST.32 DTD. The original DTD was modified to handle only those ..elements used by the USPTO. It incorporates the CALS table and equation ..models, and handles graphics as external entities. The last revision ..occured on 03/09/1998.

\*\*\*\*\*\*\*\*\*\* END REVISION HISTORY \*\*\*\*\*\*\*\*\*\*

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<!--Document number.--> <!ELEMENT B110 - - (DNUM) > <!--Literal: "A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C.157." --> <!ELEMENT B122US - - (PDAT) > <!--Document kind code from WIPO Standard ST.16. For US documents: A = Utility Patent, Bx = Reexamination Certificate, where x is an integer (e.g., B1, B3), E = Reissue Patent, H = Statutory Invention Registration, P = Plant Patent, S = Design Patent--> <!ELEMENT B130 - - (PDAT) > <!--Document date (publication or issue).--> <!ELEMENT B140 - - (DATE) > <!--Publishing country or organization code from WIPO Standard ST.3.--> <!ELEMENT B190 - - (PDAT) > <!--Domestic filing data--> <!ELEMENT B200 - - (B210,B211US,B220,B221US?,B222US?) > <!--Application number

For US documents: SSnnnnnn (two-digit series code, six-digit serial number with leading zeros)--> <!ELEMENT B210 - - (DNUM) > <!--Series Code, two-digit, representing the following time periods and document types: 02 ... up to ...1947-12-31, 03 1948-01-01...1959-12-31, 04 1960-01-01...1969-12-31, 05 1970-01-01...1978-12-31, 06 1979-01-01...1986-12-31, 07 1987-01, 01...1992-12-31, 08 1993-01-01...1997-12-29, 09 1997-12-30...and after, 29 Design Application, 60 Provisional Application, 90 Reexamination Request--><!ELEMENT B211US - - (PDAT) > <!--Application filing date--><!ELEMENT B220 - - (DATE) > <!--When present, signifies that the application was filed under Rule 47, indicating the applicant(s) refused to execute the application or could not be found.--> <!ELEMENT B221US - O EMPTY > <!--When present, signifies the prosecution of the application includes the Continued Prosecution Application (CPA) procedure.--> <!ELEMENT B222US - O EMPTY > <!--Foreign priority data--> <!ELEMENT B300 - - (B310,B320,B330) > <!--Priority application number--> <!ELEMENT B310 - - (DNUM) > <!--Filing date of priority application.--> <!ELEMENT B320 - - (DATE) > <!--Publishing country or organization.--> <!ELEMENT B330 - - (CTRY) > <!--Public availability dates and term of protection--> <!ELEMENT B400 - - (B472) > <!--Term of grant.--> <!ELEMENT B472 - - (B473?,B473US?,B474?,B474US?) > <!--Disclaimer date--><!ELEMENT B473 - - (DATE) > <!--When present, this tag signifies that the patent is subject to a terminal

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<!--Reissue--><!ELEMENT B640 - - (PARENT-US) ><!--Divisional resissue information of a related US document--><!ELEMENT B641US - - (PARENT-US,SIBLING+) >

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CY CDATA #IMPLIED DNUM CDATA #IMPLIED DATE NMTOKEN #IMPLIED FILE CDATA #IMPLIED KIND CDATA #IMPLIED STATUS CDATA #IMPLIED DTD NMTOKEN #IMPLIED > <!--Post Office box number--><!ELEMENT PBOX - - (PDAT) ><!--Patent citation--><!ELEMENT PCIT - - (DOC,PARTY-US\*,PIC\*,PNC\*,REL?) ><!--Postal code or zip code--><!ELEMENT PCODE - - (PDAT) ><!--For compatability with XML (eliminates inclusions and unacceptable mixed content models). Terminal element of most branches.--><!ELEMENT PDAT - - (#PCDATA | DEL-S | DEL-E | INS-S | INS-E | CUSTOM-CHARACTER)\* ><!--Parent document identification--><!ELEMENT PDOC - - (DOC) ><!--International classification of citation (IPC).--><!ELEMENT PIC - - (PDAT) ><!--National classificaiton of citation--><!ELEMENT PNC - - (PDAT) ><!--id of patent associated with parent--><!ELEMENT PPUB - - (DOC) ><!--Parent status code. 00 ... Pending 01 ... Granted (Patent) 03 ... Abandoned 04 ... Statutory Invention Registration (SIR)--><!ELEMENT PSTA - - (PDAT) ><!--Contents of a paragraph--><!ELEMENT PTEXT - - (B830 | CIT | CLREF | CRF | CWU | DFREF | DNUM | F | FGREF | FOO | FOR | HIL | IMG | LST | LSTREF | PAREF | PDAT | SEQREF | TBLREF)+ ><!--Country of residence--><!ELEMENT RCTRY - - (CTRY) ><!--Identifies relevant spot in citation (page numbers, paragraph numbers, relevant residues (in sequence listing), etc.)--><!ELEMENT REL - - (STEXT+) ><!--Other Patent Relations--><!ELEMENT RELAPP - - (BTEXT) ><!--Inventor's residence.--><!ELEMENT RESIDENCE - - (MILS | (CITY,(STATE | CTRY))) ><!--Replace text with image--><!ELEMENT RTI - - (PDAT) ><!ATTLIST RTI ID ID #REQUIRED HE NMTOKEN #IMPLIED WI NMTOKEN #IMPLIED FILE ENTITY #REQUIRED LX NMTOKEN #IMPLIED LY NMTOKEN #IMPLIED IMF (ST33 | TIFF) #IMPLIED > <!--Computer readable form--><!ELEMENT S-1-V - - (S-1-V-A,S-1-V-B,S-1-V-C) ><!--Medium type Type of diskette/tape submitted--><!ELEMENT S-1-V-A - - (PDAT) ><!—Computer Type of computer used with diskette/tape submitted--><!ELEMENT S-1-V-B - - (PDAT) ><!--Operating system--><!ELEMENT S-1-V-C - - (PDAT) ><!--Sequence characteristics--><!ELEMENT S-2-I - - (S-2-I-C,S-2-I-D) ><!--Strandedness. If nucleic acid, number of strands of source organism molecule,

i.e., whether single stranded, double stranded, both, or unknown to applicant.--><!ELEMENT S-2-I-C - - (PDAT) ><!--Topology. Whether source organism molecule is circular, linear, both, or unknown to applicant.--><!ELEMENT S-2-I-D - - (PDAT) ><!--Molecule type: genomic RNA, genomic DNA, mRNA, tRNA, rRNA, snRNA, scRNA, preRNA, cDNA to genomic RNA, cDNA to mRNAcDNA to tRNA, cDNA to rRNA, cDNA to snRNA, cDNA to scRNA, other nucleic acid.

