Grant Red Book

Specification for SGML Markup of United States Patent Grant Publications

V1.9

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U.S. Patent & Trademark Office
Office of Information Dissemination Services

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MARKUP OF U.S. PATENT DOCUMENTS USING SGML

INTRODUCTION

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 the 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 Tag	End 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. *SGML : 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:

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PART 1: SGML MARKUP FOR COMMON TEXT

GENERAL TEXT TAGS

GENERAL TEXT TAGS		
Tag	**Name**	**Description**
BOLD	Bold	Bold
BRFSUM	BRieF SUMmary	Brief summary of the invention
BTEXT	Body TEXT	Body of the various components of SDODE
CHEM-US	Chemistry	Chemical entities of all types
CHEMCDX	CDX file	External file with a chemical entity in CDX format
CHEMMOL	MOL file	External file with a chemical entity in MOL format
CRF	Chemical ReFerence	Reference to a chemical expression
CUSTOM-CHARACTER	Custom character	Entity reference to a character bitmap
CWU	Complex Work Unit	Complex work unit (math expressions, chemical expressions, tables, sequence listings)
DATE	DATE	Date
DEL-E	DELete End	End of deleted text
DEL-S	DELete Start	Start of deleted text
DETDESC	DETailed DESCription	Detailed description of the invention.
DFREF	Display Formula REFerence	Reference to a mathematical expression
DRWDESC	DRaWing DESCription	Description of the drawings
DULINE	DoUble underLINE	Double underline
F	Formula	In-line formula
FOO	FOOtnote	Indicates a footnote
FOR	FOotnote Reference	Indicates a reference to a previous footnote
GOVINT	GOVernment INTerest	Indicates a property interest is held by the U.S. Federal government
H	Heading level	Indicates a separate text portion that precedes text parts, for example, paragraphs
HIL	HIghLighting	Various types of emphasis
IMG	IMaGe	Embedded images
INS-E	INSert End	End of inserted text
INS-S	INSert Start	Start of inserted text
ITALIC	Italic	Italic
LTL	LiTeraL	Indicates the beginning of text in which the space, indents, line endings, etc., should be preserved as keyed in the original document

GENERAL TEXT TAGS		
Tag	**Name**	**Description**
MATH-US	MATHematics	Displayed and in-line math formulae
MATHEMATICA	Mathematica	External file with a math formula in Mathematica format
MATHML	MathML	SGML-compliant MathML markup for a math formula
PARA	PARagraph	Indicates a text portion known as a paragraph and implies that the text will begin on a new line
PAREF	PARagraph REFerence	Indicates a reference to a particular paragraph by its paragraph number
PATDOC	PATent DOCument	A patent specification document instance
PDAT	PcDATa	Parsable character data, with DEL and INS. Terminal content model for all branches of the DTD tree.
PTEXT	Paragraph TEXT	Contents of a paragraph
RELAPP	RELated APPlications	Other patent relations
SB	SuBscript	Indicates text which is to be placed as a subscript to the preceding text, outside mathematical formulae
SDOAB	Sub-DOcument ABstract	Indicates the abstract
SDOBI	Sub-DOcument BIbliography	Indicates the bibliographic information contained on the first page
SDOCL	Sub-DOcument Claims	Indicates the claims
SDOCR	Sub-DOcument OCR	Indicates text captured using OCR processing
SDODE	Sub-DOcument Description	Indicates the description of the invention
SDODR	Sub-DOcument Drawings	Indicates the drawings, if any
SEQ-EMBD		Sequence listing embedded in other text
SEQ-LST		A sequence listing
SEQLST-US		A sequence listing and its image
SEQREF		Reference to a sequence listing
SMALLCAPS	Small Caps	Small capital letters
SP	SuPerscript	Indicates text which is to be placed as a superscript to the preceding text, outside mathematical formulae
STEXT		Text including limited special formatting or CWUs
TABLE-CALS		Table in CALS markup
TABLE-US		Table
TBLREF		Reference to a table by its ID
ULINE	UnderLINE	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 $E=MC^2$ or H_2O, 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 leaing 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 text
    Has 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	**Name**	**Description**
CL	Claim List	List of claims
CLM	CLaiM	A claim
CLMSTEP	ClaiM STEP	A logical step or element of a claim
CLREF	CLaim REFerence	Reference to a claim by its ID
DD	Definition Description	The definition of an item in a definition list
DL	Definition List	Indicates a text portion to be displayed as a list, each item comprising a term followed by a description
DT	Definition Term	The term in a definition list
LI	List Item	An item which forms part of a simple, ordered or unordered list
LST	LiST	Lists of all types
LSTREF	LiST REFerence	Reference to a list by its list number
OL	Ordered List	Each item in this type of list is identified by a sequential number or letter
SL	Simple List	Indicates a text portion to be displayed as a simple list (no bullets or numbers)
UL	Unordered List	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	**Name**	**Description**
ELE	Embedded image LEgend	Indicates a portion of text directly related to an embedded image
EMI	EMbedded Image	Indicates non character-coded data.
EMR	EMbedded image Reference	Indicates a reference to a previous EMI
FGREF	FiGure REFerence	Reference to a figure (drawing) by its ID
RTI	Replacement of Text by Image	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		**Content**	**Description**
CIT			**Patent Document Citation**
	DOC	See below	Cited document
	B220	See below	Application filing date
	B140	See below	Document date (publication or issue)
	NAM	See below	Citation applicant or patentee
	PIC	PDAT	IPC of citation
	PNC	PDAT	National classification of citation
	NCIT	PDAT	Non-patent document citations
	REL	PDAT	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			**Document Identification**
	DNUM	PDAT	Document number
	DATE	PDAT	Document date
	CTRY	PDAT	Publishing country or organization (ST.3)
	KIND	PDAT	Document kind (ST.16)
	BNUM	PDAT	Bulletin number
	DTXT	STEXT	Descriptive text
PARENT-US			**Describes parent document**
	DNUM	PDAT	Document number
	CDOC	DOC	Child document
	PDOC	DOC	Parent document
	PSTA	PDAT	Parent application status
	PPUB	DOC	Patent associated with parent document
SIBLING			**Divisional reissue siblings**
	CDOC	DOC	Child document identification
	SDOC	DOC	Divisional reissue sibling application
	SPUB	DOC	Divisional reissue sibling patent

