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REVISION WORKING GROUP

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CHECKING OF NOTES AND REFERENCES IN THE REFORMED IPC

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1.   At its eighth session, held in November/December 2002, the IPC Revision Working Group briefly discussed potential problems with particular references that appear in entries of the advanced level (AL). The Working Group requested the International Bureau to further investigate such references (see document IPC/WG/8/8, paragraph 40).

2.   The report on this study was posted on the revision list server. The Annex to this document contains said report.

> *3.   The IPC Revision Working Group is invited to consider the report contained in the Annex to this document and to take decisions as appropriate.*

[Annex follows]

ANNEX

ADVANCED LEVEL REFERENCES AND
THEIR IMPLICATIONS ON THE CORE LEVEL

1.   During its last session, held in November/December 2002, the IPC Revision Working Group briefly discussed potential problems with particular references that appear in entries of the advanced level (AL). The Working Group requested the International Bureau to further investigate such references (see document IPC/WG/8/8, paragraph 40).

2.   This study relates to references in entries of the IPC that appear in AL only, i.e. entries that are not present in the core level (CL).

        While entries containing such references will not appear in CL, their references may nevertheless have some impact on the scope of CL groups. As informative references do not affect the scope, they may usually be ignored. However, this is not always the case for limiting references. Some examples will clarify this:

Example 1

        The simplest examples for illustrating the potential problems are precedence references. See, for example, the precedence reference in G01N 27/18 (an advanced level entry):

G01N 27/00 Investigating or analysing materials by the use of electric, electro-chemical, or
            magnetic means
G01N 27/02 . by investigating impedance
G01N 27/04 . . by investigating resistance
…
G01N 27/14 . . . of an electrically-heated body in dependence upon change of temperature

G01N 27/18 . . . . caused by changes in the thermal conductivity of a surrounding material to
            be tested (G01N 27/20 takes precedence)
G01N 27/20 . . . Investigating the presence of flaws

        Even though this precedence reference appears in AL only, it obviously refers to some subject matter that otherwise would be covered by CL group 27/14 to another CL place. The omission of the precedence reference to 27/20 would lead to both wrong classifications and an incorrect information for search purposes. To avoid such problems the reference should be reproduced at the corresponding hierarchically next higher CL entry 27/14.

        Further examples of precedence references can be found in the table of Appendix I.

Example 2

Clearly, this problem potentially concerns all limiting references; another simple example is the limiting reference in G01N 33/28 (an advanced level entry):

G01N 33/00 Investigating or analysing materials by specific methods not covered by the
preceding groups
G01N 33/02 . Food
G01N 33/03 . . Edible oils or edible fats [4]
…
G01N 33/26 . Oils; viscous liquids; paints; inks
G01N 33/28 . . Oils (edible oils or edible fats G01N 33/03)

Again, a limiting reference with regard to edible oils or fats should be reproduced in CL group 33/26. Omitting such a reference could lead to wrong classifications of patents and erroneous searching.

Example 3

The problem might be considered even more important when a reference refers subject matter out to a different main group in the same subclass or even another subclass, see, for example, the limiting reference in G01N 19/08 (an advanced level entry):

G01N 19/00 Investigating materials by mechanical methods
…
G01N 19/08 . Detecting presence of flaws or irregularities (measuring roughness or irregularity of surfaces G01B 5/28)

G01B 5/00 Measuring arrangements characterised by the use of mechanical means
…
G01B 5/28 . for measuring roughness or irregularity of surfaces

Again, omitting that reference in CL could lead to different classifications by examiners using the CL or AL, respectively. Therefore, this reference should be reproduced at the corresponding hierarchically next higher CL entry G01N 19/00.

Further simple examples of limiting references pointing to a different main group are B65B 51/30 (to B65B 9/12) and B65B 13/02 (to A01D 37/00).

3.   This problem, i.e. the limitation of scope of a CL entry by a reference in an AL entry, is independent on whether this reference points to a CL or an AL entry. However, this problem does not affect all limiting references.

Evidently, it concerns all limiting references pointing to different main groups.

In order to clarify which limiting references pointing to places within the same main group will be affected, it is helpful to define the so-called root. The "root" of an AL entry is defined as being the hierarchically next higher entry in CL (for example, for G01N 25/14, it is G01N 25/00). The root is the CL entry where a limiting reference would have to be reproduced.