--><!ELEMENT S-2-II - - (S-2-II-A) ><!--Description (protein and peptide).--><!ELEMENT S-2-II-A - - (PDAT) ><!--Hypothetical? (yes, no)--><!ELEMENT S-2-III - - (PDAT) ><!--Anti-sense? (yes, no)--><!ELEMENT S-2-IV - - (PDAT) ><!--Method by which the sequence was identified: experiment, similarity with known sequence or to established consensus sequence or to some other pattern.--><!ELEMENT S-2-IX-C - - (PDAT) ><!--Gragment type. For proteins and peptides only, at least one of the following should be included in the sequence listing: N-terminal fragment, C-terminal fragment, and internal fragment.--><!ELEMENT S-2-V - - (PDAT) ><!--Original source of molecule.--><!ELEMENT S-2-VI - - (S-2-VI-B?,S-2-VI-C?,S-2-VI-D?,S-2-VI-E?,S-2-VI-F?,S-2-VI-G?,S-2-VI-H?,S-2-VI-I?) ><!--Strain--><!ELEMENT S-2-VI-B - - (PDAT) ><!--Individual isolate--><!ELEMENT S-2-VI-C - - (PDAT) ><!--Developmental stage. Give developmental stage of source organism and indicate whether derived from germ-line or rearranged developmental pattern.--><!ELEMENT S-2-VI-D - - (PDAT) ><!--Haplotype--><!ELEMENT S-2-VI-E - - (PDAT) ><!--Tissue type--><!ELEMENT S-2-VI-F - - (PDAT) ><!--Cell type--><!ELEMENT S-2-VI-G - - (PDAT) ><!--Cell line--><!ELEMENT S-2-VI-H - - (PDAT) ><!--Organelle--><!ELEMENT S-2-VI-I - - (PDAT) ><!ELEMENT S-2-VII - - (S-2-VII-A?,S-2-VII-B?) >

<!--Library (type and name)--><!ELEMENT S-2-VII-A - - (PDAT) ><!--Clone(s)--><!ELEMENT S-2-VII-B - - (PDAT) ><!--Position in genome--><!ELEMENT S-2-VIII - - (S-2-VIII-A?,S-2-VIII-B?,S-2-VIII-C?) ><!--Chromosome or segment name or number--><!ELEMENT S-2-VIII-A - - (PDAT) ><!--Map position--><!ELEMENT S-2-VIII-B - - (PDAT) ><!--Units for map position (genome percent, nucleotide number, etc.)--><!ELEMENT S-2-VIII-C - - (PDAT) ><!--Number of sequence IDs.--><!ELEMENT S160 - - (PDAT) ><!--Sequence information.--><!ELEMENT S200 - - (S210,S211,S212,S-2-I?,S-2-II?,S-2-III?,S-2-IV?,S-2-V?,S213,S-2-VI?,S-2-VII?,S-2-VIII?,S220\*,S300\*,CIT\*,S400) ><!--Sequence identification number.--><!ELEMENT S210 - - (PDAT) ><!--Number of bases or amino acid residues--><!ELEMENT S211 - - (PDAT) ><!--Presented sequence molecule is DNA or RNA or PRT (protein). If a nucleotide sequence contains both DNA and RNA fragments, the type shall be DNA. In addition, the combined DNA/RNA molecule shall be further described in S220, S221, S222, and S223.--><!ELEMENT S212 - - (PDAT) ><!--Organism's scientific name, i.e., genus/species, or 'unknown,' or 'artificial sequence.' If 'unknown' or 'artificial sequence,' describe further in S220, S221, S222, S223.--> <!ELEMENT S213 - - (PDAT) ><!--Sequence feature; description a point of bilological significance in the sequence.--><!ELEMENT S220 - - (S221,S222,S-2-IX-C?,S223) ><!- Name/Key. Appropriate identifier for this feature, preferably from WIPO Standard ST.25 (1998), Appendix 2, tables 5 and 6.--><!ELEMENT S221 - - (STEXT+) ><!--Location of the feature within the sequence. Where appropraite, state the number of the first and last bases/amino acids in the feature. Old rules: specify location according to syntax of DDBJ, EMBL, or GenBank feature tables definition, including whether feature is on complement of presented sequence; where appropriate, state number of first and last bases/amino acids in feature.--><!ELEMENT S222 - - (STEXT+) ><!--Other relevant information. Limited to approximately 288 characters of text.--><!ELEMENT S223 - - (STEXT+) ><!--Publication information-->

<!ELEMENT S300 - -(S301?,S302?,S303?,S304?,S305?,S306?,S307?,S308?,S309?,S313?)><!--Authors--><!ELEMENT S301 - - (PARTY-US+) ><!--Title--><!ELEMENT S302 - - (PDAT) ><!--Journal--><!ELEMENT S303 - - (PDAT) ><!--Volume--><!ELEMENT S304 - - (PDAT) ><!--Issue--><!ELEMENT S305 - - (PDAT) ><!--Pages--><!ELEMENT S306 - - (PDAT) ><!--Date of publication of the journal. If date is available as YYYY-MM-DD, use DATE element. Otherwise, use PDAT.--><!ELEMENT S307 - - (DATE,PDAT) ><!--Database accession number. Accession number assigned by database including database name.--><!ELEMENT S308 - - (PDAT) >

<!--Database entry date--><!ELEMENT S309 - - (DATE) ><!--Relevant residues--><!ELEMENT S313 - - (PDAT) ><!--The sequence itself.--><!ELEMENT S400 - - (PDAT) ><!--Subscript--><!ELEMENT SB - - (PDAT | HIL)\* ><!--Subdocument: Abstract. All US patent types have an abstract; for a Design patent, the abstract consists of a drawing only.--><!ELEMENT SDOAB - - (BTEXT) ><!--la = language (ISO 639) cy = country code (WIPO Standard ST.3) status = Status of the sub-doc.--><!ATTLIST SDOAB LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED

STATUS CDATA #IMPLIED ><!--Subdocument: Bibliographic information.--><!ELEMENT SDOBI - - (B100,B200,B300\*,B400?,B500,B600?,B700,B800?) ><!--la = language (ISO 639) cy = country code (WIPO Standard ST.3) status = Status of the sub-doc.--><!ATTLIST SDOBI LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED ><!--Divisional reissue sibling application--><!ELEMENT SDOC - - (DOC) ><!--Subdocument: Claims-->

