



US006921870B2

(12) **United States Patent**  
**Lan et al.**

(10) **Patent No.:** **US 6,921,870 B2**  
(45) **Date of Patent:** **Jul. 26, 2005**

(54) **SHIFTING MECHANISM FOR ELECTRIC VEHICLES**

(75) Inventors: **Yih-Yuan Lan**, Chia-I Hsien (TW);  
**Ming-Chia Wu**, Chia-I Hsien (TW)

(73) Assignee: **Link Treasure Limited**, Chia-I Hsien (TW)

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

(21) Appl. No.: **10/673,387**

(22) Filed: **Sep. 30, 2003**

(65) **Prior Publication Data**

US 2004/0069557 A1 Apr. 15, 2004

(30) **Foreign Application Priority Data**

Oct. 9, 2002 (TW) ..... 91216134 U

(51) **Int. Cl.<sup>7</sup>** ..... **H01H 3/00**

(52) **U.S. Cl.** ..... **200/6 R; 200/6 B; 200/18**

(58) **Field of Search** ..... **200/6 R, 6 B, 200/17 R, 18, 61.85, 88, 1 R, 5 B**

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,639,705 A \* 2/1972 Rayner ..... 200/6 A

4,401,866 A \* 8/1983 Kaminski et al. .... 200/61.88  
4,531,027 A \* 7/1985 Vogt et al. .... 200/6 A  
5,173,591 A \* 12/1992 Perego ..... 200/61.88  
5,197,344 A \* 3/1993 Maier et al. .... 200/61.88  
5,644,114 A 7/1997 Neaves  
5,742,014 A \* 4/1998 Schwartz et al. .... 200/61.27

\* cited by examiner

*Primary Examiner*—Lincoln Donovan

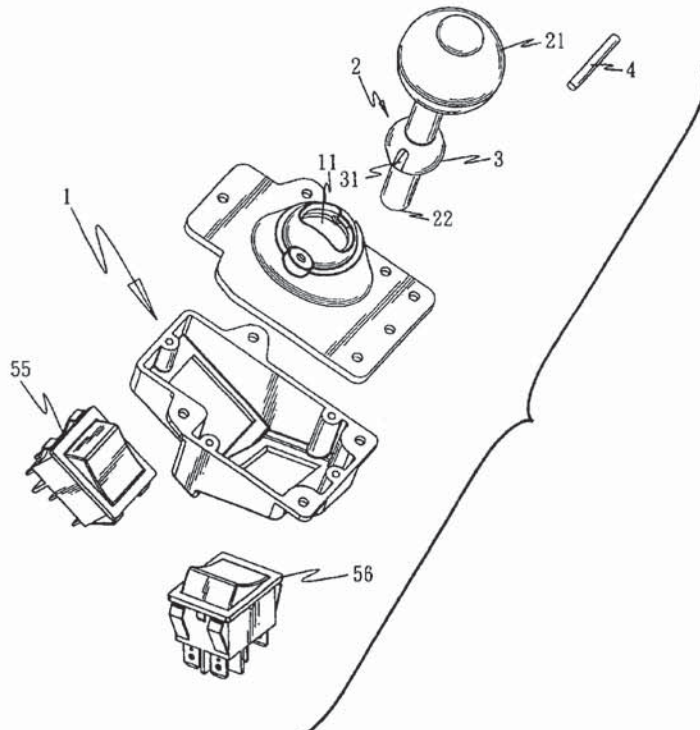
*Assistant Examiner*—M. Fishman

(74) *Attorney, Agent, or Firm*—Rabin & Berdo, P.C.

(57) **ABSTRACT**

A shifting mechanism for electric vehicles includes an operation bar coupled with a universal joint mounting on an electric vehicle body. The operation bar may be turned and swiveled in multiple directions and has a free end movable according to preset paths of a guiding means. The operation bar may be swiveled in different directions or through the guiding means to switch circuits that control motor positive rotation and reverse rotation at high speed or low speed. Thereby a definite direction is provided to switch the direction and speed. The switches are located on different positions and arranged in low—high speed and forward (positive rotation)—backward (reverse rotation) fashion so that the backward movement can only be exercised at the low speed to avoid the risk of backward high speed condition to secure safety for children's ride-on electric vehicles.