Obviously, when the root of the entry where the reference is found and the root of the reference are the same, the reference does not have to be reproduced as this would lead to references like

XXXX Y/ZZ …..(XXXX Y/ZZ takes precedence).

Among those cases where roots are different, some but not all limiting references need to be retained in CL. Indeed, such limiting references need not to be reproduced when both roots are placed within the same hierarchical branch and the root of the reference is lower in hierarchy, see, for example, G01N 25/14 (one-dot group 25/02 is lower than 25/00, the root of 25/14), G01N 30/96, G05D 1/10. This is the case because the hierarchically higher place will automatically encompass the subject matter of the hierarchically lower place.

STATISTICS AND EXPECTED WORKLOAD

4.   A survey on such references in different subclasses was conducted and is summarized in Appendix I. This Appendix includes a table listing the AL entries where such references are found (origin), the corresponding place(s) to which the particular reference points (target), and an assessment of their nature, i.e. as to whether they seem to be limiting or informative. This assessment is not always straightforward (as in the case of, for example, precedence references) and sometimes quite difficult requiring some expert knowledge. The assessment given in the table is, therefore, tentative only. A question mark (?) indicates particularly questionable cases.

5.   Regarding the workload, following estimates can be derived:

Given that the total number of IPC entries containing references is 10,265 (see Appendix II), 38% of these entries appearing solely in AL, and each such entry containing in average 2.2 references (these statistics can be derived from the survey given in Appendix I), there are approximately 8,600 references contained solely by AL.

Among these references, the ones belonging to the same hierarchical branch (9%) can automatically be sorted out.

Some others could also automatically be sorted out as their nature can be derived from the occurrence of particular words ("precedence," "similar," "in general,' "per se"; approximately 7%).

Therefore, approximately 7,200 references will require intellectual consideration to determine their nature. Assuming 10 minutes of work per reference, this would amount to 1,200 hours or 150 days of work for a single person.

POSSIBLE APPROACHES

6.   It is evident that detailed intellectual consideration of many references will be necessary. As a first step, the references requiring such individual consideration should be sorted out by some automatic algorithm implemented on a computer (see Appendix III). The subsequent intellectual consideration consists in 1) assessing the nature of a reference as being limiting or informative and 2) determining if and how the former ones should be reproduced in CL. Step 1 is work that will have to be done also in the context of deleting any informative references in the IPC scheme, a task being envisaged by the IPC Revision Working Group for later versions of the IPC scheme (the Working Group decided to dispense with all informative references in the scheme itself and retain them in the definitions only). Step 2 will also have to be done for limiting references that were automatically identified.

7.   However, due to resource limits and in view of the close deadline of the CL publication in 2004, the full intellectual consideration will be hardly achievable by then. The following approaches could be envisaged for the preparation of the CL of the IPC:

      (a)   As the number of such references is so large, ignore all of them for the next CL version.

            This is the easiest solution as it does not entail any further work until the next IPC edition. However, it will require informing classifiers classifying in CL only to consult the AL version of the IPC scheme as the missing limiting references may cause wrong classifications of documents in the CL.

      (b)   Provisionally reproduce all of them (after the automatic sorting out of obviously informative references) at the according root in an automatic manner.

            This would avoid any intellectual work to be done. Only the algorithm for automatically identifying potentially limiting references will have to be established and run.

            For the automatic reproduction, two approaches are possible:

       (i)   Reproduce the symbol only.

            That could only be a provisional measure due to limited time available for individual consideration of respective references. It would require notifying the CL user that such references could be either limiting or informative and that he should consult the AL scheme or definitions for details. This provisional representation should then be replaced in the next CL version.

      (ii)   Reproduce the symbol plus the relevant text.

            This is not as easily done as it appears; some references will require to reproduce the full text preceding the reference, including the titles of the same group and hierarchically higher groups as the references could otherwise not be correctly interpreted; see, for example, H01H 5/04 (at least "energy stored" should precede the wording of the reference).

However, an automatic approach allows two alternatives only:

–   omitting all preceding text, which will render many references unclear; or

–   automatic reproduction of all preceding text (i.e. the titles of all preceding hierarchically higher groups of the same branch), which will result in very lengthy references.