<!ELEMENT SDOCL - - (H?,CL) ><!--la = language (ISO 639) cy = country code (WIPO Standard ST.3) status = Status of the sub-doc.--><!ATTLIST SDOCL LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED ><!--Subdocument: OCR (optical character recognition) of first-page (bibliographic information) contents. Where OCR failed to associate all content with elements, the entire first page text is included in this element. Appears only in those US documents which have been subjected to OCR processing.--><!ELEMENT SDOCR - - (PDAT) ><!--la = language (ISO 639) cy = country code (WIPO Standard ST.3) status = Status of the sub-doc.--><!ATTLIST SDOCR LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED > <!--Subdocument: Description of the invention.--> <!ELEMENT SDODE - - (RELAPP?,GOVINT?,BRFSUM?,DRWDESC?,DETDESC?) >

<!--la = language (ISO 639) cy = country code (WIPO Standard ST.3) status = Status of the sub-doc.--><!ATTLIST SDODE LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED

STATUS CDATA #IMPLIED ><!--Subdocument: Drawings--><!ELEMENT SDODR - - (EMI | DEL-S | DEL-E | INS-S | INS-E)\* ><!--la = language (ISO 639) cy = country code (WIPO Standard ST.3) status = Status of the sub-doc.--><!ATTLIST SDODR LA NMTOKEN #IMPLIED CY NMTOKEN #IMPLIED STATUS CDATA #IMPLIED ><!--Sequence listing embedded in other text.--><!ELEMENT SEQ-EMBD - - (PDAT) ><!--Sequence Listing. The following table shows the ST.25 Identifier followed by the corresponding Red-Book tag: Bxxx elements are in SDOBI. ST.25 Identifier: 110, Red-Book tag: B720; ST.25 Identifier: 120, Red-Book tag: B540;

ST.25 Identifier: 130, Red-Book tag: S130; ST.25 Identifier: 140, Red-Book tag: B210; ST.25 Identifier: 141, Red-Book tag: B220; ST.25 Identifier: 150, Red-Book tag: B310; ST.25 Identifier: 151, Red-Book tag: B320; ST.25 Identifier: 160, Red-Book tag: S160; ST.25 Identifier: 170, Red-Book tag: S170; ST.25 Identifier: N/A, Red-Book tag: S200 (container for S2xx tags; not in ST.25); ST.25 Identifier: 210, Red-Book tag: S210; ST.25 Identifier: 211, Red-Book tag: S211; ST.25 Identifier: 212, Red-Book tag: S212; ST.25 Identifier: 213, Red-Book tag: S213; ST.25 Identifier: 220, Red-Book tag: S220; ST.25 Identifier: 221, Red-Book tag: S221; ST.25 Identifier: 222, Red-Book tag: S222; ST.25 Identifier: 223, Red-Book tag: S223; ST.25 Identifier: 300, Red-Book tag: S300; ST.25 Identifier: 301, Red-Book tag: S301; ST.25 Identifier: 302, Red-Book tag: S302; ST.25 Identifier: 303, Red-Book tag: S303; ST.25 Identifier: 304, Red-Book tag: S304; ST.25 Identifier: 305, Red-Book tag: S305; ST.25 Identifier: 306, Red-Book tag: S306; ST.25 Identifier: 307, Red-Book tag: S307; ST.25 Identifier: 308, Red-Book tag: S308; ST.25 Identifier: 309, Red-Book tag: S309; ST.25 Identifier: 310, Red-Book tag: DNUM; ST.25 Identifier: 311, Red-Book tag: B220; ST.25 Identifier: 312, Red-Book tag: B140; ST.25 Identifier: 313, Red-Book tag: S313; ST.25 Identifier: 400, Red-Book tag: S400. The following table shows the pre-ST.25 tags for which there is no corresponding ST.25 tag followed by the corresponding Red-Book tag. Pre-ST.25 tag: (1)(v), Red-Book tag: S-1-V; Pre-ST.25 tag:

(1)(v)(A), Red-Book tag: S-1-V-A; Pre-ST.25 tag: (1)(v)(B), Red-Book tag: S-1-V-B; Pre-ST.25 tag: (1)(v)(C), Red- Book tag: S-1-V-C; Pre-ST.25 tag: (2)(i), Red-Book tag: S-2-I; Pre-ST.25 tag: (2)(i)(C), Red-Book tag: S-2-I-C; Pre-ST.25 tag: (2)(i)(D), Red-Book tag: S-2-I-D; Pre-ST.25 tag: (2)(ii), Red-Book tag: S-2-II, Pre-ST.25 tag: (2)(ii)(A), Red-Book tag: S-2-II-A; Pre-ST.25 tag: (2)(iii), Red-Book tag: S-2-III; Pre-ST.25 tag: (2)(iv), Red-Book tag: S-2-IV; Pre-ST.25 tag:

