



US009008190B2

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

(10) **Patent No.:** **US 9,008,190 B2**  
(45) **Date of Patent:** **Apr. 14, 2015**

(54) **APPARATUS FOR PROCESSING IMAGES AND METHOD THEREOF**

(75) Inventors: **Kun-Sik Lee**, Pyeongtaek-si (KR);  
**Yoon-Jung Kim**, Pyeongtaek-si (KR);  
**Hae-Jin Bae**, Pyeongtaek-si (KR);  
**Gyu-Seung Kim**, Pyeongtaek-si (KR);  
**Sang-Chul Kim**, Pyeongtaek-si (KR);  
**Sang-Kil Park**, Pyeongtaek-si (KR);  
**Jaе-Kyung Lee**, Pyeongtaek-si (KR);  
**Jin-Gyeong Kim**, Pyeongtaek-si (JP);  
**Tae-II Chung**, Pyeongtaek-si (KR)

(73) Assignee: **LG Electronics, Inc.**, Seoul (KR)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 557 days.

(21) Appl. No.: **12/651,730**

(22) Filed: **Jan. 4, 2010**

(65) **Prior Publication Data**  
US 2010/0194998 A1 Aug. 5, 2010

(30) **Foreign Application Priority Data**  
Jan. 6, 2009 (KR) ..... 10-2009-0000660  
Jan. 6, 2009 (KR) ..... 10-2009-0000661  
Jun. 3, 2009 (KR) ..... 10-2009-0049193

(51) **Int. Cl.**  
**H04N 7/18** (2006.01)  
**H04N 21/4402** (2011.01)  
**H04N 5/445** (2011.01)  
**H04N 21/482** (2011.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **H04N 21/440263** (2013.01); **H04N 5/445** (2013.01); **H04N 21/482** (2013.01); **H04N 21/4263** (2013.01); **H04N 21/4755** (2013.01)

(58) **Field of Classification Search**  
CPC .. H04N 7/50; H04N 7/26941; H04N 21/2365  
USPC ..... 375/240.01-240.29; 725/37-45  
See application file for complete search history.

(56) **References Cited**  
**U.S. PATENT DOCUMENTS**  
5,583,560 A 12/1996 Florin et al. .... 348/7  
7,076,151 B2 \* 7/2006 Chotoku et al. .... 386/241  
(Continued)

**FOREIGN PATENT DOCUMENTS**  
CN 101321254 A 12/2008  
EP 1 096 793 A2 5/2001  
(Continued)

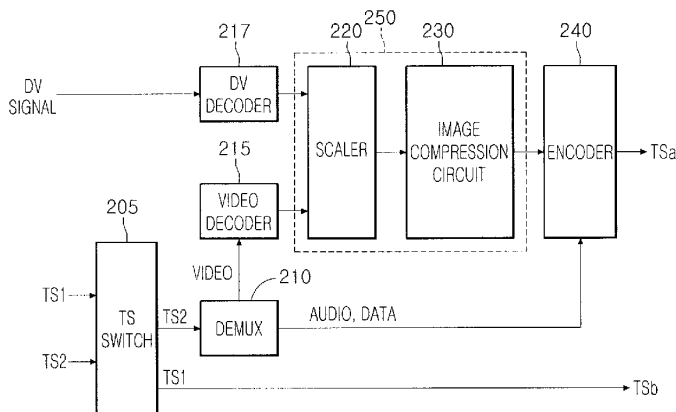
**OTHER PUBLICATIONS**  
PCT International Search Report dated May 25, 2010 issued in Application No. PCT/KR2010/000017.  
(Continued)

*Primary Examiner* — Andy Rao  
(74) *Attorney, Agent, or Firm* — Ked & Associates, LLP

(57) **ABSTRACT**  
An apparatus for processing images may include a de-multiplexer that receives a data stream and de-multiplexes a video signal and channel information from the data stream, a first decoder that provides a decoded video signal, a thumbnail generator coupled to the first decoder to generate at least one of a still picture thumbnail or a moving picture thumbnail based on the decoded video signal, and an encoder coupled to the thumbnail generator and the de-multiplexer. The encoder encodes the thumbnail with the channel information to provide a thumbnail data stream to provide thumbnails of moving pictures and/or still pictures on a display.

