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(12) **United States Patent**  
**Lee**

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(54) **DIGITAL VIDEO INTERFACE WITH BI-DIRECTIONAL HALF-DUPLEX CLOCK CHANNEL USED AS AUXILIARY DATA CHANNEL**

2002/0181608 A1\* 12/2002 Kim et al. .... 375/295  
2004/0001447 A1\* 1/2004 Schafer ..... 370/280  
2004/0264482 A1\* 12/2004 Kang et al. .... 370/401  
2008/0112371 A1\* 5/2008 Joshi et al. .... 370/337

**OTHER PUBLICATIONS**

"Digital Visual Interface, DVI: Revision 1.0," Apr. 2, 1999, Digital Display Working Group, pp. 1-76.  
"High-Definition Multimedia Interface: Specification Version 1.2a," Dec. 14, 2005, pp. 1-193, HDMI Licensing, LLC.  
"High-Definition Multimedia Interface: Specification Version 1.3a," Nov. 10, 2006, pp. 1-276, HDMI Licensing, LLC.  
"Unified Display Interface (UDI) Specification: Revision 1.0a Final," Jul. 12, 2006, pp. 1-185.

\* cited by examiner

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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 405 days.

(21) Appl. No.: **11/760,164**

(22) Filed: **Jun. 8, 2007**

(65) **Prior Publication Data**

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**Related U.S. Application Data**

(60) Provisional application No. 60/910,759, filed on Apr. 9, 2007.

(51) **Int. Cl.**  
**H04J 3/12** (2006.01)

(52) **U.S. Cl.** ..... **370/525**

(58) **Field of Classification Search** ..... None  
See application file for complete search history.

(56) **References Cited**

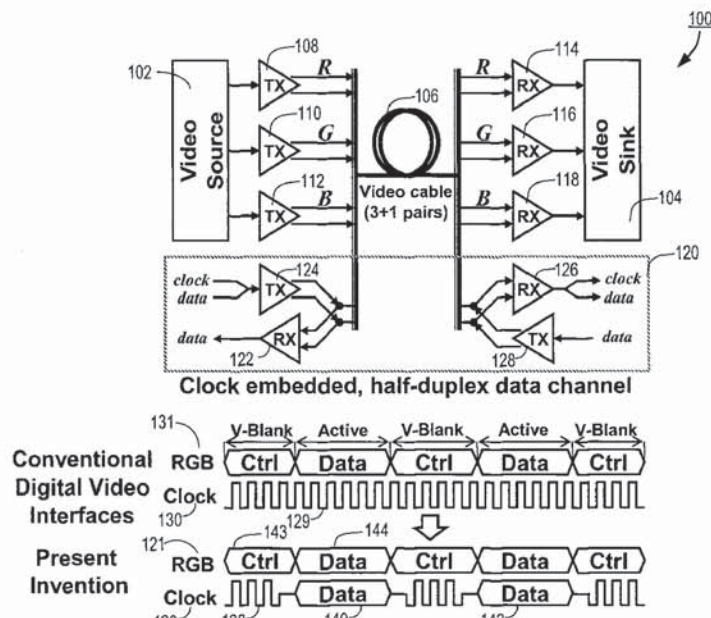
**U.S. PATENT DOCUMENTS**

6,507,592 B1\* 1/2003 Hurvig et al. .... 370/503  
7,295,578 B1\* 11/2007 Lyle et al. .... 370/503  
2001/0024430 A1\* 9/2001 Sekine et al. .... 370/331

(57) **ABSTRACT**

A digital video interface system and method for communicating digital video data from a source device to a sink device is provided, where the clock channel is used to transmit data as well as clock signals in a bi-directional, half-duplex manner using time division multiplexing. The digital video interface system comprises one or more data channels configured to transmit digital video data from the source device to the sink device in time divisional multiplexing including a plurality of first time slots and second time slots, and a clock channel configured to transmit a clock signal from the source device to the sink device in the first time slots and configured to transmit additional data from the source device to the sink device or from the sink device to the source device in the second time slots.

