



US005551384A

United States Patent [19]

[11] Patent Number: **5,551,384**

Hollis

[45] Date of Patent: **Sep. 3, 1996**

[54] **SYSTEM FOR HEATING TEMPERATURE CONTROL FLUID USING THE ENGINE EXHAUST MANIFOLD**

[76] Inventor: **Thomas J. Hollis**, 5 Roxbury Dr., Medford, N.J. 08055

[21] Appl. No.: **447,468**

[22] Filed: **May 23, 1995**

[51] Int. Cl.⁶ **F02N 17/02**

[52] U.S. Cl. **123/142.5 R; 123/196 AB; 165/52; 237/12.3 B**

[58] Field of Search **123/142.5 R, 196 AB, 123/41.05, 41.08, 41.22, 41.33; 165/52, 43; 237/12.3 B**

[56] **References Cited**

U.S. PATENT DOCUMENTS

1,168,623	1/1916	Furber .	
1,719,321	2/1929	De long .	
1,873,379	8/1932	Frentzel, Jr. .	
1,937,514	12/1933	Foutz .	
2,021,569	11/1935	Pasco .	
2,121,090	6/1938	Kuehn .	
2,180,663	11/1939	Bergeron et al. .	
2,354,345	7/1944	Wintergreen .	
2,400,977	5/1946	Clarkson .	
2,495,401	1/1950	Worthington .	
2,581,747	1/1952	Block .	
2,748,570	6/1956	Booth .	
3,134,374	5/1964	Stevens .	
3,357,413	12/1967	Quinton	123/41.05
3,397,684	8/1968	Scherenberg .	
3,450,109	6/1969	Gratzmuller .	
3,526,214	9/1970	Kamo .	
3,732,696	5/1973	Masaki .	
4,079,715	3/1978	Masaki et al. .	
4,095,575	6/1978	Wulf	123/142.5 R
4,249,491	2/1981	Stein .	
4,258,676	3/1981	Lamm	123/142.5 R
4,258,677	3/1981	Sanders .	
4,348,991	9/1982	Stang et al. .	

4,391,235	7/1983	Majkrzak	123/142.5 R
4,448,157	5/1984	Eckstein et al. .	
4,537,349	8/1985	Stolz	123/142.5 R
4,541,368	9/1985	Castarede .	
4,682,649	7/1987	Greer .	
4,685,430	8/1987	Ap	123/142.5 R
4,756,359	7/1988	Greer .	
4,805,403	2/1989	Bowman et al. .	
4,911,110	3/1990	Isoda et al. .	
4,991,546	2/1991	Yoshimura .	
5,121,714	6/1992	Susa et al.	123/41.29
5,170,755	12/1992	Kano et al. .	
5,215,044	6/1993	Banzhaf et al. .	
5,415,147	5/1995	Nagle et al. .	

FOREIGN PATENT DOCUMENTS

3435833	4/1986	Germany .	
3516502	11/1986	Germany .	
4033261	6/1992	Germany .	
3164516	7/1991	Japan	123/142.5 R

Primary Examiner—Erick R. Solis

Attorney, Agent, or Firm—Seidel, Gonda, Lavorgna & Monaco

[57] **ABSTRACT**

A temperature control system in an internal combustion engine includes a heating arrangement which channels a flow of temperature control fluid from an engine to and from an exhaust heating assembly which is located adjacent to an exhaust manifold in the engine. The exhaust heat assembly permits the transfer of heat from the exhaust gases flowing in the exhaust manifold to the temperature control fluid. The heated temperature control fluid is then directed back to the engine for efficient heating. In one embodiment, the temperature control fluid is directed through a heat exchanger in the engine oil pan so as to maintain the temperature of the engine lubricating oil at or near its optimum operating temperature. In a second embodiment, the temperature control fluid is directed from the exhaust heat assembly to the intake manifold so as to increase the temperature of the intake air prior to combustion.

17 Claims, 19 Drawing Sheets