**16 Claims, 26 Drawing Sheets**

170-1



US 9,008,190 B2

Page 2

(51) **Int. Cl.**  
*H04N 21/426* (2011.01)  
*H04N 21/475* (2011.01)

KR 10-2006-0031957 A 4/2006  
KR 10-2006-0094401 A 8/2006  
KR 10-2008-0011850 A 2/2008  
KR 10-2008-0035298 4/2008  
KR 10-2008-0057486 A 6/2008  
WO WO 01/26367 4/2001  
WO WO 2007/105876 9/2007

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,849,478 B2 \* 12/2010 Aratani et al. .... 725/37  
2002/0166122 A1 11/2002 Kikinis et al. .... 725/56  
2005/0048916 A1 \* 3/2005 Suh ..... 455/39  
2005/0141856 A1 \* 6/2005 Furuta ..... 386/46  
2006/0064716 A1 \* 3/2006 Sull et al. .... 725/37  
2008/0307458 A1 12/2008 Kim et al.  
2009/0172543 A1 \* 7/2009 Cronin et al. .... 715/721

FOREIGN PATENT DOCUMENTS

KR 10-2004-0067139 A 7/2004  
KR 10-2005-0001057 A 1/2005  
KR 10-2005-0077875 A 8/2005  
KR 10-2006-0015075 A 2/2006

OTHER PUBLICATIONS

Chinese Office Action dated Jul. 3, 2013.  
European Search Report issued in EP Application No. EP 10729271.6 dated Dec. 14, 2012.  
European Search Report dated Jul. 15, 2014 issued in Application No. 10 729 271.6.  
Korean Office Action dated Nov. 24, 2014, issued in Application No. 10-2009-0000660.  
Korean Office Action dated Nov. 24, 2014, issued in Application No. 10-2009-0000661.  
European Office Action for Application 10729271.6 dated Feb. 10, 2015.