**20 Claims, 12 Drawing Sheets**



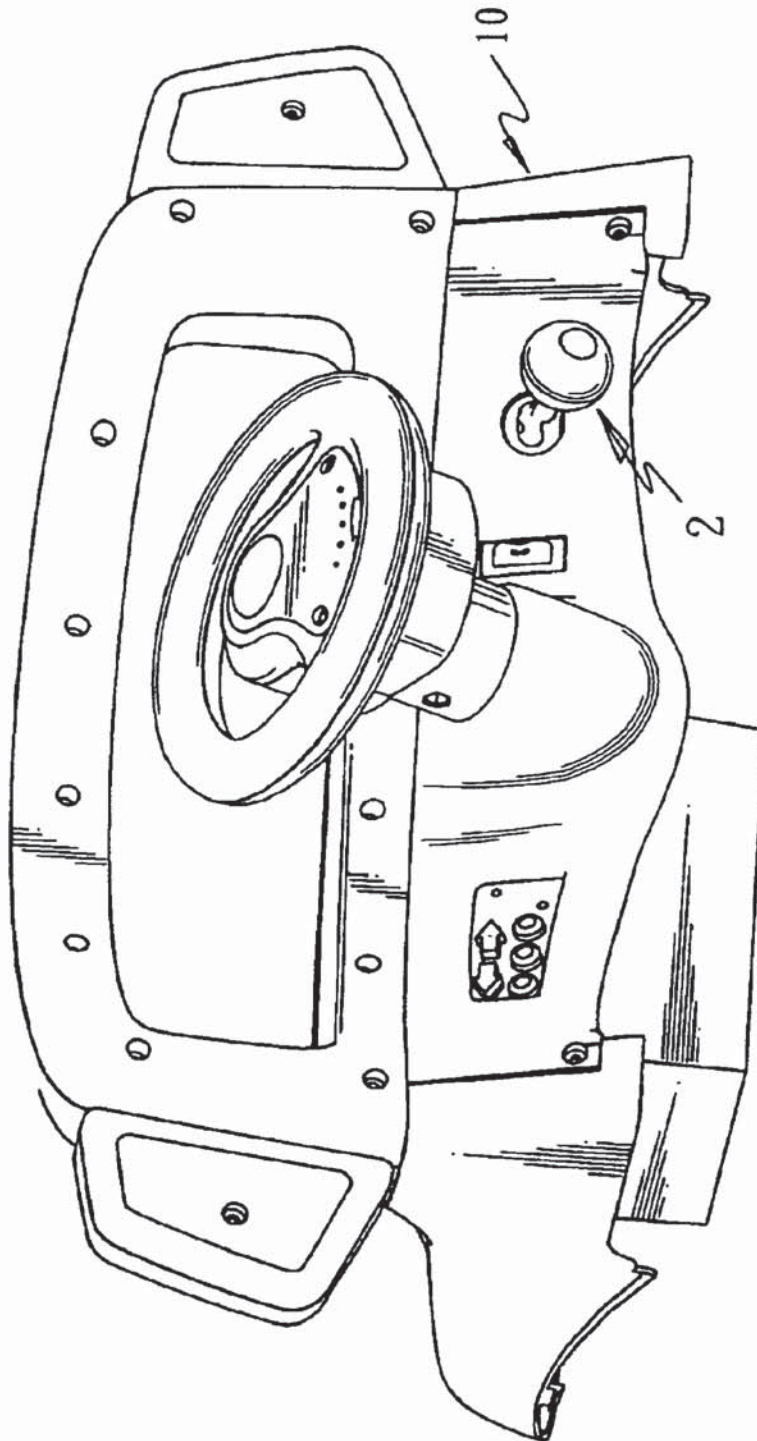


FIG.1

