



[54] FAIL SAFE METHOD AND APPARATUS FOR A USB DEVICE

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[52] U.S. Cl. 710/100; 710/131; 714/1; 714/3

[58] Field of Search 395/280, 180, 395/181, 182.01, 182.03, 828, 830; 710/100, 8, 10, 131; 714/1, 2, 3, 5

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Primary Examiner—Ayaz R. Sheikh

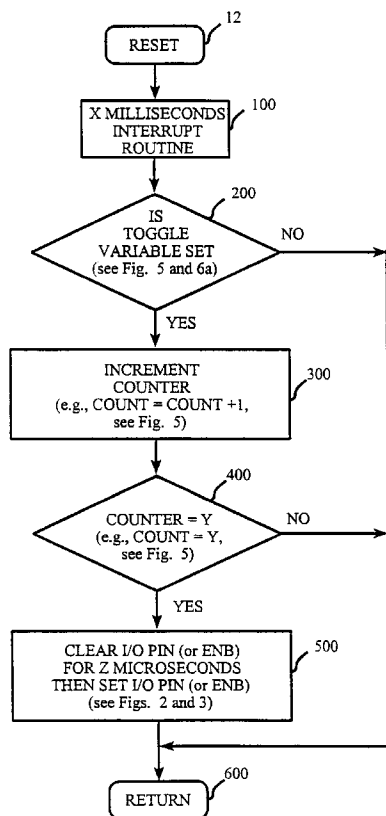
Assistant Examiner—Ario Etienne

Attorney, Agent, or Firm—Christopher P. Maiorana, P.C.

[57] ABSTRACT

A method and apparatus for determining and recovering from a USB micro-controller busy condition, wherein a toggle variable indicative of whether the USB micro-controller is in the busy condition or not is stored in a memory, and a counter is incremented if the toggle variable is set. The counter is checked to determine if the counter has reached a predetermined count, and if so data lines of the USB micro-controller are disconnected from a USB bus coupled to the USB micro-controller for a predetermined amount of time to cause a USB host computer coupled to the USB micro-controller to re-initialize the USB micro-controller. The memory contains a data structure including fields for storing the toggle variable, and a count indicative of how many times the toggle variable has been set for implementing the counter. Firmware in the memory includes code segments configured to store the toggle variable in the data structure, determine if the toggle variable is set, increment the count field if the toggle variable is set, determine if the counter has reached the predetermined count, and disconnect the data lines of the processor from the USB bus for a predetermined amount of time if the counter has reached the predetermined count.

