



US005233831A

United States Patent [19]

[11] Patent Number: **5,233,831**

Hitomi et al.

[45] Date of Patent: **Aug. 10, 1993**

[54] EXHAUST CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

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[73] Assignee: Mazda Motor Corporation, Hiroshima, Japan

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[21] Appl. No.: 906,290

[57] ABSTRACT

[22] Filed: Jun. 29, 1992

[30] Foreign Application Priority Data

Jun. 28, 1991 [JP] Japan 3-159114
Jan. 31, 1992 [JP] Japan 4-042114
Feb. 5, 1992 [JP] Japan 4-054249

An exhaust control system has a first catalytic device disposed in an exhaust line and a second catalytic device, which is smaller in capacity than the first catalytic device, disposed in the exhaust line upstream from the first catalytic device. The system includes a shutter device disposed in the exhaust line upstream from the first catalytic device. The shutter device is caused, by a controller, to close the exhaust line during a predetermined period from a start of engine cranking, before an engine is warmed up, and open the exhaust line after the engine is warmed up, thereby promoting activation of the catalytic devices.

[51] Int. Cl.⁵ F01N 3/28

[52] U.S. Cl. 60/284; 60/292; 60/300; 123/90.15; 123/323; 123/339

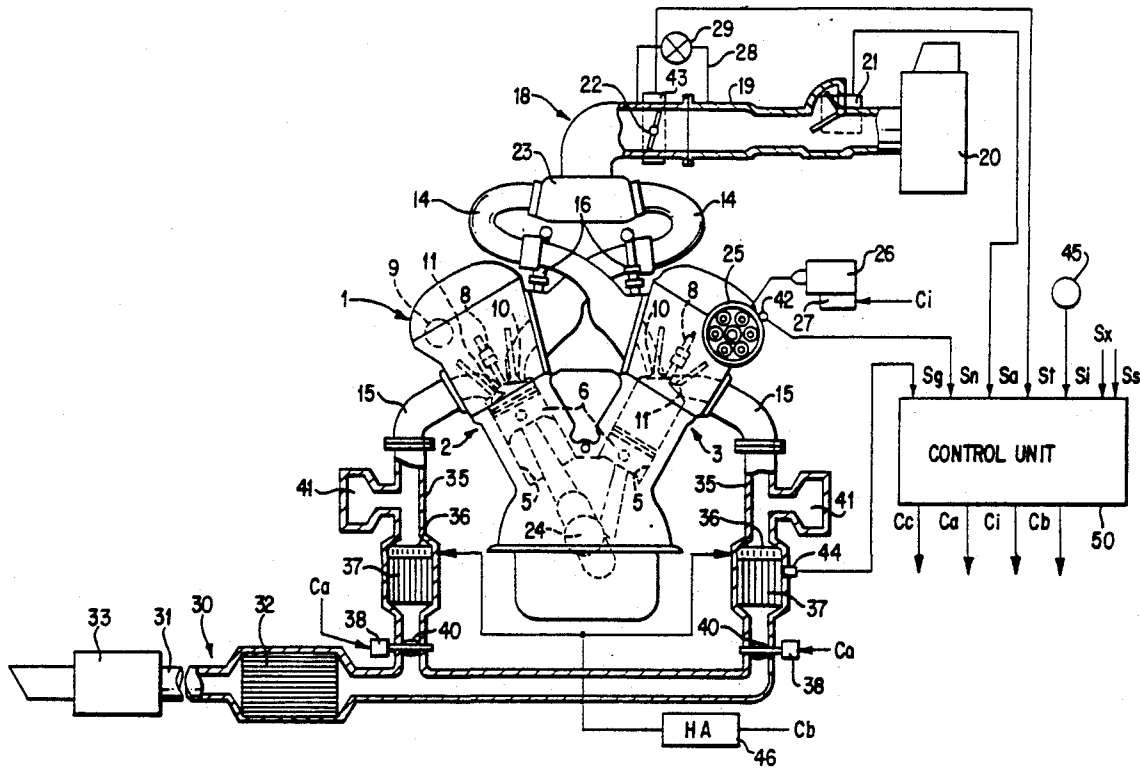
[58] Field of Search 60/284, 292, 300; 123/339, 323, 90.15