**32 Claims, 4 Drawing Sheets**



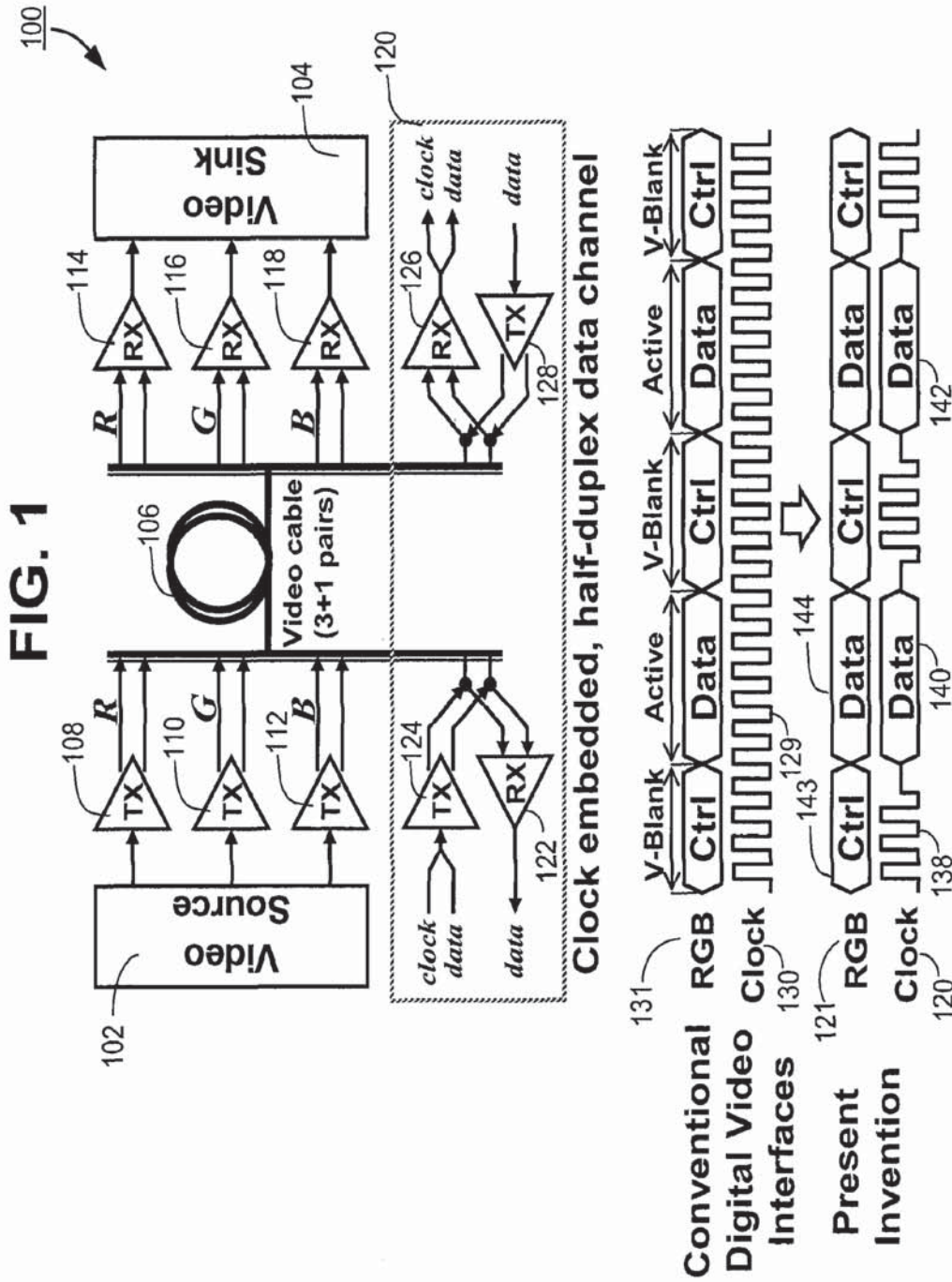


FIG. 2