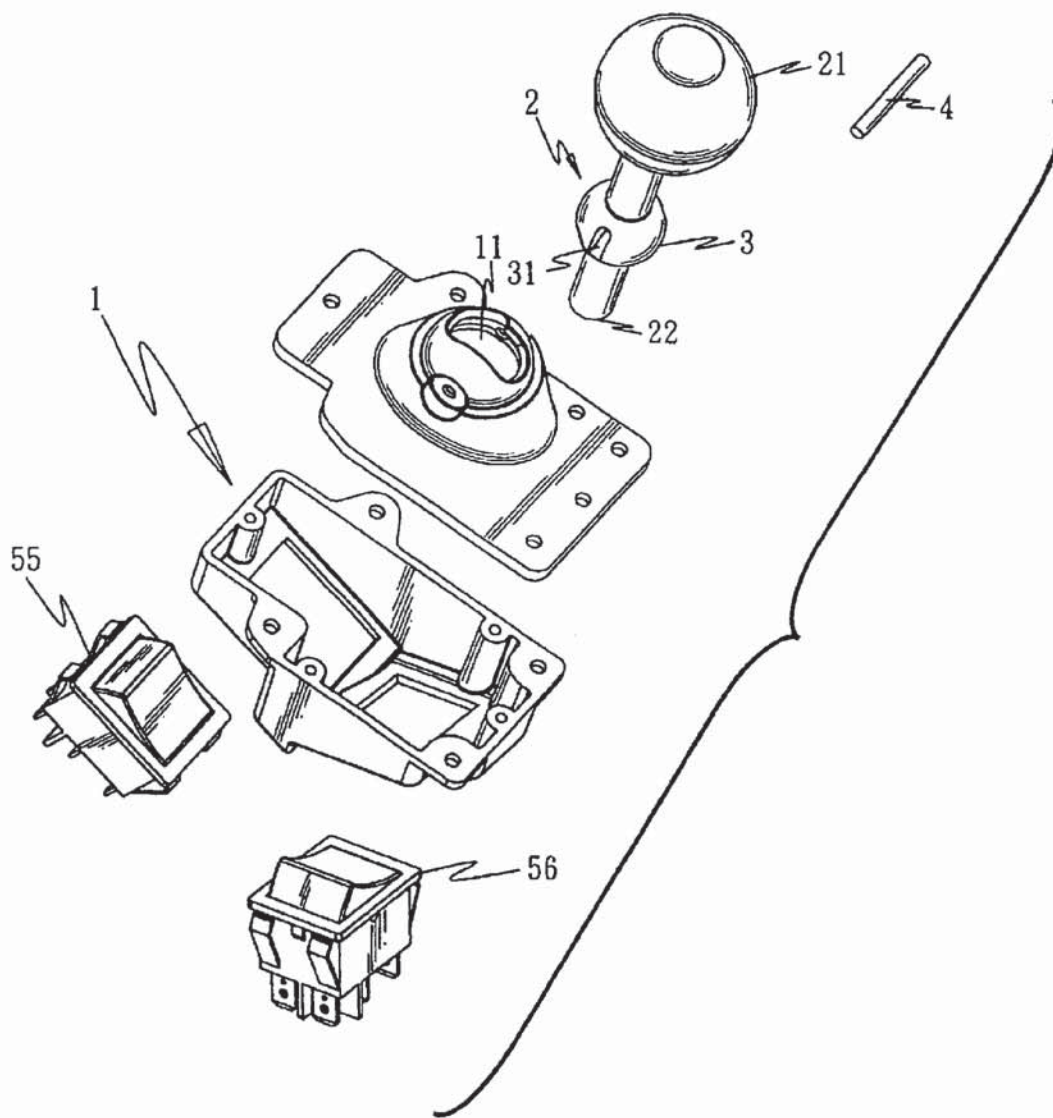


FIG.2

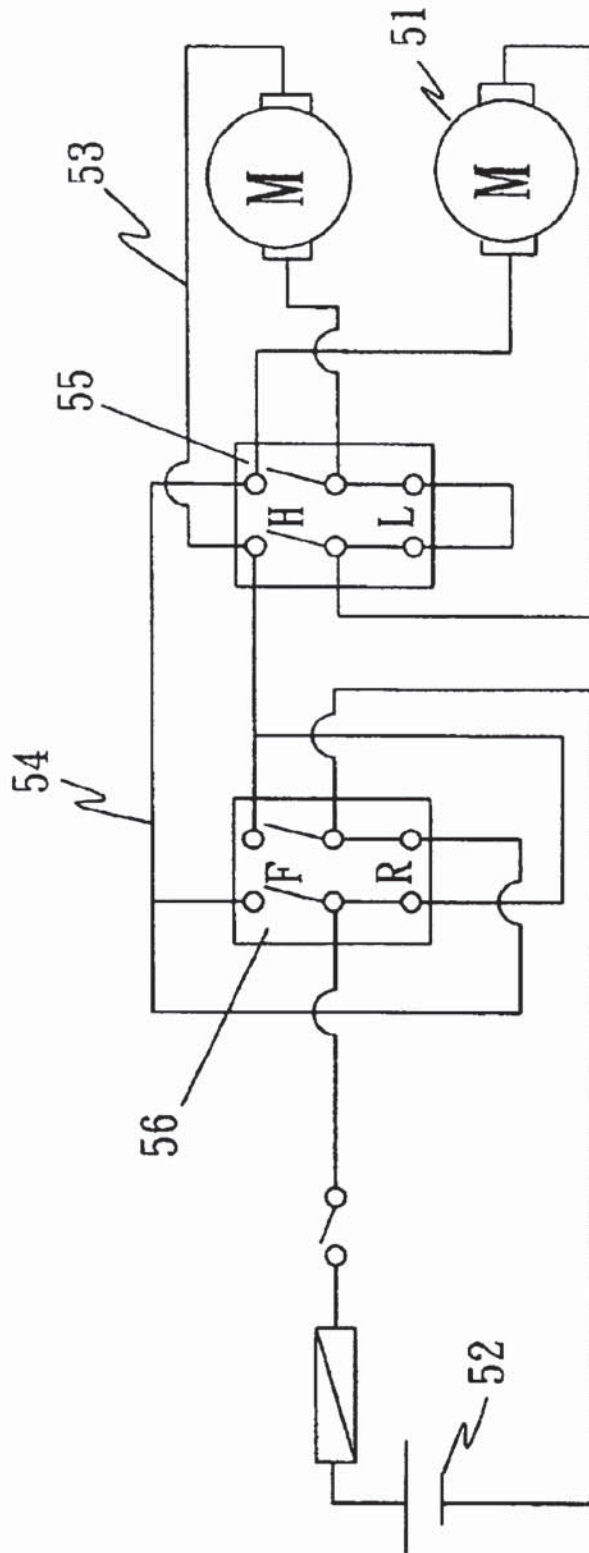


FIG.3