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

NAME AND ADDRESS TAGS				
PARTY-US				**Individual or Organization Data**
	NAM			Individual or organization name
		TTL	PDAT	Title
		FNM	PDAT	Given, middle name(s) and/or Initials
		SNM	PDAT	Family name, last, surname, organization name
		SFX	PDAT	Suffix
		IID	PDAT	Individual ID number
		IRF	PDAT	Individual reference number
		SYN	PDAT	Synonym, cross reference
		ONM	PDAT	Organization name
		OID	PDAT	Identifying number of organization
		ODV	PDAT	Division of organization
		DID	PDAT	Identifying number of division
	ADR			Individual or organization address
		NAM	See above	Name, organization, if part of address
		OMC	PDAT	Organization mail code
		PBOX	PDAT	Post office box number
		STR	PDAT	Street, house number or name, district (of city), apt. number, etc.
		CITY	PDAT	City or town
		CNTY	PDAT	County, parish, department, etc.
		STATE	PDAT	Region of country (state, province, etc.)
		CTRY	PDAT	Country
		PCODE	PDAT	Postal code
		EAD	PDAT	Electronic address (e.g., e-mail)
		TEL	PDAT	Telephone number, including area or regional code
		FAX	PDAT	Facsimile telephone number
	RESIDENCE			Place of residence
		MILS	PDAT	Military service
		CITY	PDAT	City
		STATE	PDAT	State
		CTRY	PDAT	Country
	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) >
```

Example

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			**Name**	**Description**
S160			§160	Number of sequence IDs
S-1-V			(1)(v)	Computer readable form
	S-1-V-A		(1)(v)(A)	Medium type; Type of diskette/tape submitted
	S-1-V-B		(1)(v)(B)	Computer; Type of computer used with diskette/tape submitted
	S-1-V-C		(1)(v)(C)	Operating system
S200			§200	Structure for S2xx tags; not in ST.25
	S210		§210	Sequence identification number
	S211		§211	Number of bases or amino acid residues
	S212		§212	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.
	S-2-I		(2)(I)	Sequence characteristics
		S-2-I-C	(2)(I)(C)	Strandedness. If nucleic acid, number of strands of source organism molecule, i.e., whether single stranded, double stranded, both, or unknown to applicant.
		S-2-I-D	(2)(I)(D)	Topology. Whether source organism molecule is circular, linear, both, or unknown to applicant.
	S-2-II		(2)(ii)	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.

SEQUENCE-LISTING TAGS				
Tag			Name	Description
		S-2-II-A	(2)(ii)(A)	Description (protein and peptide)
	S-2-III		(2)(iii)	Hypothetical? (yes, no)
	S-2-IV		(2)(iv)	Anti-sense? (yes, no)
	S-2-V		(2)(v)	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.
	S213		§213	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.
	S-2-VI			
		S-2-VI-B	(2)(vi)(B)	Strain
		S-2-VI-C	(2)(vi)(C)	Individual isolate
		S-2-VI-D	(2)(vi)(D)	Developmental stage. Give developmental stage of source organism and indicate whether derived from germ-line or rearranged developmental pattern.
		S-2-VI-E	(2)(vi)(E)	Haplotype
		S-2-VI-F	(2)(vi)(F)	Tissue type
		S-2-VI-G	(2)(vi)(G)	Tissue type
		S-2-VI-H	(2)(vi)(H)	Cell line
		S-2-VI-I	(2)(vi)(I)	Organelle
	S-2-VII		(2)(vii)	Container for A and B below
		S-2-VII-A	(2)(vii)(A)	Library (type and name)
		S-2-VII-B	(2)(vii)(B)	Clone(s)
	S-2-VIII		(2)(viii)	Position in genome
		S-2-VIII-A	(2)(viii)(A)	Chromosome or segment name or number
		S-2-VIII-B	(2)(viii)(B)	Map position
		S-2-VIII-C	(2)(viii)(C)	Units for map position (genome percent, nucleotide number, etc.
	S220		§220	Sequence feature; description a point of biological significance in the sequence.
		S221	§221	Name/Key. Appropriate identifier for this feature, preferably from WIPO Standard ST.25 (1998), Appendix 2, tables 5 and 6.

SEQUENCE-LISTING TAGS				
Tag			Name	Description
		S222	§222	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.
		S-2-IX-C	(2)(ix)(C)	Method by which the sequence was identified: experiment, similarity with known sequence or to established consensus sequence or to some other pattern.
		S223	§223	Other relevant information. Limited to approximately 288 characters of text.
	S300		Citations	Publication information
		S301	PARTY-US	Authors
		S302	PDAT	Paper title
		S303	PDAT	Journal title
		S304	PDAT	Journal volume number
		S305	PDAT	Journal issue number
		S306	PDAT	Start and end pages
		S307	DATE	Journal publication date
		S308	PDAT	Database name and accession number
		S309	DATE	Database entry date
		S313	PDAT	Relevant residues
	S400		§400	The sequence itself.

The following table shows the ST.25 Identifier followed by the corresponding Red-Book tag.

110	B720
120	B540
130	S130
140	B210
141	B220
150	B310
151	B320
160	S160
170	S170
	S200 (not in ST.25)
210	S210
211	S211
212	S212
213	S213
220	S220
221	S221
222	S222
223	S223
300	S300
301	S301
302	S302
303	S303
304	S304
305	S305
306	S306
307	S307
308	S308
309	S309
310	DNUM
311	B220
