



United States Patent [19]

[11] **Patent Number:** 5,959,420

Boberg et al.

[45] **Date of Patent:** Sep. 28, 1999

[54] **HEAT ENGINE AND ELECTRIC MOTOR TORQUE DISTRIBUTION STRATEGY FOR A HYBRID ELECTRIC VEHICLE**

4,149,507	4/1979	Little, Jr. et al.	123/140
5,376,869	12/1994	Konrad	318/587
5,578,911	11/1996	Carter et al. .	
5,680,917	10/1997	Bray	477/180 X
5,695,430	12/1997	Moyer	477/189

[75] Inventors: **Evan S. Boberg; Brian P. Gebby**, both of Hazel Park, Mich.

[73] Assignee: **Chrysler Corporation**, Auburn Hills, Mich.

Primary Examiner—Karen Masih
Attorney, Agent, or Firm—Jennifer M. Stec

[21] Appl. No.: **08/982,047**

[57] **ABSTRACT**

[22] Filed: **Dec. 1, 1997**

A method is provided for controlling a power train system for a hybrid electric vehicle. The method includes a torque distribution strategy for controlling the engine and the electric motor. The engine and motor commands are determined based upon the accelerator position, the battery state of charge and the amount of engine and motor torque available. The amount of torque requested for the engine is restricted by a limited rate of rise in order to reduce the emissions from the engine. The limited engine torque is supplemented by motor torque in order to meet a torque request determined based upon the accelerator position.

[51] **Int. Cl.⁶** **H02P 7/00**

[52] **U.S. Cl.** **318/432; 318/587; 318/139; 318/254; 318/138; 318/439; 318/434; 180/282**

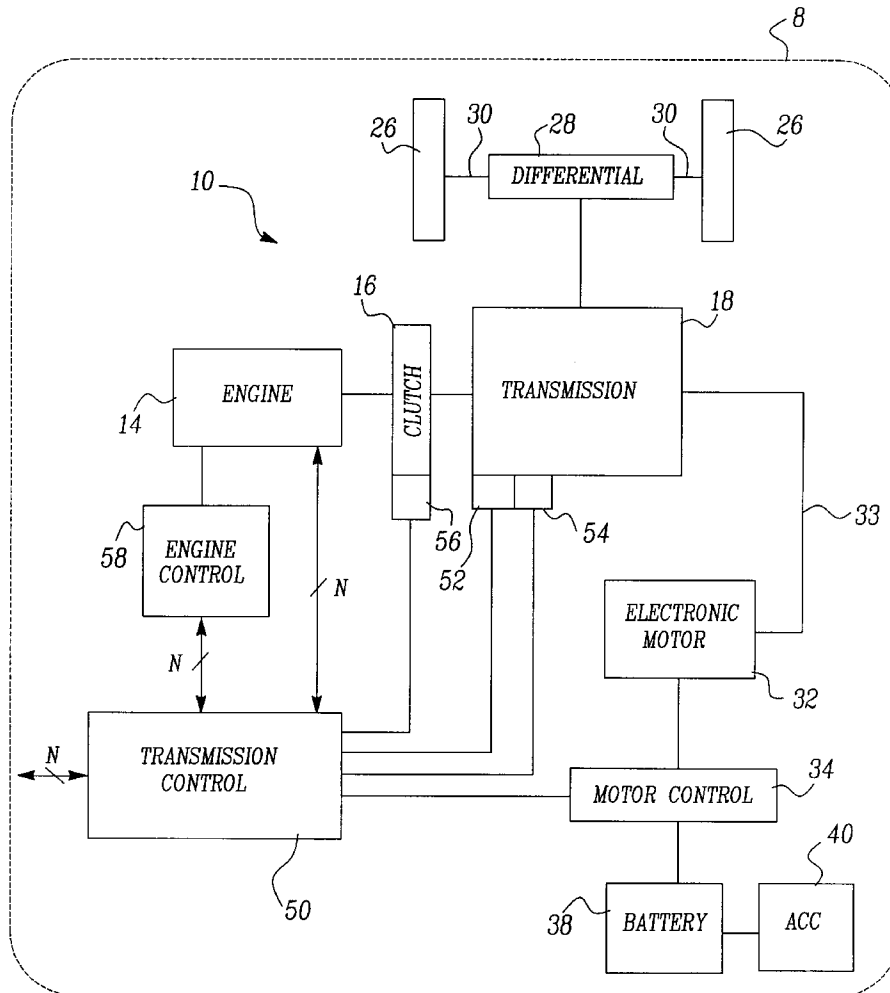
[58] **Field of Search** 318/587, 139, 318/254, 138, 439, 434; 180/282; 123/40; 477/189, 180

