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- (71) Applicant (for all designated States except US): **THE TIMKEN COMPANY** [US/US]; 1835 Dueber Avenue, South West, Canton, OH 44706-0930 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **BURNETT, Michael, E.** [US/US]; 400 E. Carrollton Street, Magnolia, OH 44643 (US). **IVES, Jeffrey, E.** [US/US]; 2668 Country Squire Street, Uniontown, OH 44685 (US).
- (74) Agents: **BALDAUF, Kent, E.** et al.; The Webb Law Firm, 436 Seventh Avenue, 700 Koppers Building, Pittsburgh, PA 15219-1845 (US).
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**Declarations under Rule 4.17:**

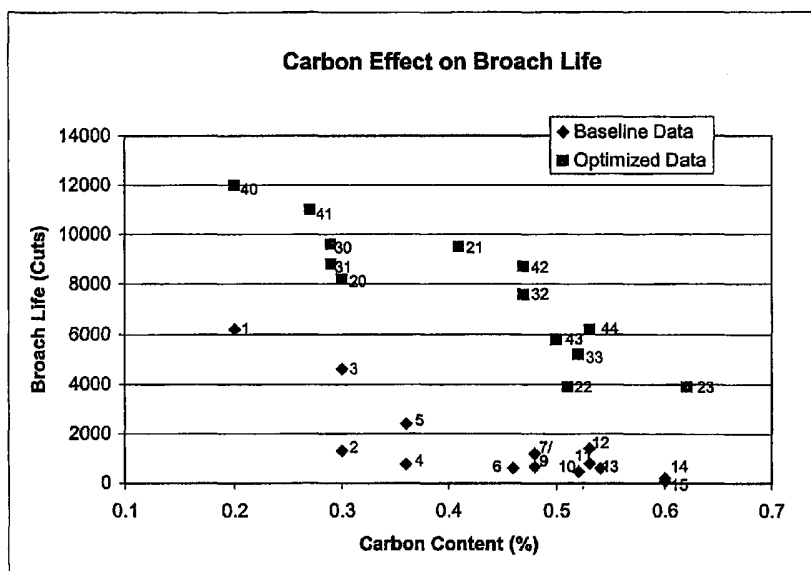
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
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[Continued on next page]

(54) Title: OPTIMIZATION OF STEEL METALLURGY TO IMPROVE BROACH TOOL LIFE



(57) Abstract: A steel for use as a broachable workpiece having a substantially pearlite-free microstructure whereby the service life of the broach tool is maximized. Formation of pearlite is suppressed by alloy modification; on-line processing; off-line processing; or combinations of these techniques which control the microstructure and hardness levels. The workpiece is broached into the form of a powertrain component such as, for example, a gear or race which can be surface hardened after broaching by one of carburizing, nitriding, or induction hardening depending upon the carbon content of the steel. Disclosed are steel compositions and processing methods for making the steel, the broachable workpiece and the broached and surface hardened powertrain article.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> C22C38/00      B23F1/08		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) C22C    B23F		
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, COMPENDEX, WPI Data, INSPEC, CHEM ABS Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	J.R. DAVIS ET. AL.: "Metals Handbook, 9th Ed., vol. 16 Machining" 1989, ASM INT., OHIO, USA, XP002364756 ISBN: 0-87170-007-7	1-21
A	pages 206-211; tables 3-5 -----	22-40
X	J.R. DAVIS ET. AL.: "ASM Specialty Handbook - Carbon and alloy steels" 1996, ASM INT., OHIO, USA, XP002364757 ISBN: 0-87170-557-5	1-21
A	pages 12-27; tables 4-6,13-15 pages 90-101; figure 16; table 6 pages 591-598 ----- -/--	22-40
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents :		
*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	
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X	US 3 258 372 A (MILLER OSCAR O ET AL) 28 June 1966 (1966-06-28) column 2, lines 1-9 -----	17-20
X	US 5 041 167 A (MIWA ET AL) 20 August 1991 (1991-08-20) column 8, lines 7-51; figures 1-6; tables 1,2 column 5, line 44 - column 6, line 8 -----	1-40
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