(c)   Carry out intellectual consideration of all references individually before IPC-2005.

This would require some substantial joint effort by all offices in sharing the work and cross-checking the results obtained by others. As in some cases it is not straightforward to determine the nature of a reference, some time-consuming discussions can be foreseen.

[Appendix I follows]

APPENDIX I

SURVEY ON REFERENCES IN ADVANCED LEVEL (AL) ENTRIES

Only AL entries contained solely by AL were considered.

Summary:

Total number of entries with references:	122	
Total number of references:	308	
Number of references with different root in CL:	164 (54% out of 308)	
Same hierarchical branch:	15 (9% of 164)	
Limiting references:	67 (40%)	
Informative references:	68 (41%)	

Total number of references in CL entries:	402
Total number of CL entries with references:	201

The number of limiting references does not include the number of same branch references which usually also are limiting in nature.

The following table lists the 164 AL entries and associated references whose CL roots are different (for example, the root of G01N 3/12 is G01N while the root of G01M 3/00 is G01M 3/00).

Origin	Target	
G01N 3/12	G01M 3/00	Informative
G01N 13/10	G01N 23/22 G01B G12B 21/00	Limiting Limiting Informative
G01N 19/08	G01B 5/28	Limiting
G01N 21/07	B04B	Informative
G01N 21/51	B08B 9/46	Limiting
G01N 21/67	H01T	Informative
G01N 21/956	G01R 31/108 G07D	Limiting Limiting (G07D 7/12)
G01N 25/14	G01N 25/02	Precedence; same branch
G01N 27/10	G05D	Informative
G01N 27/18	G01N 27/20	Precedence
G01N 30/96	G01N 30/02	Precedence; same branch
G01N 31/18	B01L 3/02	Informative

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Origin	Target	
G01N 33/28	G01N 33/03	Limiting
		G01N: 48 references in AL groups 16 references with different root (33%) 8 limiting 6 informative 2 same branch 75 CL groups with references 159 references in CL groups
G05D 1/10	G05D1/12	Precedence; same branch
G05D 13/30	F15B 5/00	Informative
G05D 13/34	F15B 3/00	Informative
G05D 16/02	F16F 7/00	Informative (?)
G05D 23/08	F16K 11/00	Limiting (?)
G05D 23/10	F16K 31/56	Limiting (?)
		G05D: 8 references in AL groups 6 references with different root (75%) 2 limiting 3 informative 1 same branch 9 CL groups with references 16 references in CL groups
G01S 1/72	G08B	Informative
G01S 1/76	G10K 11/34	Informative?
G01S 3/06	G01S 3/16 G01S 3/28 H01Q	Limiting; same branch Limiting; same branch Limiting?
G01S 3/12	G01S 3/24 G01S 3/34	Limiting; same branch Limiting; same branch
G01S 3/58	G01S 3/14	Obsolete, to be deleted
G01S 3/68	G01S 7/10	Limiting?
G01S 3/74	G01S 3/04 G01S 3/14	Limiting; same branch Limiting; same branch
G01S 3/802	G10K 11/34	Informative
G01S 5/28	G01S 7/62	Limiting?
G01S 7/499	G01J	Informative
G01S 11/08	G04G 7/02	Informative

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Origin	Target	
G01S 13/04	G01S 13/56	Limiting; same branch
G01S 13/10	G01S 13/32	Limiting; same branch
G01S 13/524	G01S 7/288	Limiting
G01S 13/78	G01S 13/75 G01S 13/79	Precedence Precedence; (to be deleted)
		G01S: 28 references in AL groups 20 references with different root (71%) 6 Limiting 5 Informative 8 same branch 24 CL groups with references 47 references in CL groups
H01H 1/58	H01R	informative
H01H 1/64	H01H 9/30 H01H 29/04	Limiting Limiting; (redundant, see 1/00)
H01H 3/04	H01H 23/14	Limiting
H01H 3/28	H01H 45/00	Limiting
H01H 3/32	H01H 5/00 H01H 7/00	Limiting Limiting
H01H 3/62	H01H 1/60	Limiting
H01H 5/04	H01H 37/54	Limiting
H01H 7/06	H01H 37/00	Informative
H01H 7/16	H01H 9/56	Limiting
H01H 9/10	H02B	Limiting
H01H 9/28	H01H 27/00 H01R	Limiting Informative
H01H 9/46	H01T 4/14	Informative
H01H 9/52	H01H 1/62	Limiting
H01H 13/22	H01H 13/26	Limiting
H01H 13/68	H01H 15/22	Limiting
H01H 29/32	H01H 53/00	Limiting
H01H 31/04	H01H 33/52	Informative (sufficient ref in title already present)
H01H 31/10	H01H 33/52	Informative (as above)

