

(12) **United States Patent**
Williams, Jr. et al.

(10) **Patent No.:** **US 6,323,565 B1**
(45) **Date of Patent:** ***Nov. 27, 2001**

(54) **METHOD AND APPARATUS FOR OPERATING A POWER LIFTGATE IN AN AUTOMOBILE**

(75) Inventors: **Robert M. Williams, Jr.**, Grand Blanc; **Patrick D. Dean**, Armada; **Richard L. Long**, Clarkston; **Ernest P. Minissale**, Novi, all of MI (US)

(73) Assignee: **DaimlerChrysler Corporation**, Auburn Hills, MI (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **09/413,843**

(22) Filed: **Oct. 6, 1999**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/166,029, filed on Oct. 5, 1998, now Pat. No. 6,091,162, and a continuation-in-part of application No. 09/163,147, filed on Sep. 29, 1998, now Pat. No. 6,075,460.

(51) **Int. Cl.⁷** **B60L 1/00**

(52) **U.S. Cl.** **307/10.1; 340/825.69; 709/245**

(58) **Field of Search** **307/10.1; 340/426, 340/825.69; 701/49**

(56) **References Cited**

U.S. PATENT DOCUMENTS

D. 334,735	4/1993	Cameron et al. .
D. 398,588	9/1998	Pinardi et al. .
4,634,945	1/1987	Takekura et al. .
5,155,937	10/1992	Yamagishi et al. .
5,343,475	8/1994	Matsuda et al. .
5,563,483	10/1996	Kowall et al. .
5,627,529	5/1997	Duckworth et al. .
5,701,418	12/1997	Luitje .
6,075,460 *	6/2000	Minissale et al. 340/825.69
6,091,162 *	7/2000	Williams, Jr. et al. 307/10.1

* cited by examiner

Primary Examiner—Josie Ballato

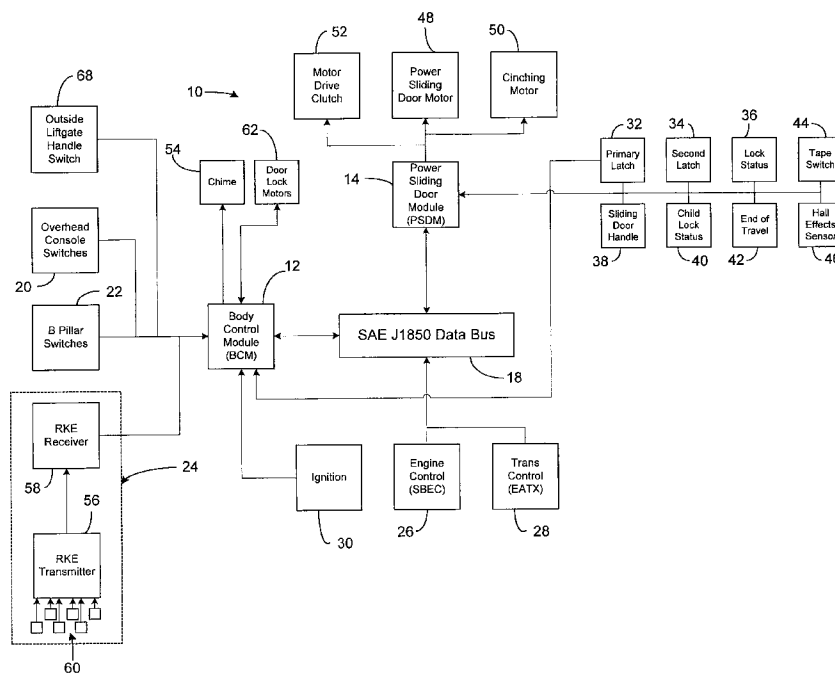
Assistant Examiner—Sharon Polk

(74) *Attorney, Agent, or Firm*—Mark P. Calcaterra

(57) **ABSTRACT**

A method and apparatus for operating a power liftgate in an automobile, such as a minivan, is disclosed. The invention is comprised in a control system that includes a user input interface for receiving power liftgate actuation requests from a user. The actuation signals are carried to a body control module (BCM) where the request is broadcast to a power liftgate module (PLGM) over a serial data bus communications network meeting the SAE J1850 multiplex communications protocol standard. Upon receipt of the actuation message, the PLGM monitors several operating conditions of the automobile and makes a determination whether or not to carry out the power liftgate activation request. Power liftgate actuation is controlled by the PLGM via electric motors located at or near the liftgate. The user input interface includes interior switches as well as a RKE system.