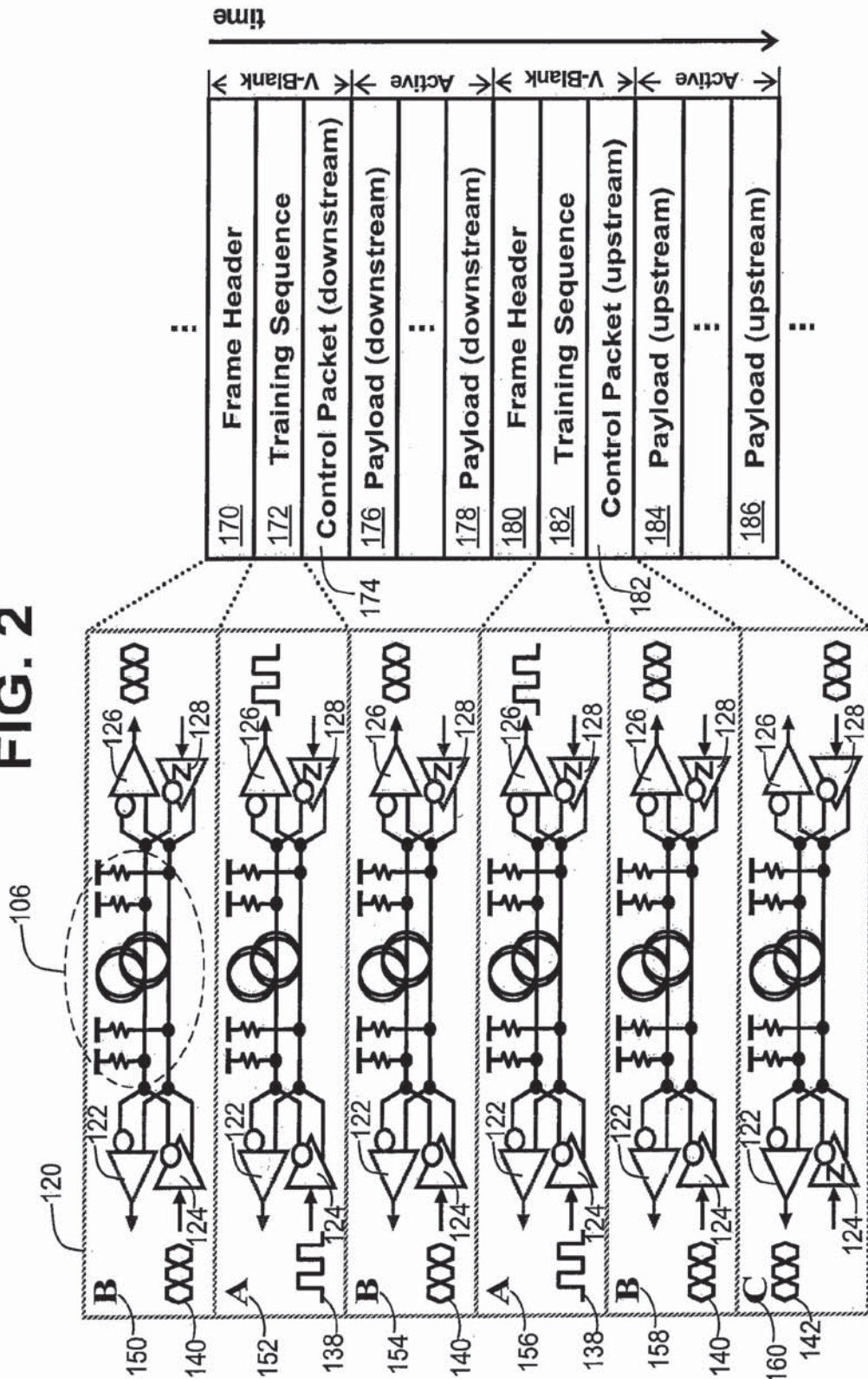
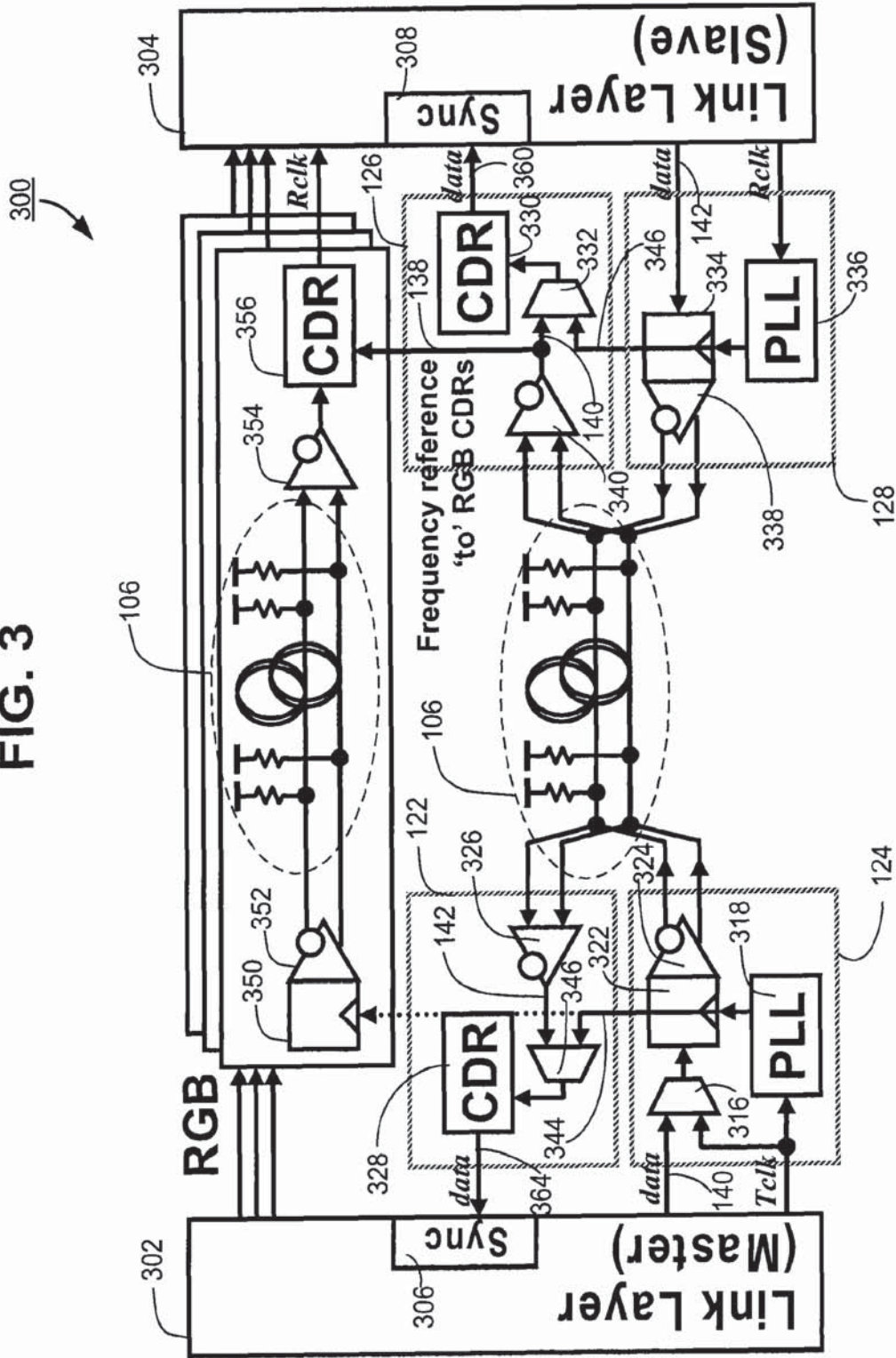