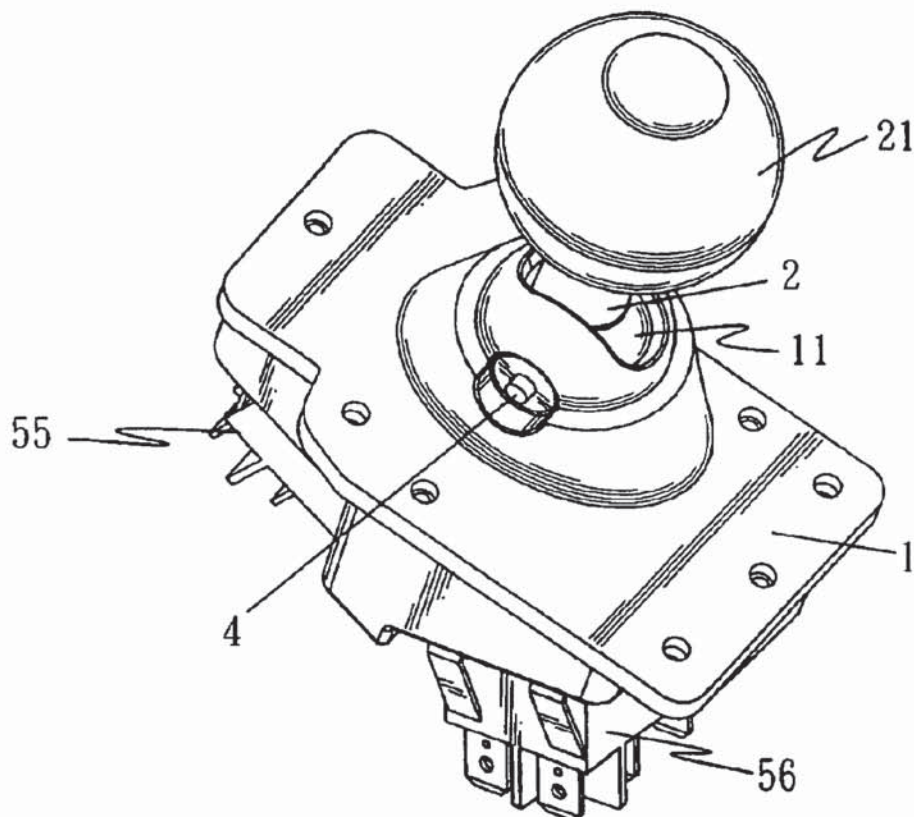


FIG.4

# 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.