(2)(v), Red-Book tag: S-2-V; Pre-ST.25 tag: (2)(vi)(B), Red-Book tag: S-2-VI-B; Pre-ST.25 tag: (2)(vi)(C), Red-Book tag: S-2-VI-B; Pre-ST.25 tag: (2)(vi)(D), Red-Book tag: S-2-VI-D; Pre-ST.25 tag: (2)(vi)(E), Red-Book tag: S-2-VI-E; Pre-ST.25 tag: (2)(vi)(F), Red-Book tag: S-2-VI-F; Pre-ST.25 tag: (2)(vi)(G), Red-Book tag: S-2-VI-G; Pre-ST.25 tag: (2)(vi)(H), Red-Book tag: S-2-VI-H; Pre-ST.25 tag: (2)(vi)(I), Red-Book tag: S-2-VI-I; Pre-ST.25 tag: (2)(vii), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(vii)(A), Red-Book tag: S-2-VII-A; Pre-ST.25 tag: (2)(vii)(B), Red-Book tag: S-2-VII-B; Pre-ST.25 tag: (2)(viii), Red-Book tag: S-2-VIII; Pre-ST.25 tag: (2)(viii)(A), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(viii)(B), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(viii)(C), Red-Book tag: S-2-VII; Pre-ST.25 tag: (2)(ix)(C), Red-Book tag: S-2-IX-C. --><!ELEMENT SEQ-LST - - (S160,S-1-V?,S200+) ><!--Sequence Listing--><!ELEMENT SEQLST-US - - ((SEQ-LST,EMI\*) | (SEQ-EMBD,EMI\*)) ><!ATTLIST SEQLST-US ID ID #REQUIRED ><!--Reference to a sequence listing.--><!ELEMENT SEQREF - O EMPTY ><!ATTLIST SEQREF ID IDREF #REQUIRED ><!--Suffix (e.g., II, Jr., Esq. et al.)--> <!ELEMENT SFX - - (PDAT) ><!--Divisional reissue siblings--><!ELEMENT SIBLING - - (CDOC,SDOC,SPUB) ><!--List, Simple--><!ELEMENT SL - - (LI+) ><!--compact = Spacing between items level = Nesting level of list--><!ATTLIST SL COMPACT (COMPACT) #IMPLIED LEVEL NMTOKEN #IMPLIED ><!ELEMENT SMALLCAPS - - (PDAT | HIL)\* ><!--Family, last, surname or organisation--><!ELEMENT SNM - - (STEXT+) ><!--Superscript--><!ELEMENT SP - - (PDAT | HIL)\* ><!--Divisional reissue sibling patent--><!ELEMENT SPUB - - (DOC) ><!--Region of country (state, province)--><!ELEMENT STATE - - (PDAT) ><!--Text including subscripts and superscripts.--><!ELEMENT STEXT - - (PDAT | F | FOR | IMG | HIL)+ ><!--Street, house number or house name--><!ELEMENT STR - - (PDAT) ><!--Synonym or cross reference--><!ELEMENT SYN - - (PDAT) ><!--Table in CALS markup--><!ELEMENT TABLE-CALS - - (TABLE) ><!--Table--><!ELEMENT TABLE-US - - (TABLE-CALS,EMI\*) ><!ATTLIST TABLE-US ID ID #REQUIRED > <!--Reference to a table.--><!ELEMENT TBLREF - O EMPTY ><!--Table reference(s)--><!ATTLIST TBLREF ID IDREFS #IMPLIED ><!--Telephone number--><!ELEMENT TEL - - (PDAT) ><!--Title (e.g., Mr., Mrs.) applied to a name--><!ELEMENT TTL - - (PDAT) ><!--List, Unordered--><!ELEMENT UL - - (LI+) ><!--st = Ulist symbol level = Nesting level of list compact = Spacing between items--><!ATTLIST UL ST CDATA #REQUIRED LEVEL NMTOKEN #IMPLIED COMPACT (COMPACT) #IMPLIED ><!--Underline--><!ELEMENT ULINE - - (PDAT | HIL)\* ><!-- ]> -->

# Annex C: MathML DTD as Modified for Grant Red Book

<!-- Content model for content and presentation --><!-- and browser interface tags in MathML --><!-- initial draft 9.May.1997 syntax = XML --><!-- author = s.buswell sb@stilo.demon.co.uk -->

<!-- --><!-- revised 14.May.1997 by Robert Miner --><!-- revised 29.June.1997 and 2.July.1997 by s.buswell --><!-- --><!-- revised 15.December.1997 by s.buswell --><!-- revised 8.February.1998 by s.buswell --><!-- revised 4.april.1998 by s.buswell --><!-- --><!-- W3C Recommendation 7 April 1998 --><!-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* --><!-- general attribute definitions for class & style & id & other --><!-- : attributes shared by all mathml elements --><!ENTITY % att-globalatts 'class CDATA #IMPLIED style CDATA #IMPLIED id ID #IMPLIED other CDATA #IMPLIED' ><!-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* --><!-- Presentation element set --><!-- presentation attribute definitions --><!ENTITY % att-fontsize 'fontsize CDATA #IMPLIED' ><!ENTITY % att-fontweight 'fontweight (fwnormal | bold) #IMPLIED' ><!ENTITY % att-fontstyle 'fontstyle (fsnormal | italic) #IMPLIED' ><!ENTITY % att-fontfamily 'fontfamily CDATA #IMPLIED' ><!ENTITY % att-color 'color CDATA #IMPLIED' ><!ENTITY % att-fontinfo '%att-fontsize; %att-fontweight; %att-fontstyle; %att-fontfamily;

%att-color;' ><!ENTITY % att-form 'form (prefix | infix | postfix) #IMPLIED' > <!ENTITY % att-fence 'fence (aftrue | affalse ) #IMPLIED' ><!ENTITY % att-separator 'separator (true | false ) #IMPLIED' ><!ENTITY % att-lspace 'lspace CDATA #IMPLIED' ><!ENTITY % att-rspace 'rspace CDATA #IMPLIED' ><!ENTITY % att-stretchy 'stretchy (astrue | asfalse ) #IMPLIED' ><!ENTITY % att-symmetric 'symmetric (aytrue | ayfalse ) #IMPLIED' ><!ENTITY % att-maxsize 'maxsize CDATA #IMPLIED' ><!ENTITY % att-minsize 'minsize CDATA #IMPLIED' ><!ENTITY % att-largeop 'largeop (altrue | alfalse ) #IMPLIED' ><!ENTITY % att-movablelimits 'movablelimits (amtrue | amfalse ) #IMPLIED' ><!ENTITY % att-accent 'accent (aatrue | aafalse) #IMPLIED'>

