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(54) Title: TURBOCHARGER WITH TURBINE NOZZLE VANES AND AN ANNULAR ROTARY BYPASS VALVE

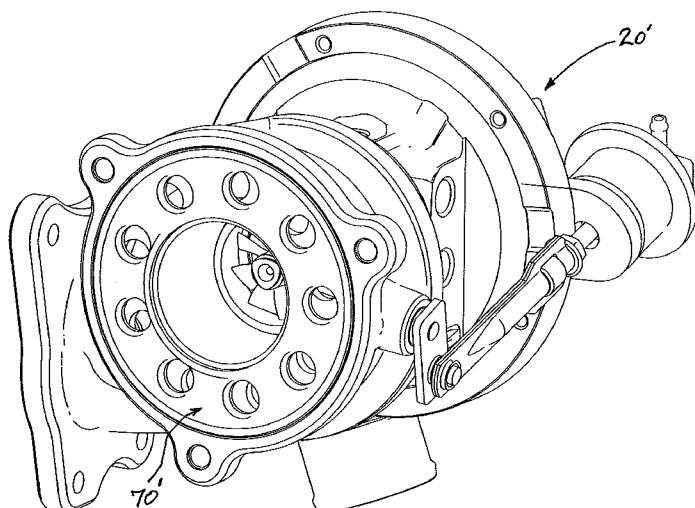


FIG. 9

(57) Abstract: A turbocharger includes an annular bypass passage to allow exhaust gas to bypass the turbine wheel. An annular bypass valve is disposed in the bypass passage. The bypass valve comprises a fixed annular valve seat and a rotary annular valve member arranged coaxially with the valve seat. The valve member is disposed against the valve seat and is rotatable about the axis for selectively varying a degree of alignment between respective orifices in the valve seat and valve member. The turbine includes a nozzle having a vane assembly. In one embodiment the vane assembly has only fixed vanes. In another embodiment the vane assembly includes both fixed vanes and variable vanes, and the variable vanes are part of a rotor that rotates together with the rotary valve member.



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B. FIELDS SEARCHED

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

eKOMPASS(KIPO internal) & Keywords: turbocharger,supercharger,bypass,valve,wastegate,annular

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 09-222024 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD) 26 August 1997 See the abstract, paragraphs [0018],[0019] and figs.1,2	1-14
A	US 7644585 B2 (HAUGEN, DAVID JAMES) 12 January 2010 See column 6, lines 39-55, and figs.2,5,6A,6B	1-14
A	US 2003-0029168 A1 (ROBERT L. HERCEY et al.) 13 February 2003 See paragraphs [0016],[0017], and fig.2	1-14
A	JP 10-103069 A (ISHIKAWAJIMA HARIMA HEAVY IND CO LTD) 21 April 1998 See the abstract, and fig.1	1-14
A	EP 0401615 A1 (ALLIEDSIGNAL INC.) 12 December 1990 See the abstract, and fig.1	1-14

 Further documents are listed in the continuation of Box C. See patent family annex.

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