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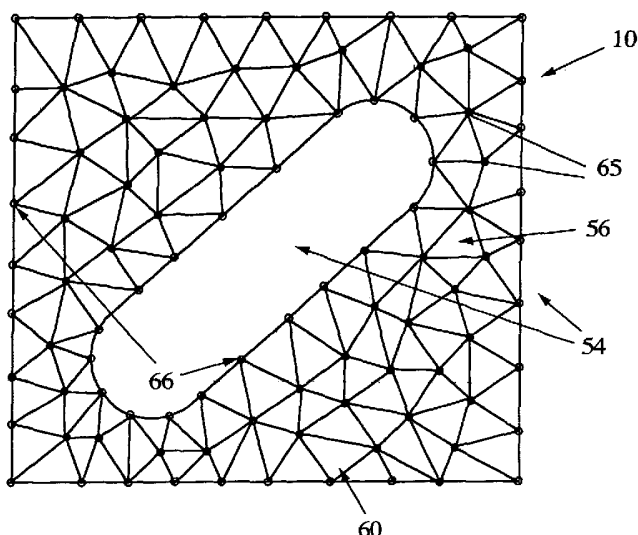
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(54) Title: AUTOMATED TRANSLATION OF HIGH ORDER COMPLEX GEOMETRY FROM A CAD MODEL INTO A SUR-
FACE BASED COMBINATORIAL GEOMETRY FORMAT



(57) Abstract: A computer implemented process translates the high order complex geometry embodied in CAD software to the surface based combinatorial geometry (SBCG) format. The translation process is comprised of a set of lower-level algorithms that operate on two data sets which are commonly available from commercial CAD software systems. The process writes a list of trimmed surfaces (step 36) which make up a given part. These data are typically available from one of the standard geometry representations such as IGES, STEP, or ACIS. The process also writes a list of nodal data (step 38) : an appropriately dense grouping of point coordinates, designated as either inside or outside the part. These data may be obtained by discretizing solid geometry both within and external to the part of interest using standard FE tools (e.g. ProMechanica). The process translates these two data sets into a list of analytic surfaces and a well-posed zoning statement (step 40) and then optimizes that statement (step 50).

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RAGHOTHAMA S ET AL: "Consistent updates in dual representation systems" COMPUTER AIDED DESIGN, ELSEVIER PUBLISHERS BV., BARKING, GB, vol. 32, no. 8-9, August 2000 (2000-08), pages 463-477, XP004203521 ISSN: 0010-4485 abstract page 465, column 1, paragraph 6 page 465, column 2, paragraph 4 page 466, column 1, paragraph 1 page 466, column 2, paragraph 5 page 469, column 1, paragraph 2 figures 4,5 ----- -/--	1-11

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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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X	VADIM SHAPIRO ET AL: "SEPARATION FOR BOUNDARY TO CSG CONVERSION" ACM TRANSACTIONS ON GRAPHICS, ASSOCIATION FOR COMPUTING MACHINERY, NEW YORK, US, vol. 12, no. 1, January 1993 (1993-01), pages 35-55, XP000345444 ISSN: 0730-0301 abstract page 36, paragraph 3 - page 38, paragraph 2 page 41, paragraph 3 - page 42, paragraph 5 figures 1-4	1-11
Y	BUCHELE S F, ROLES A C: "Binary space partition tree and constructive solid geometry representations for objects bounded by curved surfaces" CCCG-HOMEPAGE, 'Online! 2001, pages 1-6, XP002309688 WATERLOO, CA, USA Retrieved from the Internet: URL: http://web.archive.org/web/20011001122956/http://compgeo.math.uwaterloo.ca/{cccg01/proceedings/long/bucheles-51141.ps > 'retrieved on 2004-08-12! abstract; figure 1	1-11
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ANONYMOUS: "TART 95 MANUAL - chapters 1-4" LAWRENCE LIVERMORE NATIONAL LABORATORY HOMPAGE, 'Online! 1996, pages 1-79, XP002309801 Retrieved from the Internet: URL: http://web.archive.org/web/20030511171043/http://www-phys.llnl.gov/N_Div/TART/TA_RT_Contents.html> 'retrieved on 2004-12-09! the whole document -----	1-11
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5537519	A	16-07-1996	NONE	