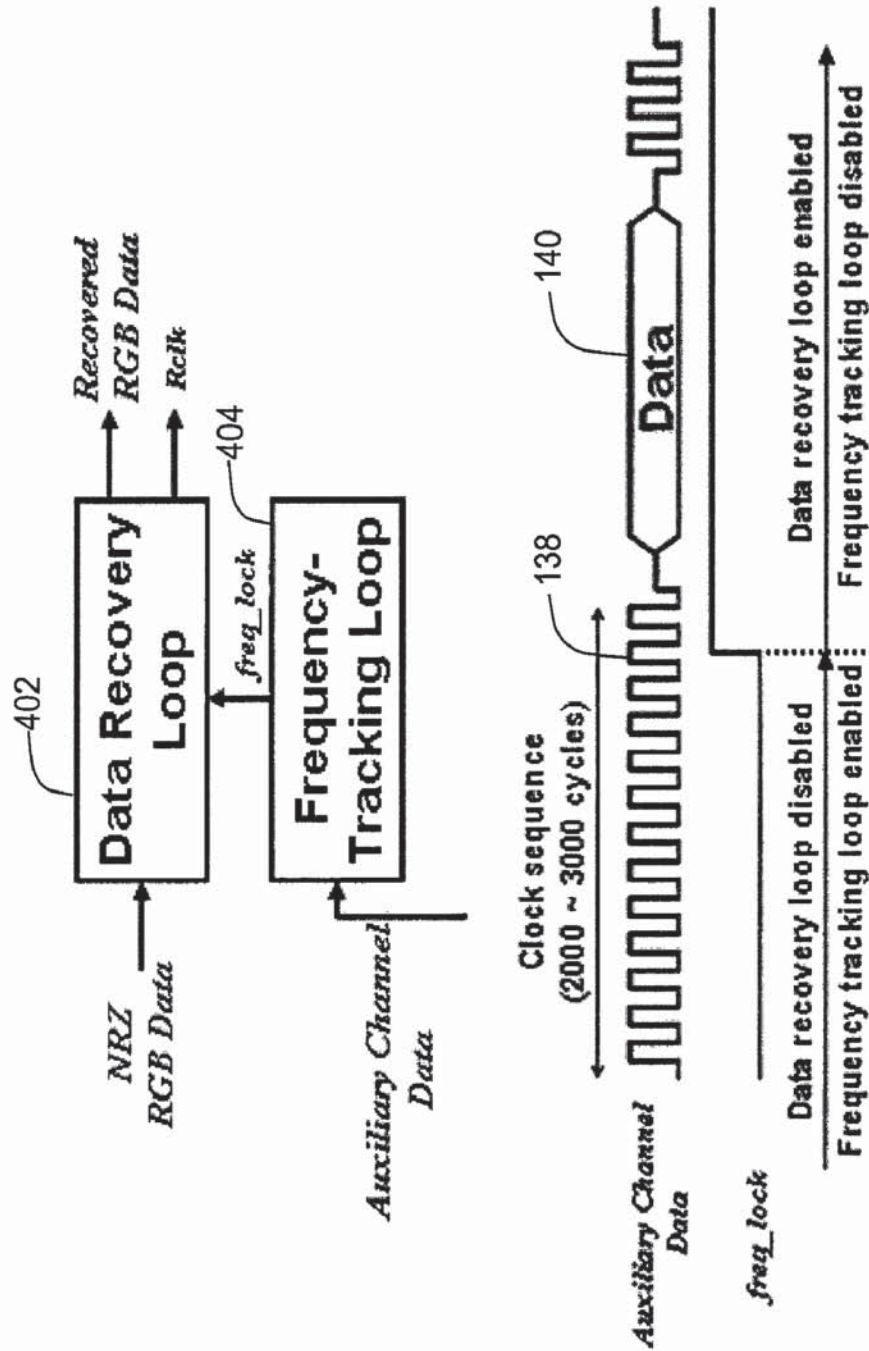


FIG. 3



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FIG. 4



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