18 Claims, 7 Drawing Sheets



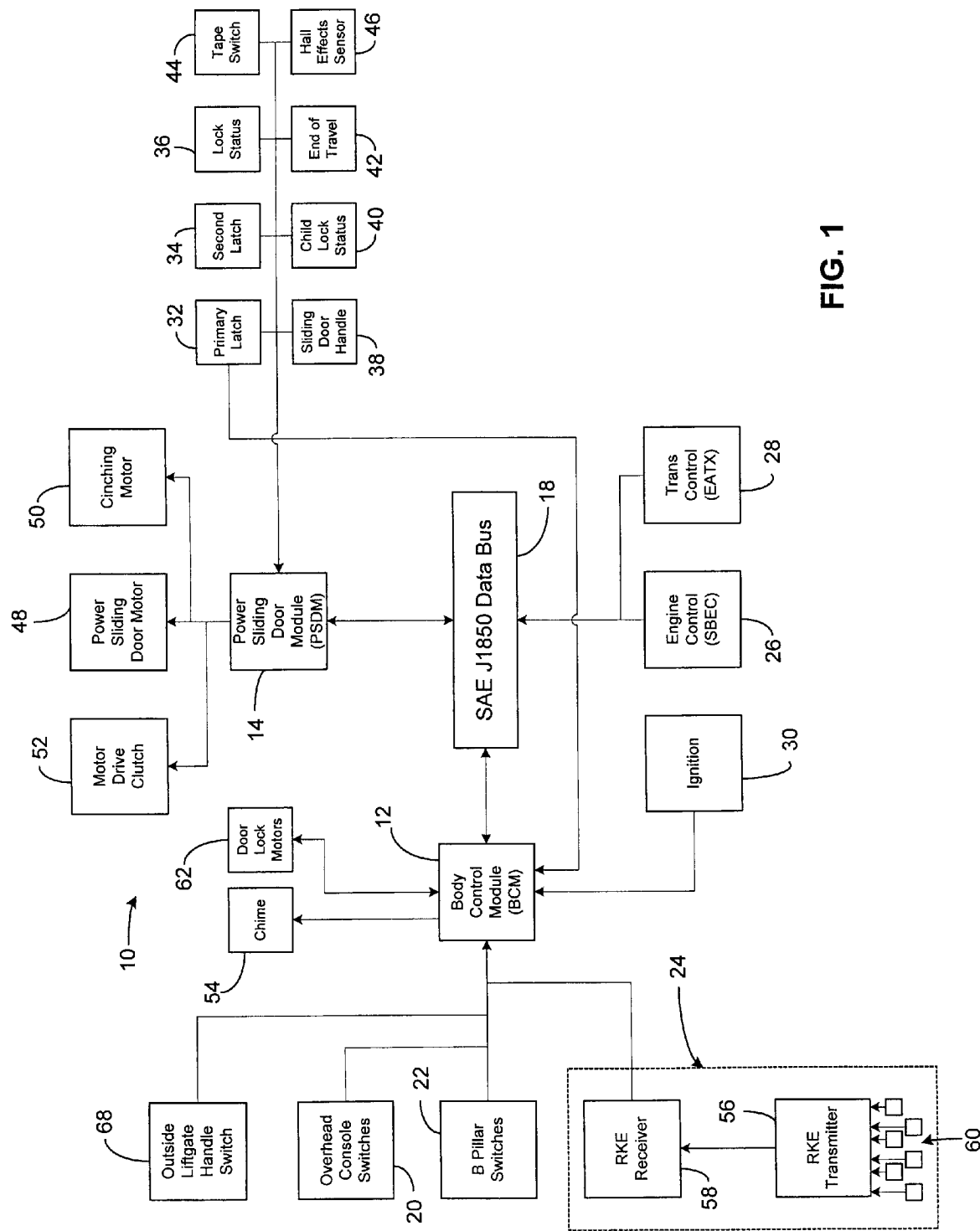