312	B140
313	S313
400	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.

(1)(v)	S-1-V
(1)(v)(A)	S-1-V-A
(1)(v)(B)	S-1-V-B
(1)(v)(C)	S-1-V-C
(2)(i)	S-2-I
(2)(i)(C)	S-2-I-C
(2)(i)(D)	S-2-I-D
(2)(ii)	S-2-II
(2)(ii)(A)	S-2-II-A
(2)(iii)	S-2-III
(2)(iv)	S-2-IV
(2)(v)	S-2-V
(2)(vi)(B)	S-2-VI-B
(2)(vi)(C)	S-2-VI-B
(2)(vi)(D)	S-2-VI-D
(2)(vi)(E)	S-2-VI-E
(2)(vi)(F)	S-2-VI-F
(2)(vi)(G)	S-2-VI-G
(2)(vi)(H)	S-2-VI-H
(2)(vi)(I)	S-2-VI-I
(2)(vii)	S-2-VII
(2)(vii)(A)	S-2-VII-A
(2)(vii)(B)	S-2-VII-B
(2)(viii)	S-2-VIII
(2)(viii)(A)	S-2-VII
(2)(viii)(B)	S-2-VII
(2)(viii)(C)	S-2-VII
(2)(ix)(C)	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			**Content**	**Description**
B100				**Document Identification**
	B110		DNUM	Number of the patent document, usually the publication number
	B122US		PDAT	SIR explanation (fixed text)
	B130		PDAT	Kind of document (ST.16)
	B140		DATE	Document date, usually date of publication
	B190		PDAT	Publishing country or organization (ST.3)
B200				**Domestic Filing Data**
	B210		DNUM	Number assigned to the application
	B211US		PDAT	Series code
	B220		DATE	Application filing date
	B221US		EMPTY	Rule 47 flag
	B222US		EMPTY	CPA flag
B300				**Foreign Priority Data**
	B310		DNUM	Priority application number
	B320		DATE	Date of filing of priority application
	B330		CTRY	Publishing country or organization (ST.3)
B400				**Public Availability Dates**
	B472			Term of grant
		B473	DATE	Disclaimer date
		B473US	EMPTY	Terminal disclaimer flag
		B474	PDAT	Term of grant
		B474US	PDAT	Term extension (35USC154(b))
B500				**Technical Information**
	B510			International Patent Classification (IPC) data
		B511	PDAT	Main classification
		B512	PDAT	Further classification
		B516	PDAT	Edition of IPC
	B520			Domestic or national classification
		B521	PDAT	Main classification
		B522	PDAT	U.S.: Official cross-reference classification
		B522US	PDAT	U.S.: Unofficial cross-reference classification
	B540		STEXT	Title of the invention
	B560			Citations
		B561	PCIT	Patent citation (with B563 and B564)
		B562	NCIT	Non-Patent citation (with B563 and B564)
	B570			Claims allowed, or representative claim(s)
		B577	PDAT	Number of claims allowed
		B578US	PDAT	Exemplary claim number
	B580			Field of search
		B581	PDAT	IPC
		B582	PDAT	National classification (structured)

U.S. BIB TAGS				
Tag			Content	Description
		B583US	PDAT	National classification (unstructured)
	B590			Specification and drawing
		B594US	PDAT	Number of microforms and pages thereon
		B595	PDAT	Number of drawing sheets
		B595US	PDAT	Number of drawing sheets submitted in color
		B596	PDAT	Number of figures
B600				**Related patents or applications**
	B610		PARENT-US	Earlier document to which this Is an addition
	B620		PARENT-US	Earlier application from which the present document has been divided out
	B630			Continuations
		B631	PARENT-US	Earlier application of which the present document is a continuation
		B632	PARENT-US	Document of which this is a continuation-in-part
		B633	PARENT-US	Document of which this is a continuing reissue
	B640		PARENT-US	Document being reissued
	B641US		PARENT-US, SIBLING	Divisional reissue of a related U.S. document
	B645		PARENT-US	Document of which this is a reexamination
	B645US		PDAT	Reissue merged with reexamination
	B650		DOC	Previously-published document concerning the same application
	B660		PARENT-US	Document for which this is a substitute
	B680US		DOC	Provisional application
B700				**Parties Concerned with the Document**
	B720			Inventor information
		B721	PARTY-US	Name and address
	B730			Grantee (assignee) information
		B731	PARTY-US	Name and address
		B732US	PDAT	Assignee type code (USPTO)
	B740			Attorney, agent, representative information
		B741	PARTY-US	Name and address
	B745			Persons acting upon the document
		B746	PARTY-US	Primary examiner
		B747	PARTY-US	Assistant examiner
		B748US	PDAT	Technology center, etc.
B800				**International Convention Data other than the Paris Convention**
	B830			Microorganism deposits information
		B831	PDAT	Deposit file number
		B832	PDAT	Authority where deposit made
		B833	DATE	Date of deposit
	B860			PCT or regional filing information
		B861	DOC	Document Identification
		B863	DATE	35USC371 Date

U.S. BIB TAGS				
Tag			Content	Description
		B864	DATE	35USC102(e) Date
	B870			PCT or regional publication information
		B871	DOC	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	*Content*	*Format*
1	Section	1 alphabetic
2 - 3	Class	2 numeric
4	Subclass	1 alphabetic
5 - 7	Group	3 alphanumeric, right justified, leading spaces
8 +	Subgroup	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	*Content*	*Format*
1 - 2	Class	2 numeric, right justified, leading zeros
3 - 4	Subclass	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) >
```