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Origin	Target	
		H01H (until main group 31/00 only) 36 references in AL groups 21 references with different root (58%) 15 Limiting 6 Informative 0 same branch 14 CL groups with references 27 references in CL groups
B65B 1/02	B65B 9/00	Limiting
B65B 1/28	B65B 55/24	Informative
B65B 1/32	G01G	Informative
B65B 1/36	G01F	Informative
B65B 1/46	G01G	Informative
B65B 3/28	G01G	Informative
B65B 3/30	G01F	Informative
B65B 5/02	B65B 9/00	Limiting
B65B 9/12	A22C 11/00	Limiting (application)
B65B 11/50	B65B 47/00	Informative (better to be kept)
B65B 11/56	B65B 21/26	Limiting (correspondence)
B65B 13/02	A01D 37/00 A01D 39/00 A01D 59/00 A01F 1/00 A01F 15/14 B30B 9/30 E01B 31/28	Limiting (application) Limiting (application) Limiting (application) Limiting (application) Limiting (application) Limiting? Limiting
B65B 15/02	A44B 7/00	Informative
B65B 19/28	B65B 57/00	Informative
B65B 21/12	B25J	Informative
B65B 21/18	B25J	Informative
B65B 21/26	B65B 11/56	Informative (correspondence)
B65B 23/08	A01K 43/00 A47J 29/06	Informative Limiting
B65B 23/12	A21C 15/00	Limiting
B65B 25/04	A01D 33/10	Limiting
B65B 25/18	A21C 15/04 B26B B26D	Informative Informative Informative

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Origin	Target	
B65B 27/12	A01F 15/00 B30B 9/30	Limiting Limiting?
B65B 37/16	B65B 1/30 B65B 3/26	Limiting Limiting
B65B 51/02	B65B 51/10	Limiting, same branch
B65B 51/04	B65B 7/28	Limiting
B65B 51/06	B65H 35/07	Informative
B65B 51/24	B65B 61/10	Limiting
B65B 51/30	B65B 9/12	Limiting
B65B 57/20	B65B 65/08	Informative
B65B 59/02	B65B 1/30 B65B 3/26	Informative Informative
B65B 61/14	B65B 29/04	Limiting
B65B 63/02	B30B 11/00	Limiting
B65B 63/04	B65H 45/00 B65H 54/00 D06F 89/00	Informative Informative Limiting
		B65B 58 references in AL groups 47 references with different root (81%) 24 limiting 22 informative 1 same branch 31 CL groups with references 59 references in CL groups
A23C 1/14	A23C 3/00 A23C 9/00	Precedence Precedence
A23C 3/08	A23C 9/12 A23C 9/152	Informative? Informative
A23C 7/02	B08B B08B 3/08 A61L	Informative Informative Informative
A23C 7/04	A01J 9/02 A01J 11/06	Limiting Limiting
A23C 9/15	A23C 9/154 A23C 21/06	Limiting; same branch Limiting
A23C 9/16	A23C 1/05	Precedence
A23C 11/02	A23C 19/055 A23C 21/04	Precedence Precedence
A23C 13/12	A23G 9/00	Limiting

