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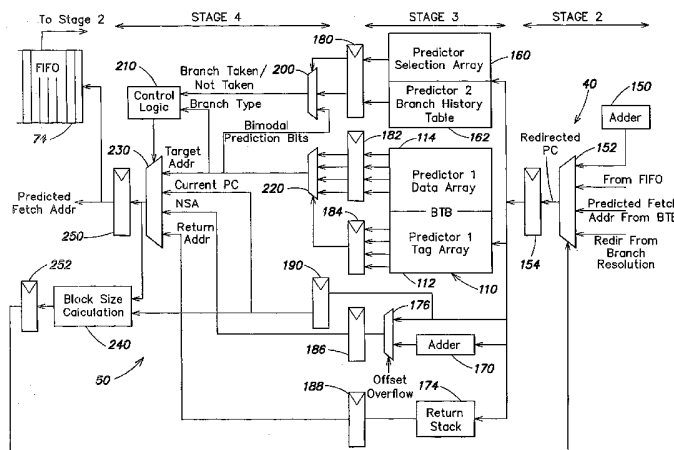
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(54) Title: METHOD AND APPARATUS FOR BRANCH PREDICTION BASED ON BRANCH TARGETS



(57) Abstract: Methods and apparatus are provided for branch prediction in a digital processor. A method includes providing a branch target buffer having a tag array and a data array, wherein each entry in the tag array provides an index to a corresponding entry in the data array, storing in a selected entry in the tag array information representative of a branch target of a current branch instruction, storing in a corresponding entry in the data array information representative of a branch target of a next branch instruction, and providing the information representative of the branch target of the next branch instruction in response to a match to an entry in the tag array. The information representative of the branch target of the next branch instruction may include a taken branch target address of the next branch instruction and an offset value. The offset value may represent an address of a next sequential instruction following the next branch instruction.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G06F9/38				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 G06F				
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				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	REINMAN G ET AL: "A SCALABLE FRONT-END ARCHITECTURE FOR FAST INSTRUCTION DELIVERY" PROCEEDINGS OF THE 26TH INTERNATIONAL SYMPOSIUM ON COMPUTER ARCHITECTURE. ATLANTA, GA, MAY 2 - 4, 1999, INTERNATIONAL SYMPOSIUM ON COMPUTER ARCHITECTURE, (ISCA), LOS ALAMITOS, CA : IEEE COMP. SOC, US, vol. CONF. 26, 2 May 1999 (1999-05-02), pages 234-245, XP000887621 ISBN: 0-7695-0171-0	1-5, 8-22, 26-29		
Y	section 4.2: "Fetch Target Buffer" figures 1,2 ----- -/--	30-33		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. </td> <td style="width: 50%; border: none;"> <input checked="" type="checkbox"/> Patent family members are listed in annex. </td> </tr> </table>			<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/> Patent family members are listed in annex.
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/> Patent family members are listed in annex.			
° Special categories of cited documents :				
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; vertical-align: top;"> *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed </td> <td style="width: 50%; border: none; vertical-align: top;"> *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family </td> </tr> </table>			*A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family
A document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the international filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the international filing date but later than the priority date claimed	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family			
Date of the actual completion of the international search <p style="text-align: center;">6 October 2005</p>		Date of mailing of the international search report <p style="text-align: center;">18/10/2005</p>		
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer <p style="text-align: center;">Daskalakis, T</p>		

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	the whole document	30-33
X	US 6 185 675 B1 (KRANICH UWE ET AL) 6 February 2001 (2001-02-06) abstract column 12, line 21 - column 14, line 24 column 16, line 54 - column 17, line 48 column 22, line 21 - line 42	1-5, 8-22, 26-29

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