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Stevens [US/US]; 324 Spring Street, Manitou Springs, CO
80829 (US).

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(74) Agents: **BLAKELY, Roger, W.** et al.; Blakely, Sokoloff,
Taylor & Zafman, 12400 Wilshire Blvd., 7th Floor, Los
Angeles, CA 90025-1026 (US).

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(71) Applicant (for all designated States except US): **STUR-**
MAN INDUSTRIES, INC. [US/US]; One Innovation
Way, Woodland Park, CO 80863 (US).

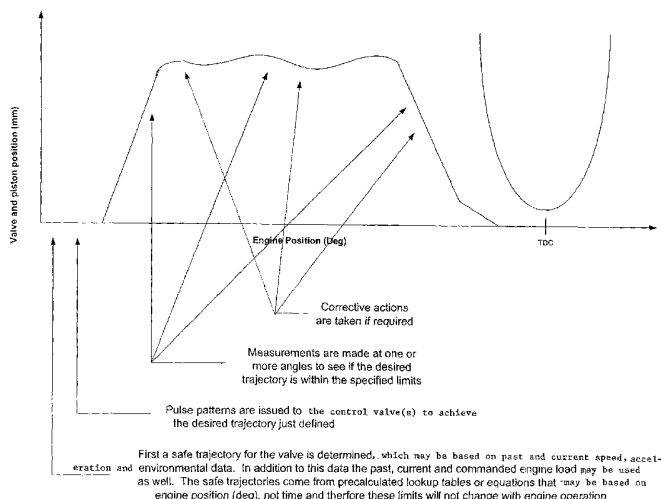
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(72) Inventors; and

(75) Inventors/Applicants (for US only): **BABBITT, Guy,**
Robert [US/US]; 546 W. Boulder Street, Colorado
Springs, CO 80905 (US). **BALTON, Christopher,**

[Continued on next page]

(54) Title: METHODS OF CONTROLLING A CAMLESS ENGINE TO PREVENT INTERFERENCE BETWEEN VALVES AND PISTONS



(57) Abstract: Methods of controlling a camless engine to prevent interference between engine valves and engine valves and pistons. The methods utilize one or more safe trajectories for the valves versus engine crankshaft angle. In normal operation, an engine valve control system monitors crankshaft angle and controls the engine valve so as to stay on the safe side trajectory. In the event the actual valve motion deviates excessively from the intended trajectory so as to reach or cross the safe trajectory, preventive action is taken, typically to command the engine valve to close. Safe trajectories may be stored in lookup tables, in equation form or both. In some cases a single safe trajectory for a valve may be sufficient, through in other cases, safe trajectories as a function of some engine operating conditions and environmental conditions, and in some cases may include crankshaft acceleration. Various embodiments are disclosed.



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A. CLASSIFICATION OF SUBJECT MATTER

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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)

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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, PAJ, WPI Data

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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 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

Libeaut, L

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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