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Origin	Target	
A23C 19/09	A23C 19/097	Limiting; (obsolete as ref in root)
		A23C: 36 references in AL groups 16 references with different root (44%) 7 limiting 5 informative 1 same branch 13 CL groups with references 30 references in CL groups
F16D 1/116	F16B 21/18	Informative
F16D 1/12	F16D 3/10	Limiting
F16D 3/26	F16D 3/20	Same branch
F16D 3/80	F16D 31/00 F16D 35/00	Limiting Limiting (see note before 1/00; therefore, possibly obsolete)
F16D 3/82	F16D 25/04	Informative (similar)
F16D 7/04	F16H 33/08	Informative (similar)
F16D 13/04	F16D 43/00	Limiting?
F16D 13/08	F16D 41/20 F16D 49/02	Informative (similar) Informative (similar)
F16D 13/10	F16D 49/00	Informative (similar)
F16D 13/12	F16D 51/02	Informative (similar)
F16D 13/14	F16D 51/00	Informative (similar)
F16D 13/20	F16D 53/00	Informative (similar)
F16D 13/22	F16D 55/00	Informative (similar)
F16D 13/62	F16D 65/00	Informative
F16D 21/02	B62D	Limiting
F16D 21/08	F16D 13/08 F16D 13/12	Precedence Precedence
F16D 23/12	F16D 21/00 F16D 23/02	Limiting Same branch
F16D 25/04	F16D 3/82	Informative
F16D 25/10	B60K 17/00	Informative?
F16D 33/16	B60K 23/00 B60K 23/02	Informative Informative
F16D 33/18	F16H 41/24	Limiting
F16D 43/04	F16D 37/00	Limiting?
F16D 43/202	F16D 7/04	Informative

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Origin	Target	
F16D 43/26	F16D 11/02 F16D 13/02 F16D 15/00 F16H 59/00 F16H 63/00	Limiting Limiting Limiting Informative Informative
F16D 47/04	F16D 41/04 F16D 41/26	Limiting Limiting
F16D 49/02	F16D 13/08	Informative (similar)
F16D 51/02	F16D 13/12	Informative (similar)
F16D 65/34	H02N 13/00	Informative
		94 references in AL groups 38 references with different root (40%) 15 Limiting 21 Informative 2 same branch 35 CL groups with references 64 references in CL groups

[Appendix II follows]

APPENDIX II

REFERENCES BETWEEN SECTIONS

In the table given below, the figures are the numbers of entries where a reference can be found and not the number of references. This table has been established using IPC:CLASS.

From/To	A	B	C	D	E	F	G	H
A	745	154	22	23	55	50	42	13
B	196	2124	73	89	131	140	104	30
C	31	94	508	13	30	44	10	8
D	29	45	16	312	5	4	3	1
E	54	96	4	4	672	42	416	6
F	69	217	25	18	88	1360	63	21
G	52	152	2	11	35	81	926	74
H	21	51	3	5	6	34	146	817

Total: 10,265

[Appendix III follows]

APPENDIX III

ALGORITHM FOR SORTING ADVANCED LEVEL (AL)
ENTRIES WITH REFERENCES

The following algorithm should be implemented for automatically locating and listing all advanced level (AL) entries containing references that need special consideration for their reproduction in the core level (CL).

The term "root" of an AL entry is defined as being the hierarchically next higher entry in CL (for example, for G01N 25/14, it is G01N 25/00).

The *logical flow* should be the following:

1.   Find AL entry with any reference to either CL or AL;

2.   Determine
root of reference in CL (RRef), and
root in CL of this entry (REnt)
(if a reference is part of CL it is considered to be its own root);

3.   Compare RRef and REnt

├equal → no further action
└not equal
        ├different main group → save (for later intellectual consideration)
                                possibly separated in two categories
                                same/different subclass

        └same main group
                ├ hierarchical level (HL) of RRef equal or higher than Rent → save
                └ HL of RRef lower → no further action.

An example for the hierarchical checking in the last step is G01N 15/14 where RRef is G01N 25/02 (one dot) which is lower in hierarchy than REnt (G01N25/00).

Each "save" step could/should additionally include a further check regarding the presence of particular terms in the references, for example "takes precedence" would qualify them immediately as limiting , or "similar xxx" would qualify them as informative.

As *output*, the procedure should provide lists of findings of the different steps of the above scheme:

1.   A list of all AL entries which solely appear in AL and have references; the list should include entry plus references;

2.   A list of all such AL entries where RRef and REnt are different;

3.   Lists of such entries that automatically qualify as limiting ("precedence") or informative ("similar," "per se," "in general");

4.   A list of all entries that were automatically sorted out due to the hierarchical criterion;

5.   A list of all such entries that need final intellectual consideration as to whether they are limiting or informative; this list should/could consist of separate lists: entries with references to other subclasses, different main groups, same main group.

As list 2 contains all entries listed in either lists 3, 4, or 5, all entries in list 2 could/should be automatically be marked according to their category.

[End of Annex and of document]