FIG. 1

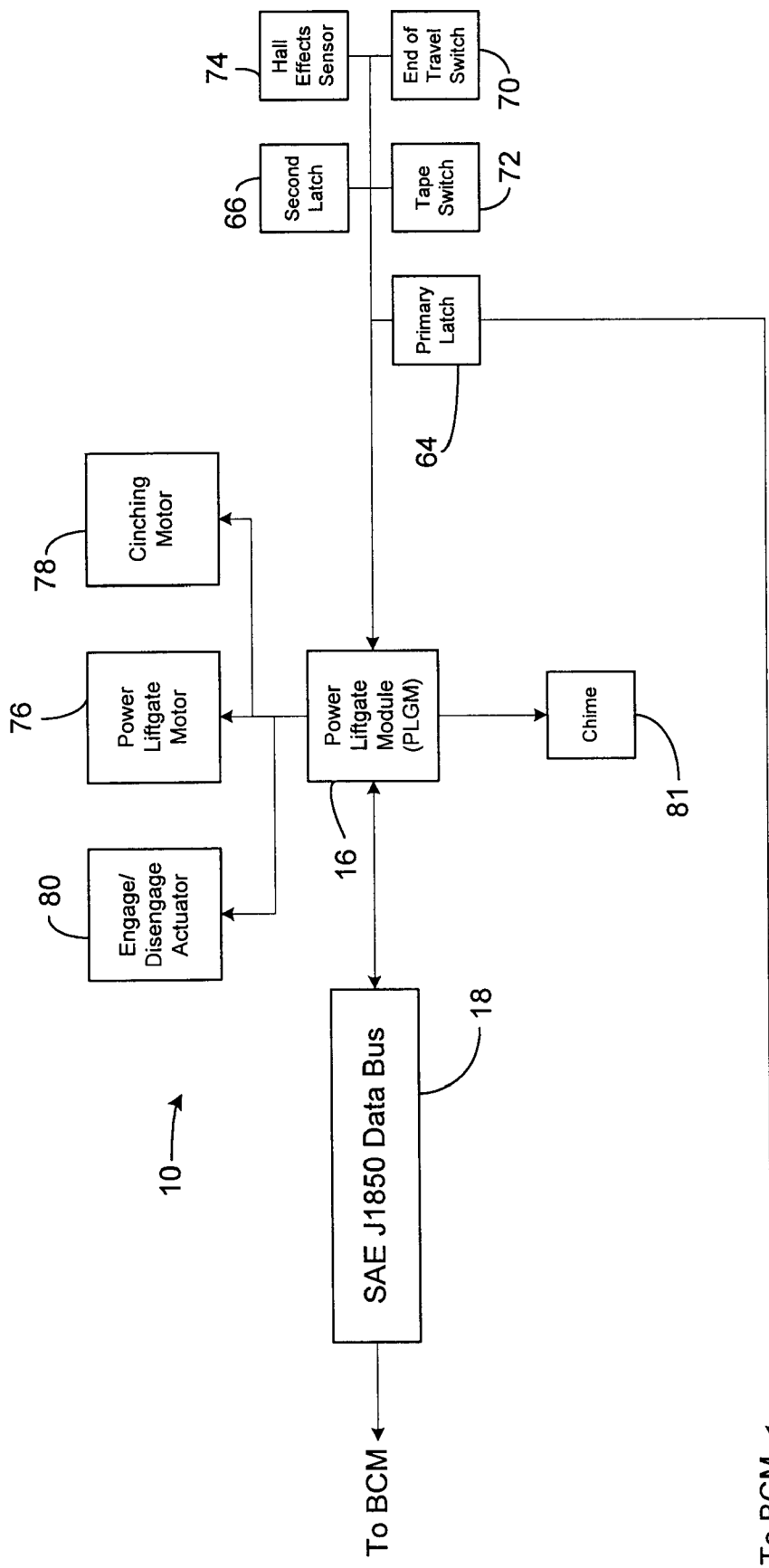


FIG. 2