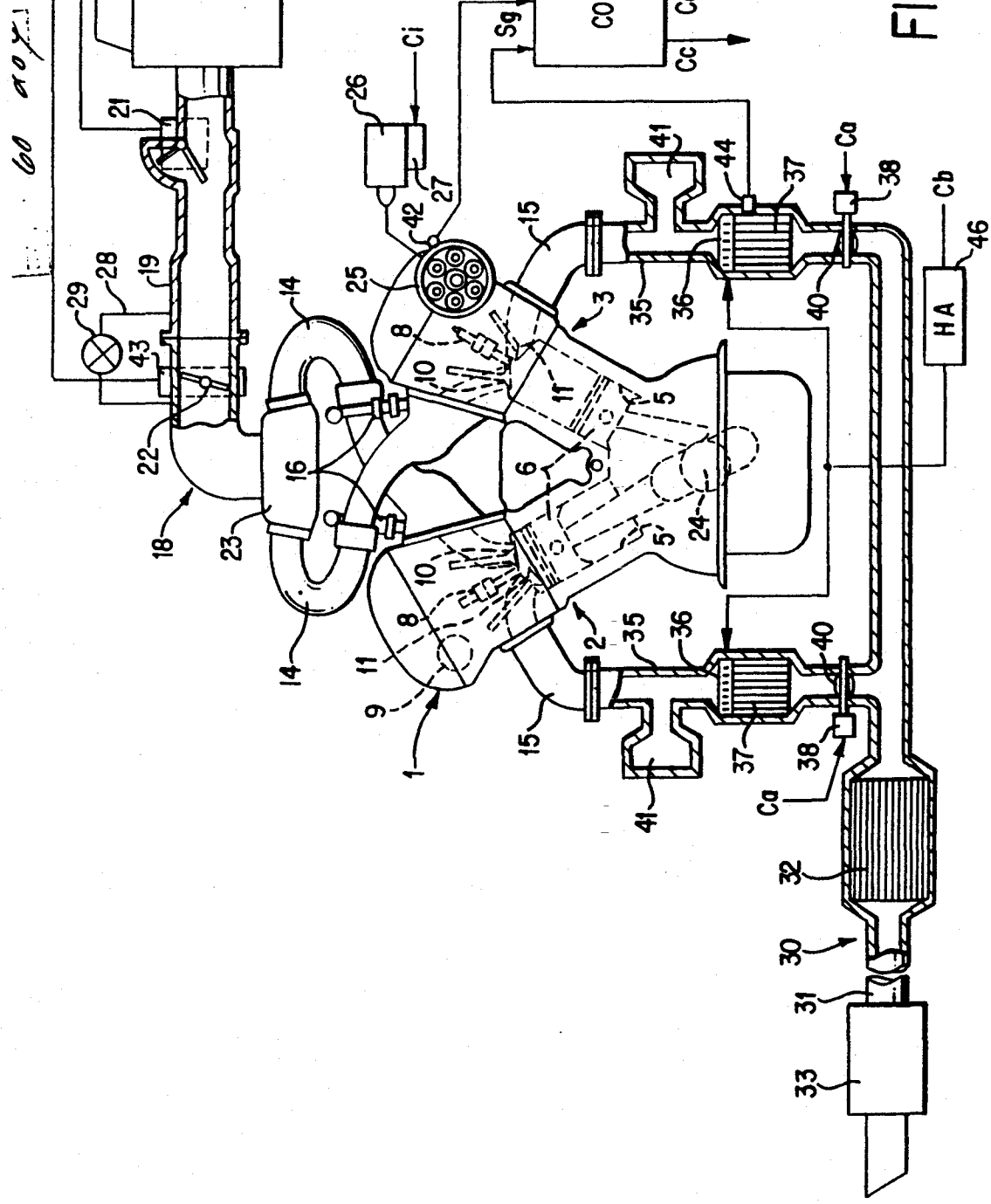
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