<!ENTITY % att-opinfo '%att-form; %att-fence;%att-separator;%att-lspace;%att-rspace;%att-stretchy;%att-symmetric;%att-maxsize; %att-minsize; %att-largeop; %att-movablelimits; %att-accent;' ><!ENTITY % att-width 'width CDATA #IMPLIED' ><!ENTITY % att-height 'height CDATA #IMPLIED' ><!ENTITY % att-depth 'depth CDATA #IMPLIED' ><!ENTITY % att-sizeinfo '%att-width;%att-height;%att-depth;' ><!ENTITY % att-lquote 'lquote CDATA #IMPLIED' ><!ENTITY % att-rquote 'rquote CDATA #IMPLIED' ><!ENTITY % att-linethickness 'linethickness CDATA #IMPLIED' ><!ENTITY % att-scriptlevel 'scriptlevel CDATA #IMPLIED'><!ENTITY % att-displaystyle 'displaystyle (dstrue | dsfalse) #IMPLIED'><!ENTITY % att-scriptsizemultiplier 'scriptsizemultiplier CDATA #IMPLIED' ><!ENTITY % att-scriptminsize 'scriptminsize CDATA #IMPLIED'><!ENTITY % att-background 'background CDATA #IMPLIED' ><!ENTITY % att-open 'open CDATA #IMPLIED' ><!ENTITY % att-close 'close CDATA #IMPLIED' ><!ENTITY % att-separators 'separators CDATA #IMPLIED' ><!ENTITY % att-subscriptshift 'subscriptshift CDATA #IMPLIED'><!ENTITY % att-superscriptshift 'superscriptshift CDATA #IMPLIED' ><!ENTITY % att-accentunder 'accentunder (aaytrue | aayfalse) #IMPLIED'><!ENTITY % att-align 'align CDATA #IMPLIED' ><!ENTITY % att-rowalign 'rowalign CDATA #IMPLIED' ><!ENTITY % att-columnalign 'columnalign CDATA #IMPLIED' ><!ENTITY % att-groupalign 'groupalign CDATA #IMPLIED' ><!ENTITY % att-alignmentscope 'alignmentscope CDATA #IMPLIED' ><!ENTITY % att-rowspacing 'rowspacing CDATA #IMPLIED' ><!ENTITY % att-columnspacing 'columnspacing CDATA #IMPLIED' ><!ENTITY % att-rowlines 'rowlines CDATA #IMPLIED' ><!ENTITY % att-columnlines 'columnlines CDATA #IMPLIED' ><!ENTITY % att-frame 'frame (none | solid | dashed) #IMPLIED' ><!ENTITY % att-framespacing 'framespacing CDATA #IMPLIED' ><!ENTITY % att-equalrows 'equalrows CDATA #IMPLIED' ><!ENTITY % att-equalcolumns 'equalcolumns CDATA #IMPLIED' ><!ENTITY % att-tableinfo '%att-align; %att-rowalign; %att-columnalign; %att-groupalign; %att-alignmentscope; %att-rowspacing; %att-columnspacing; %att-rowlines; %att-columnlines; %att-frame; %att-framespacing; %att-equalrows; %att-equalcolumns; %att-displaystyle;' <!ENTITY % att-columnspan 'columnspan CDATA #IMPLIED' ><!ENTITY % att-edge 'edge (left | right) #IMPLIED ' ><!ENTITY % att-actiontype 'actiontype CDATA #IMPLIED' ><!ENTITY % att-selection 'selection CDATA #IMPLIED ' ><!-- presentation token schemata with content--><!ENTITY % ptoken "mi | mn | mo | mtext | ms" ><!ATTLIST mi %att-fontinfo; %att-globalatts; ><!ATTLIST mn %att-fontinfo; %att-globalatts; > <!ATTLIST mo %att-fontinfo;%att-opinfo;%att-globalatts; ><!ATTLIST mtext %att-fontinfo;%att-globalatts; ><!ATTLIST ms %att-fontinfo;%att-lquote;%att-rquote;%att-globalatts; ><!-- empty presentation token schemata --><!ENTITY % petoken "mspace" ><!ELEMENT mspace - o EMPTY ><!ATTLIST mspace %att-sizeinfo;

%att-globalatts; ><!-- presentation general layout schemata --><!ENTITY % pgenschema "mrow|mfrac|msqrt|mroot| mstyle|merror|mpadded| mphantom|mfenced" ><!ATTLIST mrow %att-globalatts; ><!ATTLIST mfrac %att-linethickness; %att-globalatts; ><!ATTLIST msqrt %att-globalatts; ><!ATTLIST mroot %att-globalatts; ><!ATTLIST mstyle %att-fontinfo;%att-opinfo; %att-lquote; %att-rquote; %att-linethickness; %att-scriptlevel; %att-scriptsizemultiplier; %att-scriptminsize; %att-background; %att-open; %att-close; %att-separators; %att-subscriptshift; %att-superscriptshift; %att-accentunder; %att-tableinfo; %att-rowspan; %att-columnspan; %att-edge; %att-actiontype; %att-selection; %att-globalatts; ><!ATTLIST merror %att-globalatts; ><!ATTLIST mpadded %att-sizeinfo; %att-lspace; %att-globalatts; > <!ATTLIST mphantom %att-globalatts; > <!ATTLIST mfenced %att-open; %att-close; %att-separators; %att-globalatts; ><!-- presentation layout schemata : scripts and limits --> <!ENTITY % pscrschema "msub|msup|msubsup| munder|mover|munderover|mmultiscripts" > <!ATTLIST msub %att-subscriptshift; %att-globalatts; > <!ATTLIST msup %att-superscriptshift; %att-globalatts; > <!ATTLIST msubsup %att-subscriptshift; %att-superscriptshift; %att-globalatts; ><!ATTLIST munder %att-accentunder; %att-globalatts; > <!ATTLIST mover %att-accent; %att-globalatts; > <!ATTLIST munderover %att-accent; %att-accentunder; %att-globalatts; > <!ATTLIST mmultiscripts %att-subscriptshift; %att-superscriptshift; %att-globalatts; ><!-- presentation layout schemata: script empty elements --><!ENTITY % pscreschema "mprescripts|none" ><!ELEMENT mprescripts - o EMPTY ><!ATTLIST mprescripts %att-globalatts; ><!ELEMENT none - o EMPTY ><!ATTLIST none %att-globalatts; ><!-- presentation layout schemata: tables --><!ENTITY % ptabschema "mtable|mtr|mtd" > <!ATTLIST mtable %att-tableinfo; %att-globalatts; ><!ATTLIST mtr %att-rowalign;%att-columnalign;%att-groupalign;%att-globalatts; ><!ATTLIST mtd %att-rowalign; %att-columnalign; %att-groupalign; %att-rowspan; %att-columnspan; %att-globalatts; ><!ENTITY % plschema "%pgenschema;|%pscrschema;|%ptabschema;" > <!-- empty presentation layout schemata --> <!ENTITY % peschema "maligngroup | malignmark" ><!ELEMENT malignmark - o EMPTY > <!ATTLIST malignmark %att-edge; %att-globalatts; ><!ELEMENT maligngroup - o EMPTY >

<!ATTLIST maligngroup %att-groupalign; %att-globalatts; > <!-- presentation action schemata --> <!ENTITY % pactions "maction" ><!ATTLIST maction %att-actiontype; %att-selection; %att-globalatts; > <!-- Presentation entity for substitution into content tag constructs --> <!-- excludes elements which are not valid as expressions --> <!ENTITY % PresInCont "%ptoken; | %petoken; | %plschema; | %peschema; | %pactions;"> <!-- Presentation entity - all presentation constructs --> <!ENTITY % Presentation "%ptoken; | %petoken; | %pscreschema; | %plschema; | %peschema; | %pactions;"> <!-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* --> <!-- Content element set --><!-- attribute definitions --><!ENTITY % att-base 'base CDATA "10"' ><!ENTITY % att-closure 'closure CDATA "closed"' ><!ENTITY % att-definition 'definitionURL CDATA ""' ><!ENTITY % att-encoding 'encoding CDATA ""' ><!ENTITY % att-nargs 'nargs CDATA "1"' ><!ENTITY % att-occurence 'occurence CDATA "function-model"' ><!ENTITY % att-order 'order CDATA "numeric"' ><!ENTITY % att-scope 'scope CDATA "local"' ><!ENTITY % att-type 'type CDATA #IMPLIED' ><!-- content leaf token elements --><!ENTITY % ctoken "ci | cn" ><!ATTLIST ci %att-type;%att-globalatts; ><!ATTLIST cn %att-type;%att-base;%att-globalatts; ><!-- content elements - specials --><!ENTITY % cspecial "apply | reln | lambda" ><!ATTLIST apply %att-globalatts; ><!ATTLIST reln %att-globalatts; ><!ATTLIST lambda %att-globalatts; >