Example

228. <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	*Content*	*Description*
1 – 3	U.S. Class, 3 positions	3 alphanumeric, right justified with leading space; or "D" followed by 1 or 2 right-justified digits with leading space; or "PLT"
4 +	U.S. Subclass, variable length	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. paten 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 : Grant Red Book SGML Declaration for U.S. Patent Documents

The SGML Declaration below contains the reference concrete syntax to be applied when using 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 Red Book     Green Book
       "+P "     <PARA LVL="0">   PAR
       "+P0 "    <PARA LVL="1">   PA0
       "+P1 "    <PARA LVL="2">   PA1
       "+P2 "    <PARA LVL="3">   PA2
       "+P3 "    <PARA LVL="4">   PA3
       "+P4 "    <PARA LVL="5">   PA4
       "+P5 "    <PARA LVL="6">   PA5
       "+PS "    <PARA LVL="7">   PAL
       "+PA "    <PARA LVL="0">   PAR (abstract paragraph - reference the SDOAB element)
       "+CL "    <H LVL="1">      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 **********
-->
<!-- DOCTYPE PATDOC [ -->
<!ENTITY % ISOAMSA PUBLIC "ISO 9573-13:1991//ENTITIES Added Math Symbols: Arrow
Relations//EN"> %ISOAMSA;
<!ENTITY % ISOAMSB PUBLIC "ISO 9573-13:1991//ENTITIES Added Math Symbols: Binary
Operators//EN"> %ISOAMSB;
<!ENTITY % ISOamsc PUBLIC "ISO 8879-1986//ENTITIES Added Math Symbols: Delimiters//EN">
%ISOamsc;
<!ENTITY % ISOamsn PUBLIC "ISO 8879-1986//ENTITIES Added Math Symbols: Negated
Relations//EN"> %ISOamsn;
<!ENTITY % ISOamso PUBLIC "ISO 8879-1986//ENTITIES Added Math Symbols: Ordinary//EN">
%ISOamso;
<!ENTITY % ISOamsr PUBLIC "ISO 8879-1986//ENTITIES Added Math Symbols: Relations//EN">
%ISOamsr;
<!ENTITY % ISObox PUBLIC "ISO 8879-1986//ENTITIES Box and Line Drawing//EN"> %ISObox;
<!ENTITY % ISOCH PUBLIC "ISO 9573-11:1992//ENTITIES Chemistry//EN"> %ISOCH;
<!ENTITY % ISOCHEM PUBLIC "ISO 9573-13:1991//ENTITIES Chemistry//EN"> %ISOCHEM;
<!ENTITY % ISOcyr1 PUBLIC "ISO 8879-1986//ENTITIES Russian Cyrillic//EN"> %ISOcyr1;
<!ENTITY % ISOcyr2 PUBLIC "ISO 8879-1986//ENTITIES Non-Russian Cyrillic//EN"> %ISOcyr2;
<!ENTITY % ISOdia PUBLIC "ISO 8879-1986//ENTITIES Diacritical Marks//EN"> %ISOdia;
<!ENTITY % ISOgrk1 PUBLIC "ISO 8879-1986//ENTITIES Greek Letters//EN"> %ISOgrk1;
<!ENTITY % ISOgrk2 PUBLIC "ISO 8879-1986//ENTITIES Monotoniko Greek//EN"> %ISOgrk2;
<!ENTITY % ISOgrk3 PUBLIC "ISO 8879-1986//ENTITIES Greek Symbols//EN"> %ISOgrk3;
<!ENTITY % ISOgrk3B PUBLIC "ISO 9573-13:1991//ENTITIES Greek Symbols //EN"> %ISOgrk3B;
<!ENTITY % ISOgrk4 PUBLIC "ISO 8879-1986//ENTITIES Alternative Greek Symbols//EN">
%ISOgrk4;
<!ENTITY % ISOlat1 PUBLIC "ISO 8879-1986//ENTITIES Added Latin 1//EN"> %ISOlat1;
<!ENTITY % ISOlat2 PUBLIC "ISO 8879-1986//ENTITIES Added Latin 2//EN"> %ISOlat2;
<!ENTITY % ISOMFRK PUBLIC "ISO 9573-13:1991//ENTITIES Math Alphabets: Fraktur//EN">
%ISOMFRK;
<!ENTITY % ISOMOPF PUBLIC "ISO 9573-13:1991//ENTITIES Math Alphabets: Open Face//EN">
%ISOMOPF;
<!ENTITY % ISOMSCR PUBLIC "ISO 9573-13:1991//ENTITIES Math Alphabets: Script//EN">
%ISOMSCR;
<!ENTITY % ISOnum PUBLIC "ISO 8879-1986//ENTITIES Numeric and Special Graphic//EN">
%ISOnum;
<!ENTITY % ISOPUB PUBLIC "ISO 9573-13:1991//ENTITIES Publishing//EN"> %ISOPUB;
<!ENTITY % ISOTECH PUBLIC "ISO 9573-13:1991//ENTITIES General Technical//EN"> %ISOTECH;
<!ENTITY % uspto PUBLIC "-//USPTO//ENTITIES USPTO special character entities//EN">
%uspto;
<!ENTITY % mathmlAlias PUBLIC "-//USPTO//ENTITIES MATHML Alias Entity Names//EN">
%mathmlAlias;
<!ENTITY % mathmlExtra PUBLIC "-//USPTO//ENTITIES MATHML Extra Entity Names//EN">
%mathmlExtra;
<!ENTITY % mathpac PUBLIC "-//W3C//DTD MATHML 19981208 Red Book Mod //EN" > %mathpac;
<!ENTITY % paracon "PTEXT*" >
<!ENTITY % titles "PTEXT*" >
<!ENTITY % tablepac PUBLIC "-//USA-DOD//DTD CALS MIL-M-28001 TABLEPAK 950127 //EN" >
%tablepac;
<!ENTITY % iso-pub PUBLIC "ISO 8879-1986//ENTITIES Publishing//EN" > %iso-pub;
<!ENTITY % ISO-amsa PUBLIC "ISO 8879-1986//ENTITIES Added Math Symbols: Arrow
Relations//EN" > %ISO-amsa;
```

```
<!NOTATION TIF PUBLIC "-//Aldus//NOTATION Tagged Image File Format//EN" >
<!NOTATION CDX PUBLIC "-//CambridgeSoft Corp.//NOTATION ChemDraw Format 4.x//EN" >
<!NOTATION MOL PUBLIC "-//MDL Information Systems//NOTATION Chemical Expression File
Format//EN" >
<!NOTATION NB PUBLIC "-//Mathmatica//NOTATION Mathmatica File Format//EN">

<!--Components of an address-->
<!ELEMENT ADR  - - (OMC?,PBOX?,STR*,CITY?,CNTY?,STATE?,CTRY?,PCODE?,EAD*,TEL*,FAX*) >

<!--Document identification-->
<!ELEMENT B100  - - (B110,B122US?,B130,B140,B190) >

<!--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
disclaimer.-->
<!ELEMENT B473US  - O  EMPTY  >

<!--Term of Grant.
MANDATORY for US Design Patents only.-->
<!ELEMENT B474  - - (PDAT) >