20 Claims, 7 Drawing Sheets



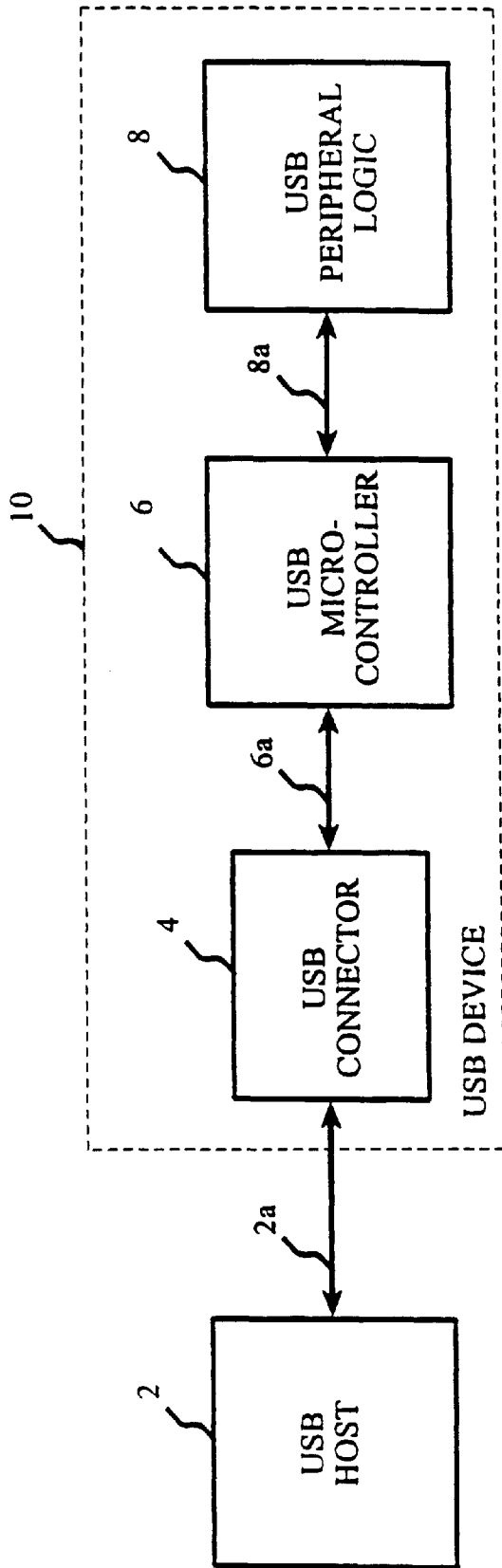


Fig. 1

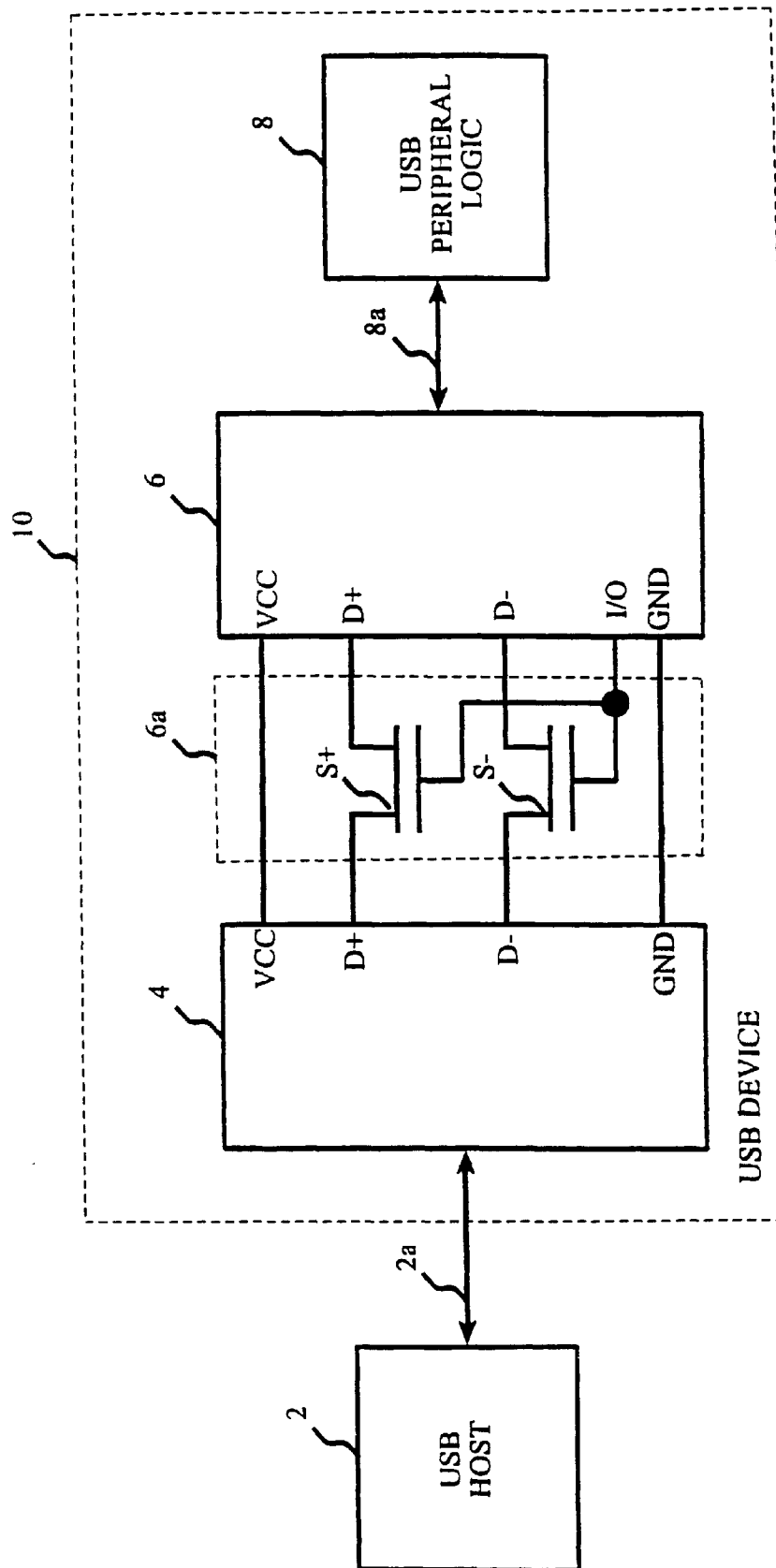


Fig. 2