<!-- content elements - others --><!ENTITY % cother "condition | declare | sep" ><!ATTLIST condition %att-globalatts; ><!ATTLIST declare %att-type;%att-scope;%att-nargs;%att-occurence;%att-definition;%att-globalatts; ><!ELEMENT sep - o EMPTY ><!ATTLIST sep %att-globalatts; ><!-- content elements - semantic mapping --><!ENTITY % csemantics "semantics | annotation | annotation-xml" ><!ATTLIST semantics %att-definition;

%att-globalatts; ><!ATTLIST annotation %att-encoding;%att-globalatts; ><!ATTLIST annotation-xml %att-encoding;%att-globalatts; ><!-- content elements - constructors --><!ENTITY % cconstructor "interval | list | matrix | matrixrow | set | vector" ><!ATTLIST interval %att-closure;

%att-globalatts; ><!ATTLIST set %att-globalatts; ><!ATTLIST list %att-order;%att-globalatts; ><!ATTLIST vector %att-globalatts; ><!ATTLIST matrix %att-globalatts; ><!ATTLIST matrixrow %att-globalatts; ><!-- content elements - operators --> <!ENTITY % cfuncop1ary "inverse | ident " ><!ELEMENT inverse - o EMPTY ><!ATTLIST inverse %att-definition; %att-globalatts; > <!ENTITY % cfuncopnary "fn | compose" > <!ATTLIST fn %att-definition; %att-globalatts; > <!ELEMENT ident - o EMPTY ><!ATTLIST ident %att-definition; %att-globalatts; ><!ELEMENT compose - o EMPTY ><!ATTLIST compose %att-definition; %att-globalatts; ><!ENTITY % carithop1ary "abs | conjugate | exp | factorial" ><!ELEMENT exp - o EMPTY ><!ATTLIST exp %att-definition; %att-globalatts; ><!ELEMENT abs - o EMPTY ><!ATTLIST abs %att-definition;

%att-globalatts; ><!ELEMENT conjugate - o EMPTY ><!ATTLIST conjugate %att-definition; %att-globalatts; ><!ELEMENT factorial - o EMPTY ><!ATTLIST factorial %att-definition; %att-globalatts; ><!ENTITY % carithop1or2ary "minus" ><!ELEMENT minus - o EMPTY ><!ATTLIST minus %att-definition;%att-globalatts; ><!ENTITY % carithop2ary "quotient | divide | power | rem" ><!ELEMENT quotient - o EMPTY ><!ATTLIST quotient %att-definition; %att-globalatts; > <!ELEMENT divide - o EMPTY ><!ATTLIST divide %att-definition; %att-globalatts; > <!ELEMENT power - o EMPTY ><!ATTLIST power %att-definition; %att-globalatts; > <!ELEMENT rem - o EMPTY ><!ATTLIST rem %att-definition; %att-globalatts; ><!ENTITY % carithopnary "plus | times | max | min | gcd" ><!ELEMENT plus - o EMPTY ><!ATTLIST plus %att-definition; %att-globalatts; ><!ELEMENT max - o EMPTY ><!ATTLIST max %att-definition;

%att-globalatts; ><!ELEMENT min - o EMPTY ><!ATTLIST min %att-definition; %att-globalatts; ><!ELEMENT times - o EMPTY ><!ATTLIST times %att-definition; %att-globalatts; ><!ELEMENT gcd - o EMPTY ><!ATTLIST gcd %att-definition; %att-globalatts; ><!ENTITY % carithoproot "root" ><!ELEMENT root - o EMPTY ><!ATTLIST root %att-definition; %att-globalatts; ><!ENTITY % clogicopquant "exists | forall" ><!ELEMENT exists - o EMPTY ><!ATTLIST exists %att-definition; %att-globalatts; ><!ELEMENT forall - o EMPTY ><!ATTLIST forall %att-definition; %att-globalatts; ><!ENTITY % clogicopnary "and | or | xor" ><!ELEMENT and - o EMPTY ><!ATTLIST and %att-definition; %att-globalatts; ><!ELEMENT or - o EMPTY > <!ATTLIST or %att-definition; %att-globalatts; ><!ELEMENT xor - o EMPTY ><!ATTLIST xor %att-definition; %att-globalatts; ><!ENTITY % clogicop1ary "not" ><!ELEMENT not - o EMPTY ><!ATTLIST not %att-definition; %att-globalatts; ><!ENTITY % clogicop2ary "implies" ><!ELEMENT implies - o EMPTY ><!ATTLIST implies %att-definition; %att-globalatts; ><!ENTITY % ccalcop "log | int | diff | partialdiff" ><!ELEMENT log - o EMPTY ><!ATTLIST log %att-definition; %att-globalatts; ><!ELEMENT int - o EMPTY ><!ATTLIST int %att-definition; %att-globalatts; ><!ELEMENT diff - o EMPTY ><!ATTLIST diff %att-definition; %att-globalatts; > <!ELEMENT partialdiff - o EMPTY > <!ATTLIST partialdiff %att-definition; %att-globalatts; > <!ENTITY % ccalcop1ary "ln" ><!ELEMENT ln - o EMPTY ><!ATTLIST ln %att-definition; %att-globalatts; ><!ENTITY % csetop2ary "setdiff" ><!ELEMENT setdiff - o EMPTY ><!ATTLIST setdiff %att-definition; %att-globalatts; ><!ENTITY % csetopnary "union | intersect" > <!ELEMENT union - o EMPTY ><!ATTLIST union %att-definition; %att-globalatts; ><!ELEMENT intersect - o EMPTY ><!ATTLIST intersect %att-definition; %att-globalatts; ><!ENTITY % cseqop "sum | product | limit" ><!ELEMENT sum - o EMPTY > <!ATTLIST sum %att-definition;

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%att-globalatts; ><!ELEMENT limit - o EMPTY ><!ATTLIST limit %att-definition;