<!--Term extension under 35 USC 154(b). Either "5 years", or the number of days (as an
integer)
if the extension is less than five years.-->
<!ELEMENT B474US  - - (PDAT) >

<!--Technical information-->
<!ELEMENT B500  - - (B510,B520,B540,B560?,B570,B580,B590?) >

<!--International Patent Classification (IPC) data.-->
<!ELEMENT B510  - - (B511,B512*,B516) >

<!--International Patent Classification (IPC) Main classification
or Locarno Classification for Design patents-->
<!ELEMENT B511  - - (PDAT) >

<!--Further IPC classification-->
<!ELEMENT B512  - - (PDAT) >

<!--Edition, version of IPC-->
<!ELEMENT B516  - - (PDAT) >

<!--Domestic or national classification data-->
<!ELEMENT B520  - - (B521,B522*,B522US*) >

<!--Domestic or National classification, Main classification.
US: Original classification (OR).-->
<!ELEMENT B521  - - (PDAT) >
```

```
<!--Further classification
US: Cross-reference classification (official, or XR)-->
<!ELEMENT B522  - - (PDAT) >

<!--Further classification
US: Cross-reference classification (unofficial, or UR)-->
<!ELEMENT B522US  - - (PDAT) >

<!--Title of invention-->
<!ELEMENT B540  - - (STEXT+) >

<!--Citations-->
<!ELEMENT B560  - - (B561 | B562)+ >

<!--Citing a patent document-->
<!ELEMENT B561  - - (PCIT) >

<!--Citing non-patent literature-->
<!ELEMENT B562  - - (NCIT) >

<!--Claims allowed or representative claim(s).-->
<!ELEMENT B570  - - (B577,B578US*) >

<!--Number of claims allowed.-->
<!ELEMENT B577  - - (PDAT) >

<!--Exemplary claim number.-->
<!ELEMENT B578US  - - (PDAT) >

<!--Field of search-->
<!ELEMENT B580  - - (B581*,(B582|B583US)+) >

<!--International patent classification (IPC)-->
<!ELEMENT B581  - - (PDAT) >

<!--National classification.
Use for structured US Classification information:
...Pos. 1 - 3 ... Class
3 alphanumeric characters, right justified; D for design classes,
followed by one or two right-justified digits; PLT for Plant classes
...Pos. 4 - ... Subclass
alphanumeric, variable length-->
<!ELEMENT B582  - - (PDAT) >

<!--US classification, unstructured. Could be any combination of classes, subclasses,
ranges
of subclasses, etc.-->
<!ELEMENT B583US  - - (PDAT) >

<!--Specification and drawings-->
<!ELEMENT B590  - - (B594US?,B595?,B595US?,B596) >

<!--If there is an optical microform (microfiche, microfilm, microcard, etc.) appendix,
the number of microforms and the number of pages imaged thereon (separated by a comma)
are shown here.-->
<!ELEMENT B594US  - - (PDAT) >

<!--Number of drawing sheets submitted by applicant-->
<!ELEMENT B595  - - (PDAT) >

<!--Number of drawing sheets submitted in color-->
<!ELEMENT B595US  - - (PDAT) >

<!--Number of figures (not the same as B595)-->
<!ELEMENT B596  - - (PDAT) >
```

```
<!--Related patents or applications-->
<!ELEMENT B600  - - (B610 | B620 | B630 | B640 | B641US | B645 | B645US | B660 |
              B680US)+ >

<!--Earlier document to which this is an addition-->
<!ELEMENT B610  - - (PARENT-US) >

<!--Earlier application from which the present document has been divided out.-->
<!ELEMENT B620  - - (PARENT-US) >

<!--Continuations-->
<!ELEMENT B630  - - (B631 | B632 | B633)+ >

<!--Earlier application of which the present document is a continuation-->
<!ELEMENT B631  - - (PARENT-US) >

<!--Document of which this is a continuation-in-part-->
<!ELEMENT B632  - - (PARENT-US) >

<!--Document of which this is a continuing reissue-->
<!ELEMENT B633  - - (PARENT-US) >

<!--Reissue-->
<!ELEMENT B640  - - (PARENT-US) >

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

<!--Reexamination-->
<!ELEMENT B645  - - (PARENT-US) >

<!--Present when a reissue application was merged with a reexamination proceeding.
The issuing document is a reissue patent which shows the following Reexamination results
statement on the reissue patent front page, immediately following the abstract.
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)."
-->
<!ELEMENT B645US  - - (PDAT) >

<!--Previously-published document concerning the same application-->
<!ELEMENT B650  - - (DOC) >

<!--Document for which this is a substitute-->
<!ELEMENT B660  - - (PARENT-US) >

<!--US Provisional Application information-->
<!ELEMENT B680US  - - (DOC) >

<!--Parties concerned with the document-->
<!ELEMENT B700  - - (B720,B730?,B740?,B745) >

<!--Inventor information-->
<!ELEMENT B720  - - (B721+) >

<!--Inventor name, address, and residence.-->
<!ELEMENT B721  - - (PARTY-US) >

<!--Assignee-->
<!ELEMENT B730  - - (B731,B732US)+ >

<!--Assignee name and address-->
<!ELEMENT B731  - - (PARTY-US) >
```

```
<!--Assignee type code:
01 Unassigned
02 United States company or corporation
03 Foreign company or corporation
04 United States individual
05 Foreign individual
06 United States government
07 Foreign government
08 County government (US)
09 State government (US)-->
<!ELEMENT B732US  - - (PDAT) >

<!--Attorney, agent, or representative.
US: Maximum of three.-->
<!ELEMENT B740  - - (B741+) >

<!--Attorney name and address-->
<!ELEMENT B741  - - (PARTY-US) >

<!--Persons acting upon the document-->
<!ELEMENT B745  - - (B746,B747*,B748US) >

<!--Primary examiner name-->
<!ELEMENT B746  - - (PARTY-US) >

<!--Assistant examiner name-->
<!ELEMENT B747  - - (PARTY-US) >

<!--Technology Center, Industry Sector, Art Unit, or other grouping of US patent
examiners.-->
<!ELEMENT B748US  - - (PDAT) >