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,916,862 11/1975 Clouse et al. 123/140 X

8 Claims, 7 Drawing Sheets



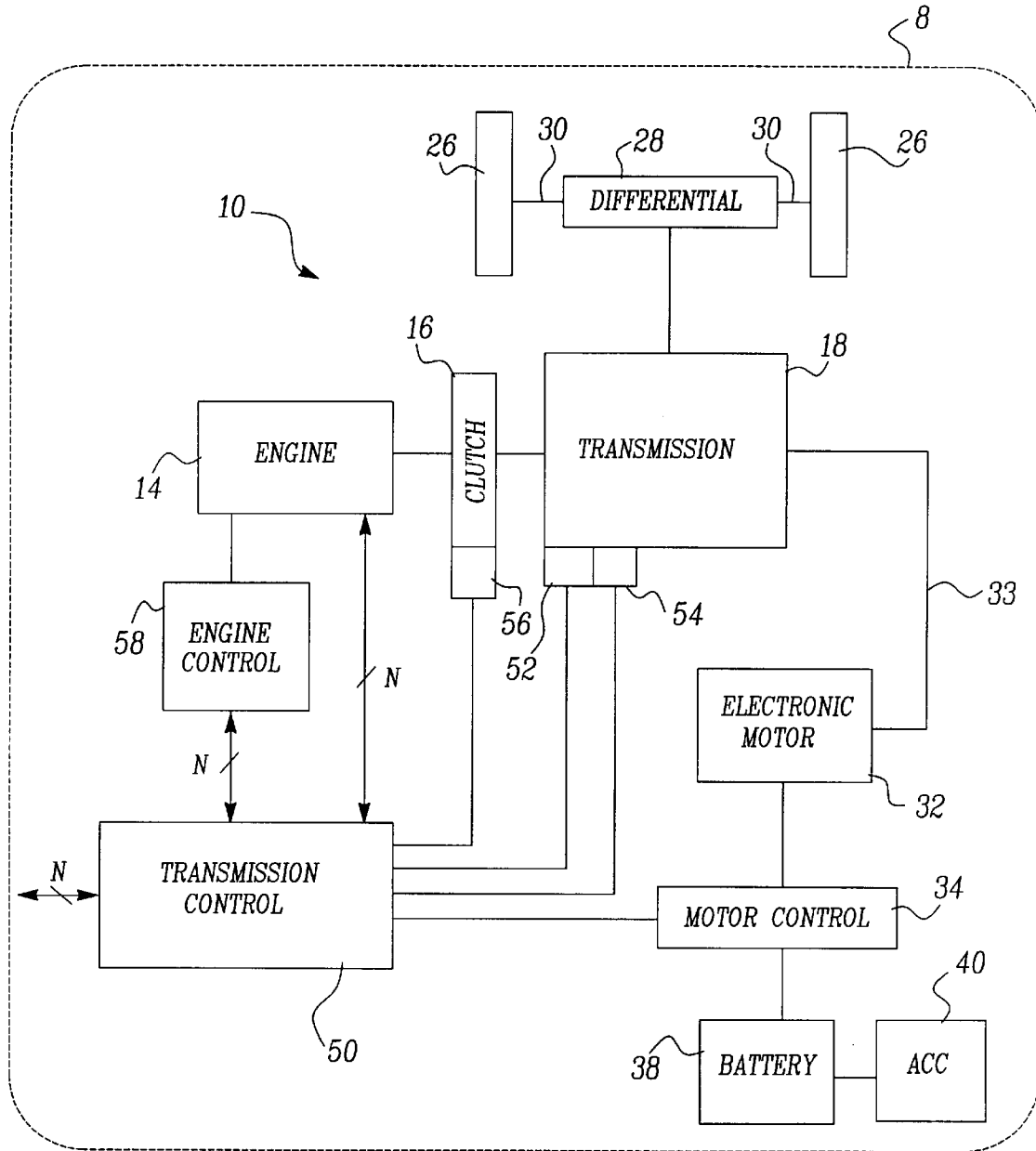


Fig-1

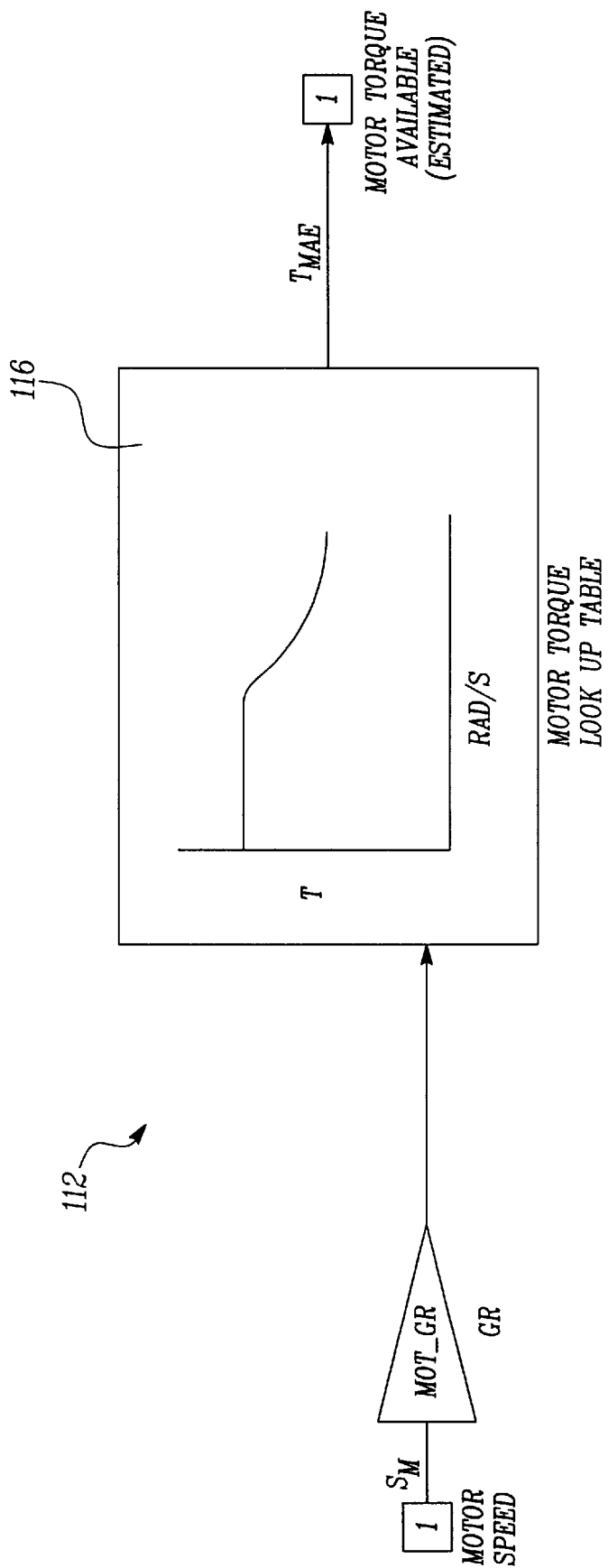