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| %csetrel2ary; | %cseqrel2ary; " ><!ENTITY % crelnary "%cgenrelnary; | %csetrelnary;" ><!-- content constructs - all --><!ENTITY % Content "%ctoken; | %cspecial; | %cother; | %csemantics; |%cconstructor; | %cquantifier; |%cop1ary; |%cop2ary; |%copnary; |%copmisc; |%crel2ary; |%crelnary;" ><!-- content constructs for substitution in presentation structures --><!ENTITY % ContInPres "ci | cn | apply | fn | lambda | reln | interval | list | matrix |matrixrow | set | vector | semantics" > <!--dpc--> <!-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* --><!-- recursive definition for content of expressions --><!-- include presentation tag constructs at lowest level --><!-- so presentation layout schemata hold presentation or Content --><!-- include Content tag constructs at lowest level --><!-- so Content tokens hold PCDATA or Presentation at leaf level --><!-- (for permitted substitutable elements in context) --><!ENTITY % ContentExpression "(%Content; | %PresInCont;)\* " ><!ENTITY % PresExpression "(%Presentation; | %ContInPres;)\* " ><!ENTITY % MathExpression "(%PresInCont; | %ContInPres;)\* " ><!-- content token elements (may hold embedded presentation constructs)--><!ELEMENT ci - - (#PCDATA | %PresInCont;)\* ><!ELEMENT cn - - (#PCDATA | sep | %PresInCont;)\* ><!-- content special elements --><!ELEMENT apply - - (%ContentExpression;) ><!ELEMENT reln - - (%ContentExpression;) ><!ELEMENT lambda - - (%ContentExpression;) ><!-- content other elements --><!ELEMENT condition - - (%ContentExpression;) ><!ELEMENT declare - - (%ContentExpression;) ><!-- content semantics elements --><!ELEMENT semantics - - (%ContentExpression;) ><!ELEMENT annotation - - (#PCDATA) ><!ELEMENT annotation-xml - - (%ContentExpression;) ><!-- content constructor elements --><!ELEMENT interval - - (%ContentExpression;) ><!ELEMENT set - - (%ContentExpression;) ><!ELEMENT list - - (%ContentExpression;) ><!ELEMENT vector - - (%ContentExpression;) ><!ELEMENT matrix - - (%ContentExpression;) ><!ELEMENT matrixrow - - (%ContentExpression;) ><!-- content operator element (user-defined) --><!ELEMENT fn - - (%ContentExpression;) ><!-- content quantifier elements --><!ELEMENT lowlimit - - (%ContentExpression;) ><!ELEMENT uplimit - - (%ContentExpression;) ><!ELEMENT bvar - - (%ContentExpression;) ><!ELEMENT degree - - (%ContentExpression;) ><!ELEMENT logbase - - (%ContentExpression;) ><!--\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* --><!-- presentation layout schema contain tokens, layout and content schema --><!ELEMENT mstyle - - (%PresExpression;) ><!ELEMENT merror - - (%PresExpression;) > <!ELEMENT mphantom - - (%PresExpression;) ><!ELEMENT mrow - - (%PresExpression;) ><!ELEMENT mfrac - - (%PresExpression;) ><!ELEMENT msqrt - - (%PresExpression;) ><!ELEMENT mroot - - (%PresExpression;) ><!ELEMENT msub - - (%PresExpression;) ><!ELEMENT msup - - (%PresExpression;) ><!ELEMENT msubsup - - (%PresExpression;) ><!ELEMENT mmultiscripts - - (%PresExpression;) ><!ELEMENT munder - - (%PresExpression;) ><!ELEMENT mover - - (%PresExpression;) ><!ELEMENT munderover - - (%PresExpression;) ><!ELEMENT mtable - - (%PresExpression;) ><!ELEMENT mtr - - (%PresExpression;) ><!ELEMENT mtd - - (%PresExpression;) ><!ELEMENT maction - - (%PresExpression;) ><!ELEMENT mfenced - - (%PresExpression;) ><!ELEMENT mpadded - - (%PresExpression;) ><!-- presentation tokens contain PCDATA or malignmark constructs --><!ELEMENT mi - - (#PCDATA | malignmark )\* ><!ELEMENT mn - - (#PCDATA | malignmark )\* ><!ELEMENT mo - - (#PCDATA | malignmark )\* ><!ELEMENT mtext - - (#PCDATA | malignmark )\* ><!ELEMENT ms - - (#PCDATA | malignmark )\* ><!-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* --><!-- browser interface definition --><!-- attributes for top level math element --><!ENTITY % att-macros 'macros CDATA #IMPLIED' ><!ENTITY % att-mode 'mode CDATA #IMPLIED' ><!ENTITY % att-topinfo '%att-globalatts; %att-macros;

%att-mode;' ><!-- attributes for browser interface element element --><!ENTITY % att-name 'name CDATA #IMPLIED' ><!ENTITY % att-height 'height CDATA #IMPLIED' ><!ENTITY % att-width 'width CDATA #IMPLIED' ><!ENTITY % att-baseline 'baseline CDATA #IMPLIED' ><!ENTITY % att-overflow 'overflow (scroll|elide|truncate|scale) "scroll"' ><!ENTITY % att-altimg 'altimg CDATA #IMPLIED' ><!ENTITY % att-alttext 'alttext CDATA #IMPLIED' ><!ENTITY % att browif '%att-type; %att-name; %att-height; %att-width; %att-baseline; %att-overflow; %att-altimg; %att-alttext; ' ><!-- the top level math element --><!-- math contains MathML encoded mathematics --><!-- math has the browser info attributes iff it is the browser interface element also --><!ELEMENT math - - (%MathExpression;) > <!ATTLIST math %att-topinfo; %att-browif; ><!-- end of DTD fragment --><!-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* -->