<!--Data related to international conventions-->
<!ELEMENT B800  - - (B860,B870?) >

<!--Microorganism deposit information-->
<!ELEMENT B830  - - (B831,B832?,B833?) >

<!--Deposit file number-->
<!ELEMENT B831  - - (PDAT) >

<!--Identificaiton of authority where deposit was made-->
<!ELEMENT B832  - - (PDAT) >

<!--Date of deposit-->
<!ELEMENT B833  - - (DATE) >

<!--PCT or regional authority filing information-->
<!ELEMENT B860  - - (B861,B863,B864) >

<!--PCT document identification. CTRY is always WO.-->
<!ELEMENT B861  - - (DOC) >

<!--35 USC 371 (PCT) date-->
<!ELEMENT B863  - - (DATE) >

<!--35 USC 102(e) date-->
<!ELEMENT B864  - - (DATE) >

<!--PCT or regional authority publication information-->
<!ELEMENT B870  - - (B871) >

<!--Document identification; CTRY is always WO.-->
<!ELEMENT B871  - - (DOC) >
```

```
<!--Bulletin number-->
<!ELEMENT BNUM  - - (PDAT) >

<!ELEMENT BOLD  - - (PDAT | HIL)* >

<!--Brief Summary-->
<!ELEMENT BRFSUM  - - (BTEXT) >

<!--Body text (container for many kinds of text).-->
<!ELEMENT BTEXT  - - (H | PARA | CWU | IMG)+ >

<!--Child document identification-->
<!ELEMENT CDOC  - - (DOC) >

<!--Chemical Notation-->
<!ELEMENT CHEM-US  - - (CHEMCDX,CHEMMOL,EMI*) >

<!ATTLIST CHEM-US
               ID  ID    #REQUIRED  >

<!--Chemical Notation in CDX4 Format-->
<!ELEMENT CHEMCDX  - O  EMPTY  >

<!ATTLIST CHEMCDX
               ID  ID    #REQUIRED
               FILE  ENTITY    #REQUIRED  >

<!--Chemical notation in MOL format-->
<!ELEMENT CHEMMOL  - O  EMPTY  >

<!ATTLIST CHEMMOL
               ID  ID    #REQUIRED
               FILE  ENTITY    #REQUIRED  >

<!--Citation of patent or non-patent (NCIT) literature-->
<!ELEMENT CIT  - - (((DOC,B220,B140,NAM*,PIC*,PNC*) | NCIT),REL*)+ >

<!--City or town-->
<!ELEMENT CITY  - - (PDAT) >

<!--Ordered Claim list-->
<!ELEMENT CL  - - (CLM+) >

<!--A singular claim-->
<!ELEMENT CLM  - - (PTEXT | PARA | CLMSTEP)+ >

<!--Claim ID-->
<!ATTLIST CLM
               ID  ID    #REQUIRED  >

<!--A logical step or element of a claim.-->
<!ELEMENT CLMSTEP  - - (PTEXT | PARA)+ >

<!--Allowed values are 0, 1, 2, 3, 4, 5.-->
<!ATTLIST CLMSTEP
               LVL (0 | 1 | 2 | 3 | 4 | 5)   #IMPLIED  >

<!--Reference to a claim-->
<!ELEMENT CLREF  - O  EMPTY  >

<!ATTLIST CLREF
               ID  IDREF    #REQUIRED  >

<!--County, parish, department, etc.-->
<!ELEMENT CNTY  - - (PDAT) >
```

```
<!--Reference to chemical expression-->
<!ELEMENT CRF  - O  EMPTY  >

<!ATTLIST CRF
               ID  IDREFS    #REQUIRED  >

<!--Country. Use WIPO Standard ST.3 codes.-->
<!ELEMENT CTRY  - - (PDAT) >

<!--A TIFF image file containing a character which cannot be
represented using any ISO standard character set.-->
<!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  >

<!--Complex work units-->
<!ELEMENT CWU  - - (TABLE-US | MATH-US | CHEM-US | SEQLST-US | DEL-S | DEL-E |
               INS-S | INS-E) >

<!--Date. YYYYMMDD: four-digit year, two-digit month
(leading zeros) and two-digit day (leading zeros).-->
<!ELEMENT DATE  - - (PDAT) >

<!--Definition description-->
<!ELEMENT DD  - - (PTEXT | PARA)+ >

<!--End of deleted text. Must be paired with a DEL-S to which it refers.-->
<!ELEMENT DEL-E  - O  EMPTY  >

<!ATTLIST DEL-E
               ID  IDREF    #REQUIRED  >

<!--Start of deleted text. Must be paired with a DEL-E which refers to it.-->
<!ELEMENT DEL-S  - O  EMPTY  >

<!ATTLIST DEL-S
               ID  ID    #REQUIRED
               DATE  NMTOKEN    #IMPLIED  >

<!ELEMENT DETDESC  - - (BTEXT) >

<!--Reference to formula (math)-->
<!ELEMENT DFREF  - O  EMPTY  >

<!ATTLIST DFREF
               ID  IDREFS    #REQUIRED  >

<!--Identifying number of division-->
<!ELEMENT DID  - - (PDAT) >

<!--List, Definition-->
<!ELEMENT DL  - - (DT,DD)+ >

<!--tsize = Term size attribute
compact = Spacing between items-->
<!ATTLIST DL
               TSIZE  NMTOKEN    #IMPLIED
               COMPACT (COMPACT)   #IMPLIED  >

<!--Document, application, or publication number.-->
```

```
<!ELEMENT DNUM  - - (PDAT) >

<!--Components of document identification-->
<!ELEMENT DOC  - - (DNUM,DATE?,CTRY?,KIND?,BNUM?,DTXT*) >

<!--Drawing Descriptions-->
<!ELEMENT DRWDESC  - - (BTEXT) >

<!--List, Definition, Term-->
<!ELEMENT DT  - - (STEXT+) >

<!--Descriptive text-->
<!ELEMENT DTXT  - - (STEXT*) >

<!--Double underline-->
<!ELEMENT DULINE  - - (PDAT | HIL)* >

<!--Electronic address (e.g., email)-->
<!ELEMENT EAD  - - (PDAT) >

<!--Figure caption; embedded-image legend-->
<!ELEMENT ELE  - - (STEXT) >

<!--Points to the figure (image) to which this is a caption.-->
<!ATTLIST ELE
               ID  IDREF    #REQUIRED  >