Fig-3

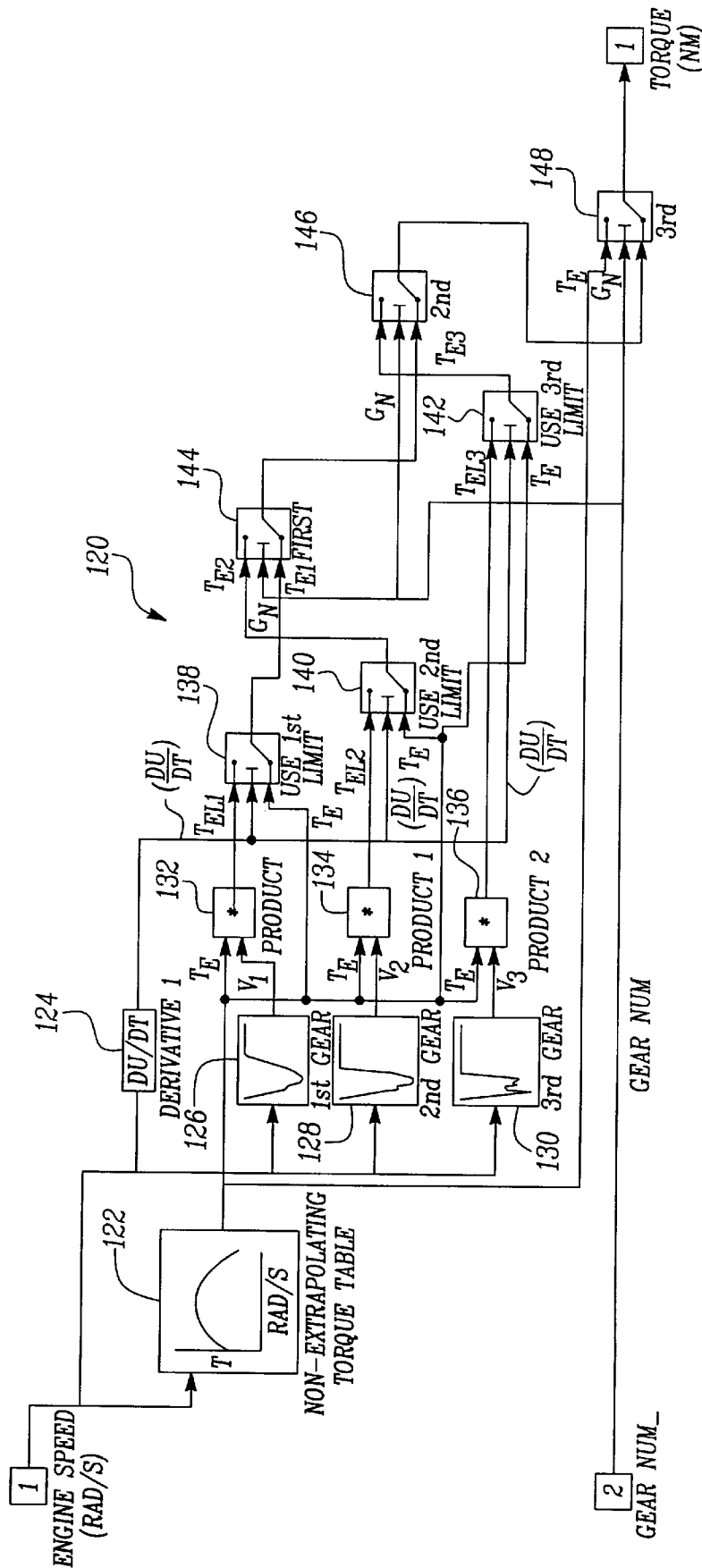


Fig-4

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.