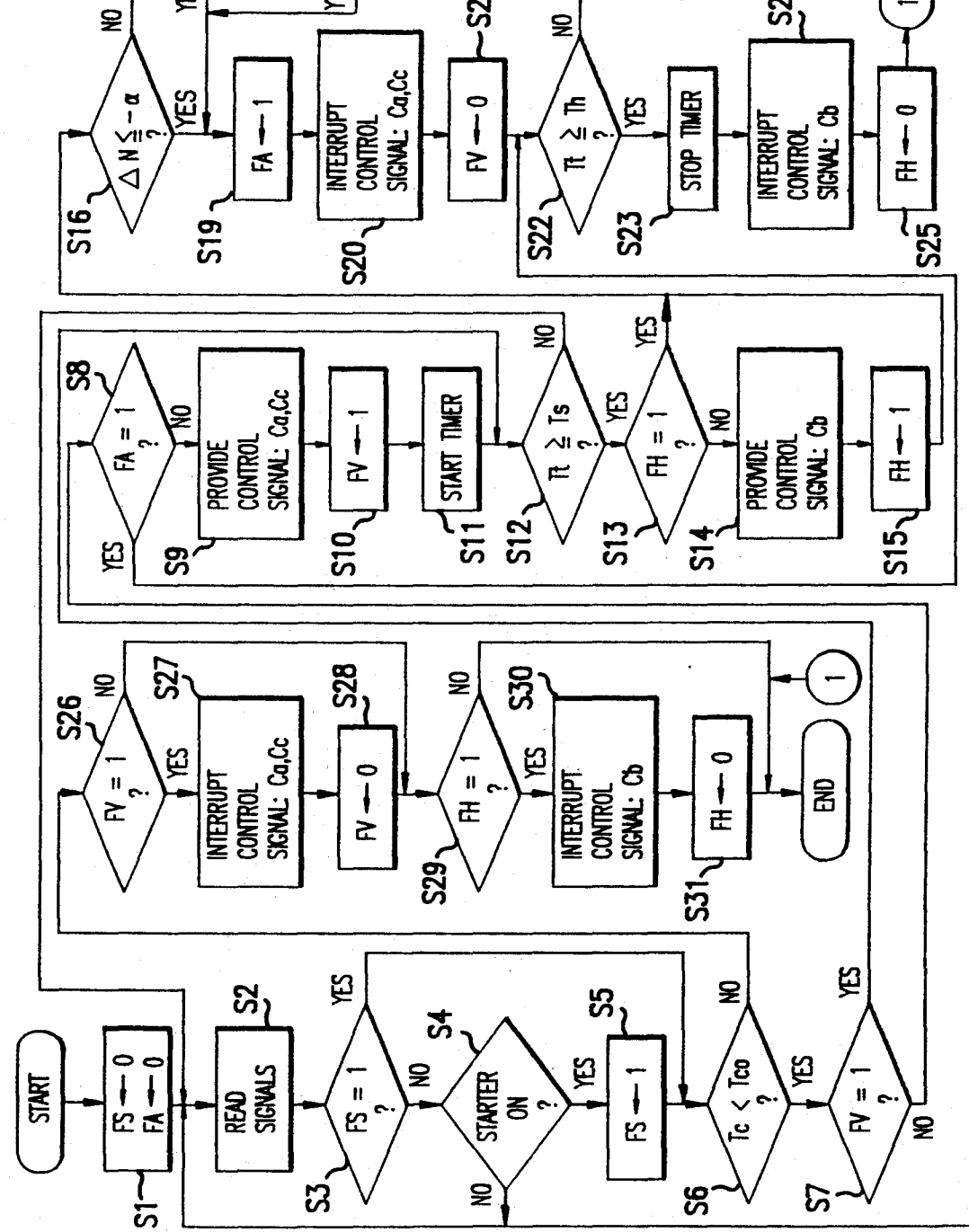
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21 Claims, 9 Drawing Sheets