<!--Embedded image-->
<!ELEMENT EMI  - O  EMPTY  >

<!--TI, type of image:
AD = abstract drawing
CF = chemical formulae
CI = clipped image
CP = computer program listings
DN = DNA sequences
DR = drawings
FF = undefined characters
FG = figures
GR = graphs
MF = mathematical formulae
PA = full-page facsimile image
PH = photograph
SR = search report form
TB = table or tabular data
TX = text character [deprecated in US documents]
UI = undefined image [deprecated in US documents]-->
<!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  >

<!--Reference to emi-->
<!ELEMENT EMR  - O  EMPTY  >

<!ATTLIST EMR
               ID  IDREF    #REQUIRED  >

<!--In-line formula-->
<!ELEMENT F  - - (MATH | PTEXT) >
```

```
<!--Fax telephone number-->
<!ELEMENT FAX  - - (PDAT) >

<!--Reference to a figure (drawing)-->
<!ELEMENT FGREF  - O  EMPTY  >

<!ATTLIST FGREF
               ID  IDREF    #REQUIRED  >

<!--Given and middle name(s) or initials-->
<!ELEMENT FNM  - - (PDAT) >

<!--Footnotes-->
<!ELEMENT FOO  - - (PTEXT+) >

<!--Footnote id.-->
<!ATTLIST FOO
               ID  ID    #REQUIRED  >

<!--Rreference to a footnote-->
<!ELEMENT FOR  - O  EMPTY  >

<!--Footnote reference ID-->
<!ATTLIST FOR
               ID  IDREF    #REQUIRED  >

<!--Government Interest-->
<!ELEMENT GOVINT  - - (BTEXT) >

<!--Header-->
<!ELEMENT H  - - (STEXT+) >

<!--lvl = level
align = Alignment
Allowed values are 0, 1, 2, 3, 4, 5.-->
<!ATTLIST H
               LVL (0 | 1 | 2 | 3 | 4 | 5)   #IMPLIED
               ALIGN (CENTER | LEFT | RIGHT)  "LEFT" >

<!--Highlighting: literal text, superscripts, subscripts, bold, italic,
underline, double underline, and small caps.-->
<!ELEMENT HIL  - - (LTL | SP | SB | BOLD | ITALIC | ULINE | DULINE | SMALLCAPS)* >

<!--Individual ID number (e.g., US SSSN)-->
<!ELEMENT IID  - - (PDAT) >

<!--Image. For non-ISO standard characters use
CUSTOM-CHARACTER.-->
<!ELEMENT IMG  - - (EMI | EMR | ELE | RTI | DEL-S | DEL-E | INS-S | INS-E)+ >

<!--End of inserted text. Must be paired with an INS-S to which it refers.-->
<!ELEMENT INS-E  - O  EMPTY  >

<!ATTLIST INS-E
               ID  IDREF    #REQUIRED  >

<!--Start of inserted text. Must be paired with an INS-E which refers to it.-->
<!ELEMENT INS-S  - O  EMPTY  >

<!ATTLIST INS-S
               ID  ID    #REQUIRED
               DATE  NMTOKEN    #IMPLIED  >

<!--Individual reference number (filing, etc.)-->
<!ELEMENT IRF  - - (PDAT) >
```

```
<!ELEMENT ITALIC  - - (PDAT | HIL)* >

<!--Document kind (WIPO Standard ST.16), or kind generally-->
<!ELEMENT KIND  - - (PDAT) >

<!--List item-->
<!ELEMENT LI  - - (PTEXT | PARA)+ >

<!--List-->
<!ELEMENT LST  - - (DL | OL | SL | UL) >

<!ATTLIST LST
               ID  ID    #REQUIRED  >

<!--Reference to a list.-->
<!ELEMENT LSTREF  - O  EMPTY  >

<!ATTLIST LSTREF
               ID  IDREF    #REQUIRED  >

<!--Literal text-->
<!ELEMENT LTL  - - (PDAT) >

<!--Displayed and in-line math formulae-->
<!ELEMENT MATH-US  - - (MATHEMATICA,MATHML,EMI*) >

<!ATTLIST MATH-US
               ID  ID    #REQUIRED  >

<!--Formula in Mathematica format-->
<!ELEMENT MATHEMATICA  - O  EMPTY  >

<!ATTLIST MATHEMATICA
               ID  ID    #REQUIRED
               FILE  ENTITY    #REQUIRED  >

<!--Formula in MathML format.-->
<!ELEMENT MATHML  - - (MATH+) >

<!--Military service where the applicant resides.
USN : US Navy
USA : US Army
USAF : US Air Force
USMC : US Marine Corp
USCG : US Coast Guard
etc.
-->
<!ELEMENT MILS  - - (PDAT) >

<!--Name of an individual or organization-->
<!ELEMENT NAM  - - ((TTL?,FNM?,SNM,SFX?,IID?,IRF?) | (ONM,SYN*,OID?,(ODV,DID?)*)) >

<!--Non-patent literature citation-->
<!ELEMENT NCIT  - - (STEXT+) >

<!--Country of nationality-->
<!ELEMENT NCTRY  - - (CTRY) >

<!--Division of organization-->
<!ELEMENT ODV  - - (STEXT+) >

<!--Identifying number of organization-->
<!ELEMENT OID  - - (PDAT) >

<!--List, Ordered-->
```

```
<!ELEMENT OL  - - (LI+) >

<!--compact = Spacing between items
level = Nesting level of list
prefix = Prefix for each list item
numstyle = Numbering style-->
<!ATTLIST OL
               COMPACT (COMPACT)   #IMPLIED
               LEVEL  NMTOKEN    #IMPLIED
               PREFIX  CDATA    #IMPLIED
               NUMSTYLE  CDATA    #IMPLIED  >

