US006204708B1

(12) **United States Patent**
Alexander

(10) **Patent No.: US 6,204,708 B1**
(45) **Date of Patent: Mar. 20, 2001**

(54) **APPARATUS AND METHOD FOR AN IMPROVED MASTER-SLAVE FLIP-FLOP WITH NON-OVERLAPPING CLOCKS**

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(*) 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.: **09/182,088**

(22) Filed: **Oct. 29, 1998**

(51) **Int. Cl.**[7] **H03K 3/289**
(52) **U.S. Cl.** **327/203**; 327/212
(58) **Field of Search** 327/202, 203, 327/210, 211, 212, 291, 295, 299, 239, 256, 257, 259, 269, 270, 271, 272, 276–278, 281, 284, 288

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(57) **ABSTRACT**

An improved master-slave flip-flop that is characterized by a novel clock generator. The improved flip-flop preserves the true master-slave relationship by ensuring a two step latching process is executed by non-overlapping clocks. The clock generator features an inverter in combination with a current limiter. The current limiter has the effect of shifting the trip point of the inverter such that non-overlapping clocks may be derived from a single master clock signal or a master clock signal and its complement.

18 Claims, 9 Drawing Sheets