# Annex D: CALS Table DTD

<!-- \*\*\*\*\* CALS TABLE TAGS - ELEMENTS AND ATTRIBUTES \*\*\*\*\* --><!-- The following declarations may be referred to using a public entity as follows: <!ENTITY % tablepac PUBLIC "-//USA-DOD//DTD CALS MIL-M-28001 TABLEPAK 950127 //EN">--><!ENTITY % bodyatt "id ID #IMPLIED" ><!ENTITY % yesorno "NUMBER" ><!-- \*\*\*\*\* CALS TABLE TAGS - MAIN STRUCTURES \*\*\*\*\* --><!ELEMENT (table ) - - ((%titles;), tgroup+) -(table) ><!ATTLIST (table) tabstyle NMTOKEN #IMPLIED tocentry %yesorno; "1" shortentry %yesorno; #IMPLIED frame (top | bottom | topbot | all | sides | none) #IMPLIED colsep %yesorno; #IMPLIED rowsep %yesorno; #IMPLIED orient (port | land) #IMPLIED pgwide %yesorno; #IMPLIED %bodyatt; > <!ELEMENT tgroup - o (colspec\*, spanspec\*, thead?, tfoot?, tbody) ><!ATTLIST tgroup cols NUMBER #REQUIRED tgroupstyle NMTOKEN #IMPLIED colsep %yesorno; #IMPLIED rowsep %yesorno; #IMPLIED align (left | right | center | justify | char ) "left" charoff NUTOKEN "50" char CDATA ""><!ELEMENT colspec - o EMPTY><!ATTLIST colspec colnum NUMBER #IMPLIED colname NMTOKEN #IMPLIED align (left | right | center | justify | char) #IMPLIED charoff NUTOKEN #IMPLIED char CDATA #IMPLIED colwidth CDATA #IMPLIED colsep %yesorno; #IMPLIED rowsep %yesorno; #IMPLIED> <!ELEMENT spanspec - o EMPTY ><!ATTLIST spanspec namest NMTOKEN #REQUIRED nameend NMTOKEN #REQUIRED spanname NMTOKEN #REQUIRED align (left|right|center|justify|char) "center" charoff NUTOKEN #IMPLIED char CDATA #IMPLIED colsep %yesorno; #IMPLIED rowsep %yesorno; #IMPLIED> <!ELEMENT (thead | tfoot) - o (colspec\*, row+) -(entrytbl) ><!ATTLIST thead valign (top | middle | bottom) "bottom" ><!ATTLIST tfoot valign (top | middle | bottom) "top" ><!ELEMENT tbody - o (row+) ><!ATTLIST tbody valign (top | middle | bottom) "top" ><!ELEMENT row - o (entry | entrytbl)+ ><!ATTLIST row rowsep %yesorno; #IMPLIED ><!ELEMENT entry - o (para | %paracon;)+><!ATTLIST entry colname NMTOKEN #IMPLIED namest NMTOKEN #IMPLIED nameend NMTOKEN #IMPLIED spanname NMTOKEN #IMPLIED morerows NUMBER "0" colsep %yesorno; #IMPLIED rowsep %yesorno; #IMPLIED rotate %yesorno; "0" valign (top | bottom | middle) "top" align (left | right | center | justify | char ) #IMPLIED charoff NUTOKEN #IMPLIED char CDATA #IMPLIED ><!ELEMENT entrytbl - - (colspec\*, spanspec\*, thead?, tbody)+ -(entrytbl)><!ATTLIST entrytbl cols NUMBER #REQUIRED tgroupstyle NMTOKEN #IMPLIED colname NMTOKEN #IMPLIED spanname NMTOKEN #IMPLIED colsep %yesorno; #IMPLIED rowsep %yesorno; #IMPLIED align (left | right | center | justify | char ) #IMPLIED charoff NUTOKEN #IMPLIED char CDATA #IMPLIED >

# Annex E: Specification of file names for Grant Red Book data.

Grant Red Book data is delivered weekly. Each tape contains approximately 3,000 patents (800 megabytes) on one DLT IIIXT (TK85XT) magnetic tape. All files associated with a specific patent are compressed and zipped into a single patent zip file. Zipped patent files are grouped by type within a predetermined directory scheme and re-zipped with path information (but not compressed) into a single weekly update file. The weekly update file is then copied to a DLT tape using the UNIX TAR facility. Patent grouping is based on the following directory tree:

YYYYMMDD |-UTIL0601 |-US0601nnnn-YYYYMMDD.ZIP |-US0601nnnn-YYYYMMDD.ZIP |- . . . |-UTIL0602 |-US0602nnnn-YYYYMMDD.ZIP |- . . . |-UTIL0603 . . . |-PLANT |-USP0nnnnnn-YYYYMMDD.ZIP |- . . . |-DESIGN |-USD0nnnnnn-YYYYMMDD.ZIP |- . . . |-REISSUE |-USREnnnnnn-YYYYMMDD.ZIP |- . . . |-SIR |-USH0nnnnnn-YYYYMMDD.ZIP |- . . . |-DTDS |-ENTITIES Where: 1. The root directory is the issue date; 2. Utility patents are distributed into subdirectories “UTIL” plus the first four characters of the patent number. This assures a maximum of 1000 zipped patent files within a single directory. 3. Plant, Design, Reissue, and Sir patents are distributed into their respective directories listed above. Note that if the weekly issue does not have a specific patent type, then the patent type sub-directory will be omitted. 4. Sub-directory DTDS contains the DTDs and catalogs used to parse the issue. 5. Sub-directory ENTITIES contains the entity files and glyphs referenced by the Grant Red Book DTD. Each patent zip file contains all the files for that one patent. Within the zip file, there will be exactly one \*.SGM file and any number of associated files for complex work units (CWUs, which includes chemical structures, mathematical formulae, tables, and gene sequence listings), for drawings, and for any characters which are rendered as bitmaps (so-called "pullouts"). In addition to the SGML markup of all text content and references to pullouts, the \*.SGM file includes MathML markup for formulas (made SGML-compliant), CALS Table markup for tables, SGML markup for sequence listings, and references to each of the associated files. For further details about SGM file content, see the Grant Red Book specification. File names consist of the following components, as needed, in the order shown. aacccccccc-nnnnnnnn-annnnn-nnnn.aaa AA Issuing country (US). CCCCCCCC Patent number (8 characters or numbers)

- Dash NNNNNNNN Issue date as YYYYMMDD (MM and DD left-padded) – Dash A Content type (D, C, M, T, S, or P) NNNNN Left-padded sequence number – Dash NNNN Left-padded page number. Period AAA File format (ZIP, SGM, TIF, CDX, MOL, NB). The sequence numbers represents the order in which the CWUs of a given type appear in the printed document. If a CWU is so large that more than one page is required for the printed document, then the image of each printed page will be in a separate file and numbered as shown below. Examples: US06000000-19990120.ZIP: The compressed file, US06000000-19990120.SGM: SGML and other markup, USD0367557-19990120-D00001.TIF: First drawing image, US06000000-19990120-C00001.TIF: First chemistry image, US06000000-19990120-C00001.CDX: CDX file for same, US06000000-19990120-C00001.MOL: MOL file for same, US06000000-19990120-M00001.TIF: First math image, US06000000-19990120-M00001.NB: Mathematica file for same,

US06000000-19990120-T00001.TIF: First table image, US06000000-19990120-T00002-0001.TIF: Second table image, first page, USRE035111-19990120-T00002-0002.TIF: Second table image, second page, US06000000-19990120-S00001.TIF: First sequence listing,

US06000000-19990120-S00002-0001.TIF: Second sequence listing, first page,

US06000000-19990120-S00002-0002.TIF: Second sequence listing, second page,

USPP023555-19990120-P00039.TIF: Thirty-ninth pullout image.

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