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### United States Patent [19]

Wakashiro et al.

[54] EVAPORATIVE EMISSION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

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[21] Appl. No.: 335,373

[22] Filed: Nov. 3, 1994

[30] Foreign Application Priority Data

-	-		•		
1	Nov. 4,	1993	[JP]	Japan	 5-298931
	-				
[52	2] U.	S. Cl.			 123/519
					123/519, 520

### [56] References Cited

### U.S. PATENT DOCUMENTS

4,308,840 4,790,283 4,817,576 4,894,072 4,915,643 4,919,103 5,056,494 5,111,795 5,143,041	12/1988 4/1989 1/1990 8/1990 4/1990 10/1991 5/1992	Hiramatsu et al. Uranishi et al. Abe et al. Turner et al. Sato et al. Ishiguro et al. Kayanuma Thompson Franzke	123/519 123/519 123/519 123/519 123/519 123/519 123/519
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5,209,210 5/1993 Ikeda et al. ...... 123/516

5,456,236

Oct. 10, 1995

5,209,210 5/1993 Ikeda et al. ...... 123/510

FOREIGN PATENT DOCUMENTS

Primary Examiner—Thomas N. Moulis Attorney, Agent, or Firm—Nikaido, Marmelstein, Murray &

#### [57] ABSTRACT

1-159455 6/1989 Japan.

An evaporative emission control system for an internal combustion engine includes a canister for adsorbing evaporative fuel generated in the fuel tank, a first introducing passage for introducing evaporative fuel generated in the fuel tank into the canister on an occasion other than at refueling, a purging passage for purging evaporative fuel adsorbed in the canister into the intake passage of the engine, and a first air-inlet passage communicating between the canister and the atmosphere. First and second adsorbent chambers are formed in the canister and each accommodating an adsorbent. The first introducing passage and the purging passage are connected to the first adsorbent chamber. The first air-inlet passage is connected to the second adsorbent chamber. A communication passage communicates between the first adsorbent chamber and the second adsorbent chamber. A second introducing passage is connected to the first and second adsorbent chambers, for introducing evaporative fuel generated in the fuel tank into the canister at refueling. A second air-inlet passage communicates between the first adsorbent chamber and the atmosphere. An electromagnetic valve is arranged across the second introducing passage, for opening the same at refueling.

#### 12 Claims, 9 Drawing Sheets

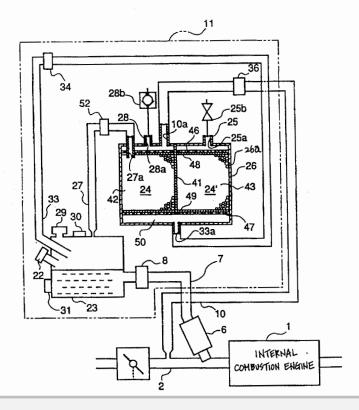
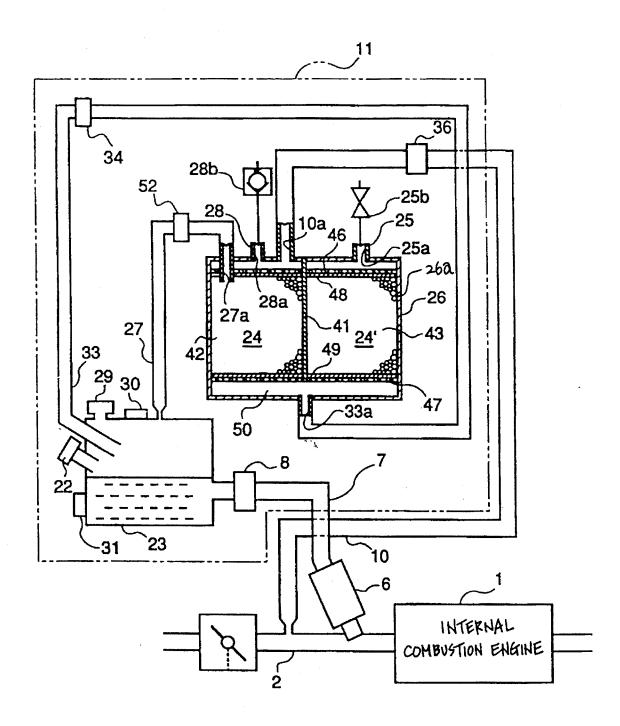