<!--Organization mail code
US: use for military address, e.g., Unit 3400 Box 672 APO AE 09128.-->
<!ELEMENT OMC  - - (PDAT) >

<!--Organization name-->
<!ELEMENT ONM  - - (STEXT+) >

<!--Paragraph. Corresponds to P in ST.32. PARA name required for
compatability with CALS Table markup.-->
<!ELEMENT PARA  - - (PTEXT+) >

<!ATTLIST PARA
               ID  ID    #IMPLIED
               LVL (0 | 1 | 2 | 3 | 4 | 5 | 6 | 7)   #IMPLIED  >

<!--Reference to a paragraph number-->
<!ELEMENT PAREF  - O  EMPTY  >

<!ATTLIST PAREF
               ID  IDREF    #IMPLIED  >

<!--Parent/child relationship-->
<!ELEMENT PARENT-US  - - (CDOC,PDOC,B650?,PSTA,PPUB?) >

<!--Components of party-->
<!ELEMENT PARTY-US  - - (NAM,ADR?,RESIDENCE?,DTXT?,RCTRY?,NCTRY?) >

<!--Patent Document-->
<!ELEMENT PATDOC  - - (SDOBI,SDOAB?,SDODE,SDOCL,SDODR?,SDOCR?) >

<!--cy = Country, organization (code from WIPO Standard ST.3)
dnum = Identification number
date = date of publication
file = file identification
kind = Kind of patent (code from WIPO Standard ST.16)
status = Status of the patent document
dtd = Version NUMBER of DTD-->
<!ATTLIST PATDOC
               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.
110.......B720
120.......B540
130.......S130
140.......B210
141.......B220
150.......B310
151.......B320
160.......S160
170.......S170
..........S200 (container for S2xx tags; not in ST.25)
210.......S210
211.......S211
212.......S212
```

```
213.......S213
220.......S220
221.......S221
222.......S222
223.......S223
300.......S300
301.......S301
302.......S302
303.......S303
304.......S304
305.......S305
306.......S306
307.......S307
308.......S308
309.......S309
310.......DNUM
311.......B220
312.......B140
313.......S313
400.......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.
(1)(v).........S-1-V
(1)(v)(A).......S-1-V-A
(1)(v)(B).......S-1-V-B
(1)(v)(C).......S-1-V-C
(2)(i).........S-2-I
(2)(i)(C).......S-2-I-C
(2)(i)(D).......S-2-I-D
(2)(ii).........S-2-II
(2)(ii)(A)......S-2-II-A
(2)(iii)........S-2-III
(2)(iv).........S-2-IV
(2)(v).........S-2-V
(2)(vi)(B)......S-2-VI-B
(2)(vi)(C)......S-2-VI-B
(2)(vi)(D)......S-2-VI-D
(2)(vi)(E)......S-2-VI-E
(2)(vi)(F)......S-2-VI-F
(2)(vi)(G)......S-2-VI-G
(2)(vi)(H)......S-2-VI-H
(2)(vi)(I) .....S-2-VI-I
(2)(vii)........S-2-VII
(2)(vii)(A).....S-2-VII-A
(2)(vii)(B).....S-2-VII-B
(2)(viii).......S-2-VIII
(2)(viii)(A) ...S-2-VII
(2)(viii)(B)....S-2-VII
(2)(viii)(C)....S-2-VII
(2)(ix)(C)......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-rowspan              'rowspan CDATA #IMPLIED'         >
<!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 "malignmark | 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;
                      %att-globalatts;     >

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

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

<!ENTITY % ctrigop "sin | cos | tan | sec | csc | cot | sinh
                | cosh | tanh | sech | csch | coth
                | arcsin | arccos | arctan" >

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

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

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

<!ELEMENT sec        - o EMPTY       >
<!ATTLIST sec     %att-definition;
```

```
                    %att-globalatts;     >

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

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

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

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

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

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

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

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

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

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

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

<!ENTITY % cstatopnary "mean | sdev | var | median | mode" >

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

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

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

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

<!ELEMENT mode        - o EMPTY       >
<!ATTLIST mode     %att-definition;
```

```
                      %att-globalatts;     >

<!ENTITY % cstatopmoment "moment" >

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

<!ENTITY % clalgop1ary "determinant | transpose" >

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

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

<!ENTITY % clalgopnary "select" >

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

<!-- content elements -  relations  -->

<!ENTITY % cgenrel2ary "neq" >

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

<!ENTITY % cgenrelnary "eq | leq | lt | geq | gt" >

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

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

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

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

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

<!ENTITY % csetrel2ary "in | notin | notsubset | notprsubset" >

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

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

<!ELEMENT notsubset        - o EMPTY       >
<!ATTLIST notsubset     %att-definition;
```

```
                      %att-globalatts;     >

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

<!ENTITY % csetrelnary "subset | prsubset" >

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

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

<!ENTITY % cseqrel2ary "tendsto" >

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

<!-- content elements -  quantifiers  -->

<!ENTITY % cquantifier "lowlimit | uplimit | bvar | degree | logbase" >

<!ATTLIST lowlimit  %att-globalatts;     >

<!ATTLIST uplimit  %att-globalatts;     >

<!ATTLIST bvar     %att-globalatts;     >

<!ATTLIST degree   %att-globalatts;     >

<!ATTLIST logbase  %att-globalatts;     >

<!-- operator groups -->

<!ENTITY % cop1ary "%cfuncop1ary; | %carithop1ary; | %clogicop1ary;
                    | %ccalcop1ary; | %ctrigop; | %clalgop1ary; " >

<!ENTITY % cop2ary "%carithop2ary; | %clogicop2ary;| %csetop2ary; " >

<!ENTITY % copnary "%cfuncopnary; | %carithopnary; | %clogicopnary;
                    | %csetopnary; | %cstatopnary;  | %clalgopnary; " >

<!ENTITY % copmisc "%carithoproot; | %carithop1or2ary; | %ccalcop;
                    | %cseqop; | %cstatopmoment; | %clogicopquant;" >

<!-- relation groups -->

<!ENTITY % crel2ary "%cgenrel2ary;  | %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 pre-determined 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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