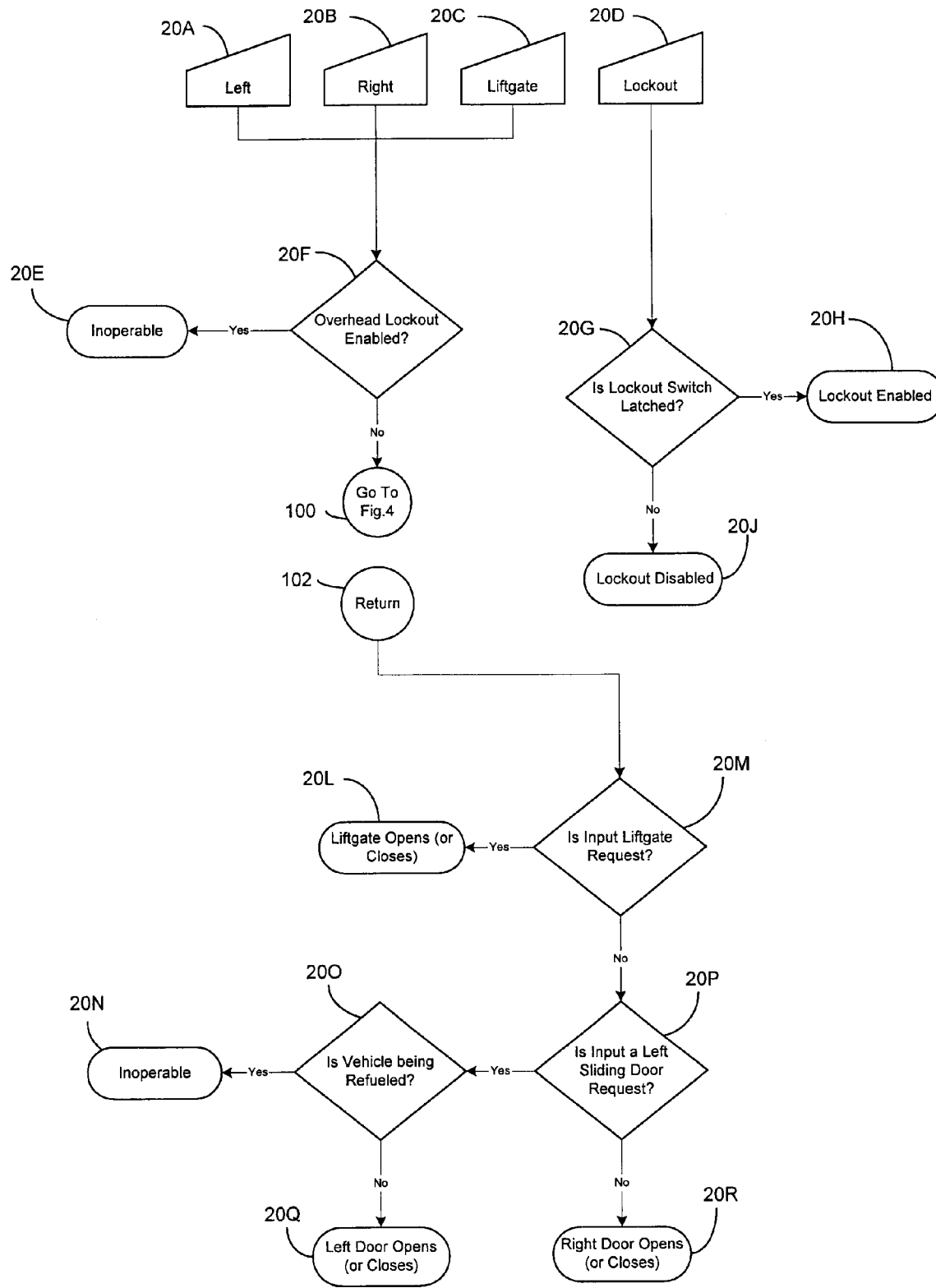


FIG. 3A

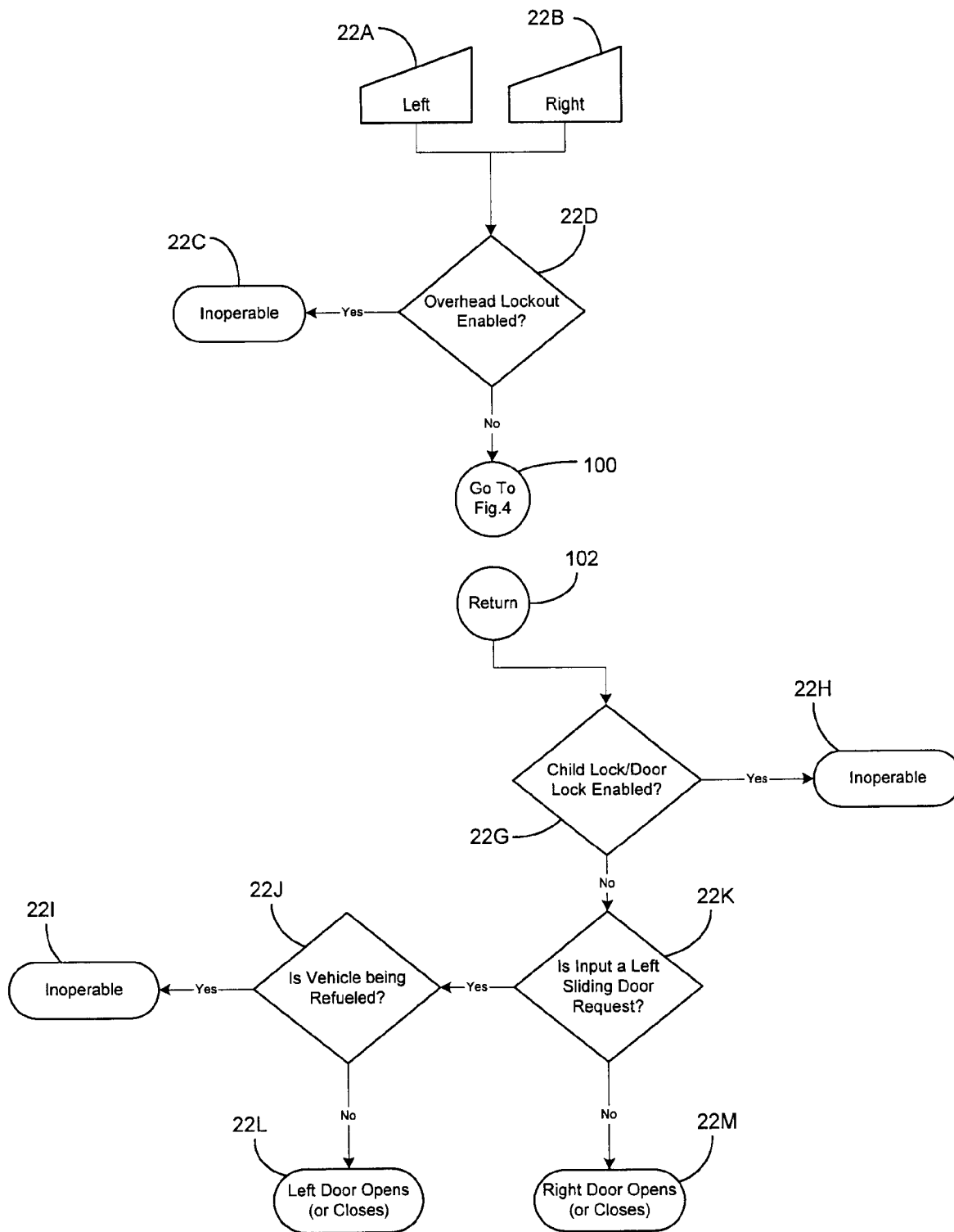


FIG. 3B

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.