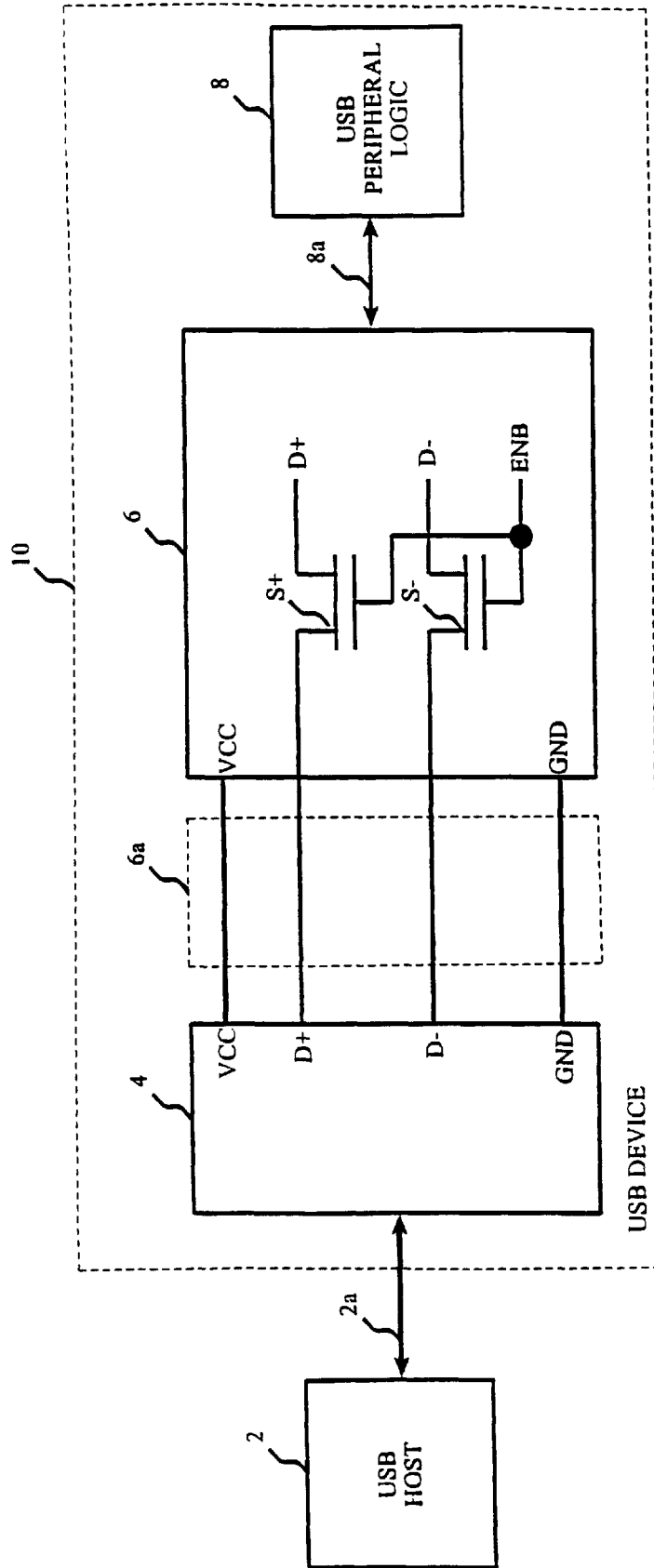


Fig. 3

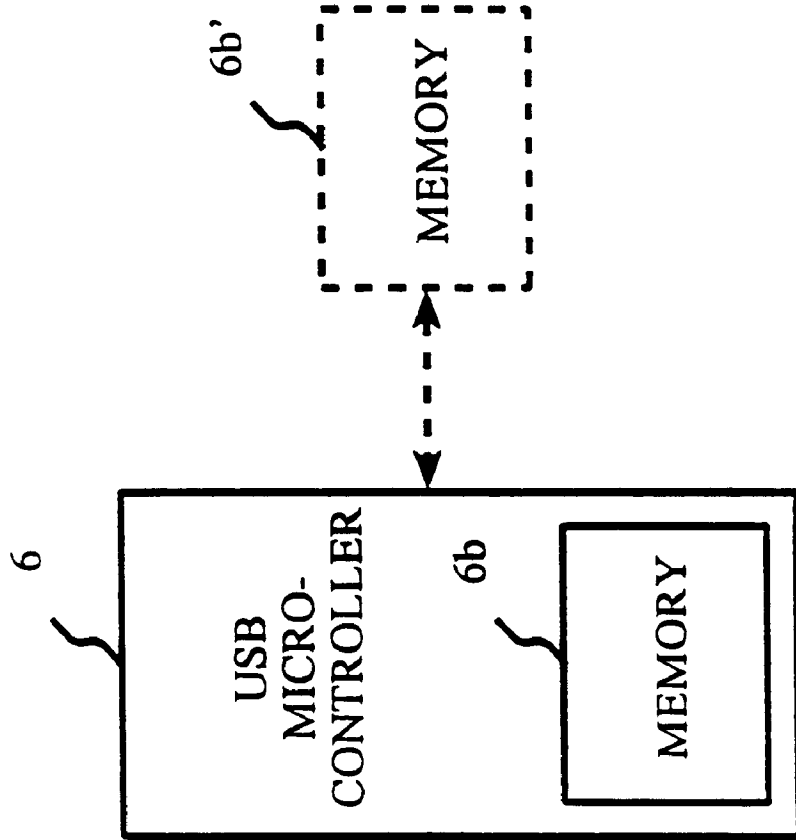


Fig. 4

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