FIG. 1





# FIG. 2

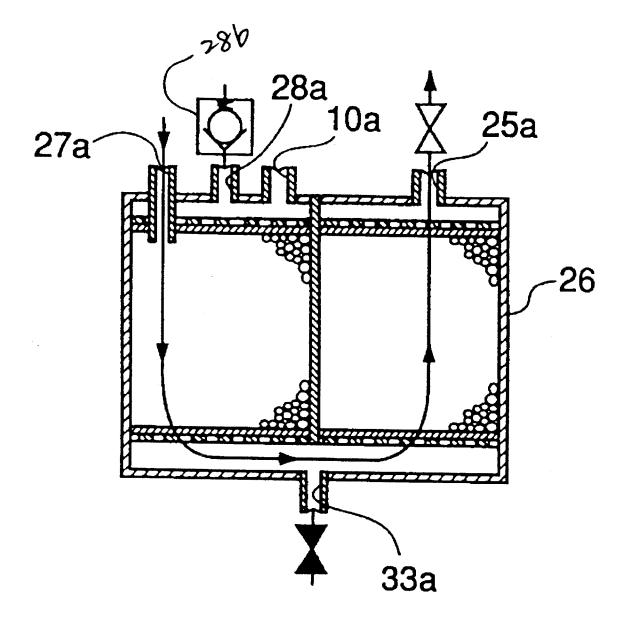




FIG. 3

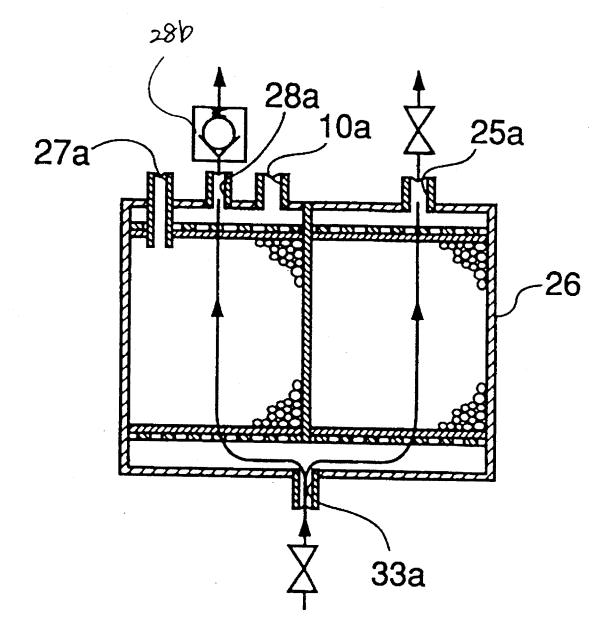
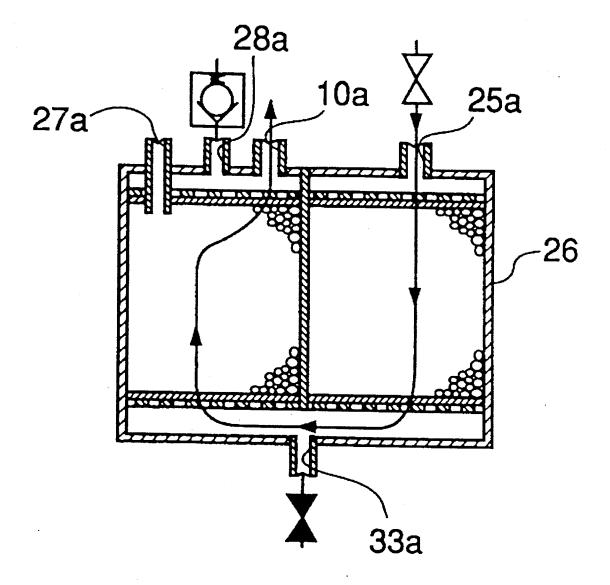




FIG. 4





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