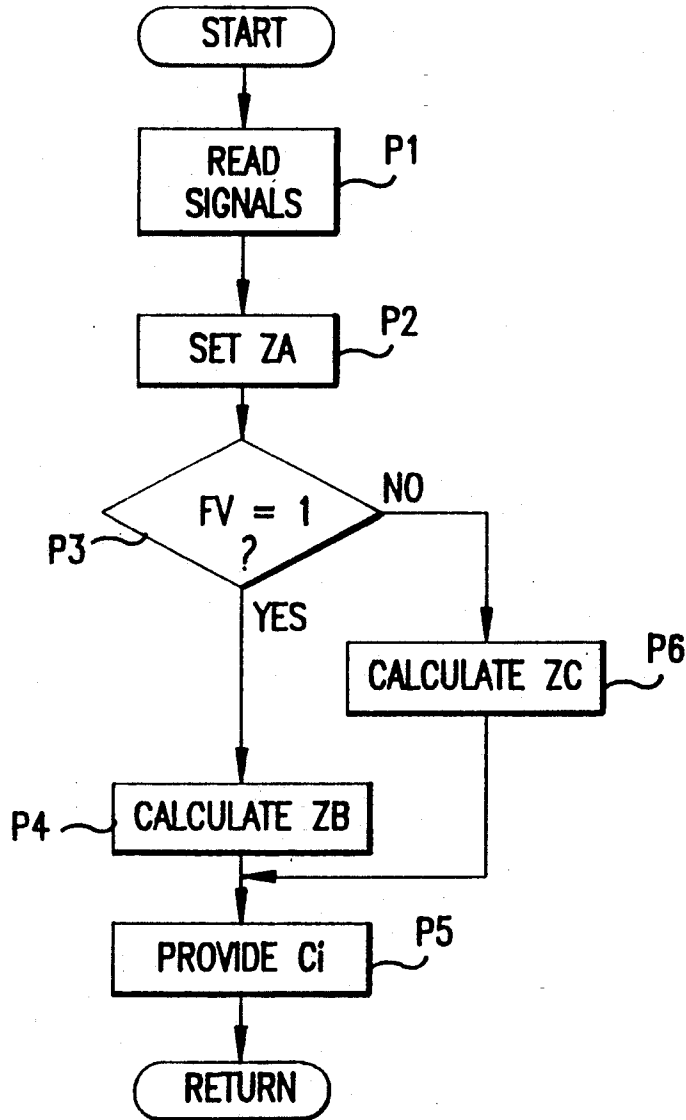


FIG. 3

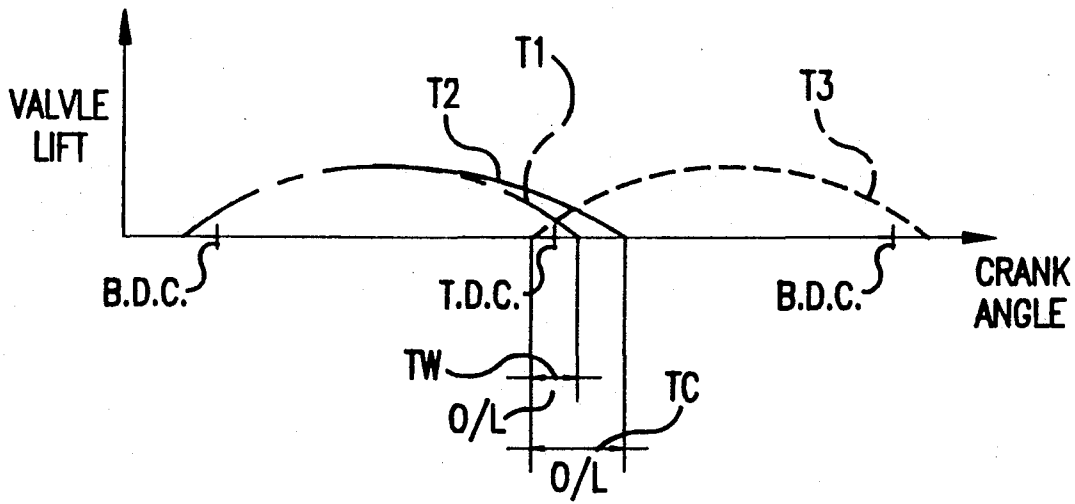


FIG.4

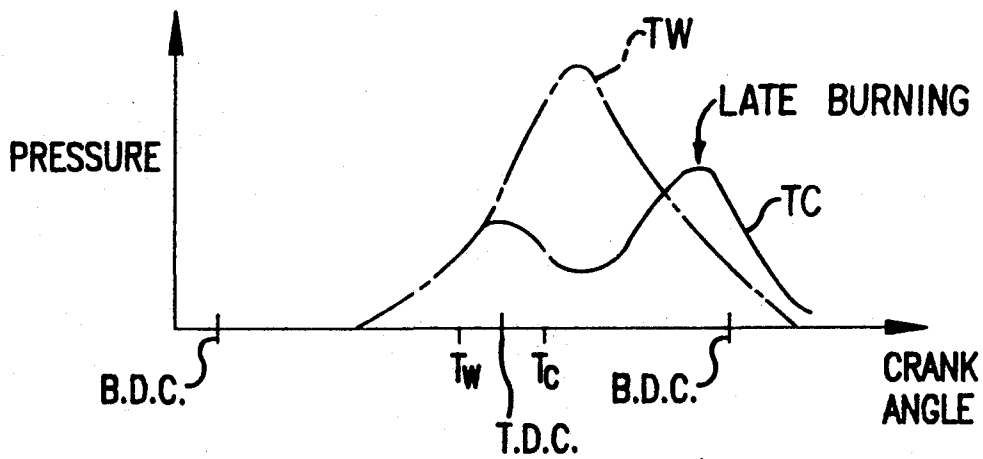


FIG.5

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