\* cited by examiner

FIG. 1

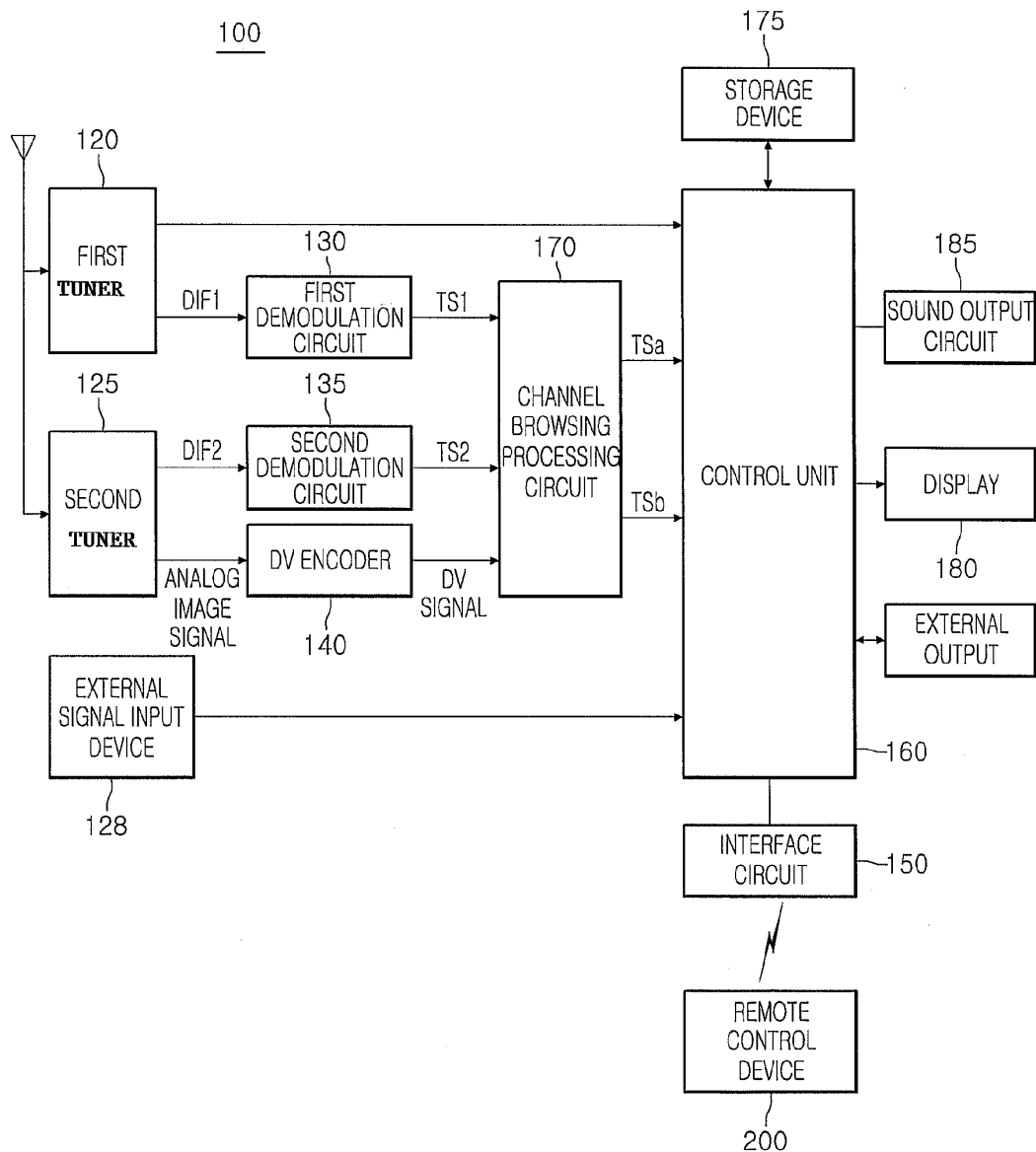


FIG. 2

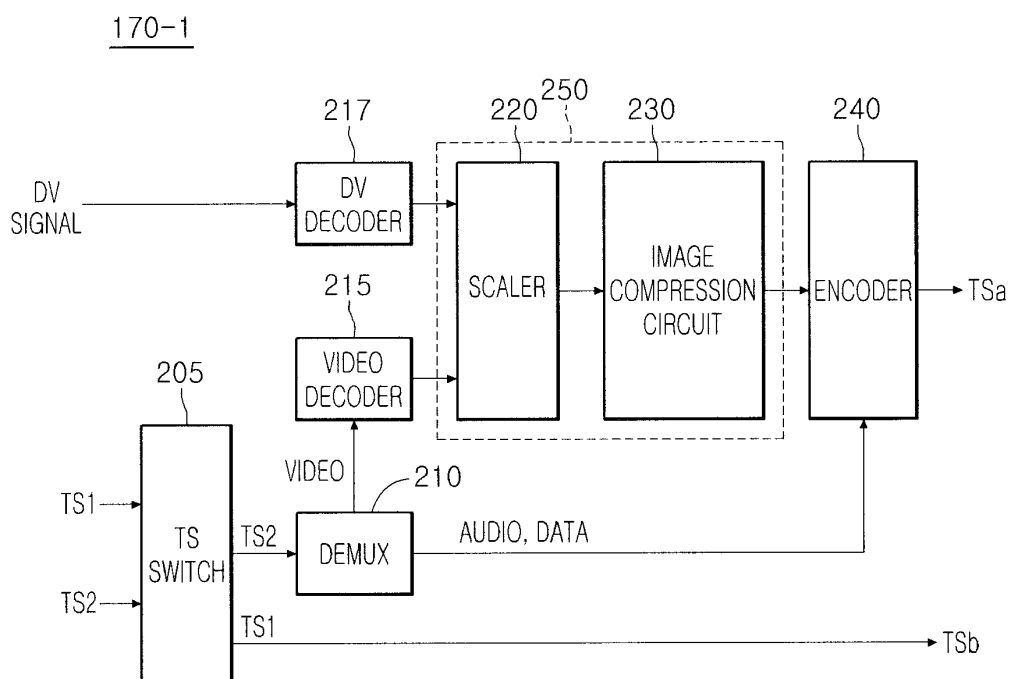
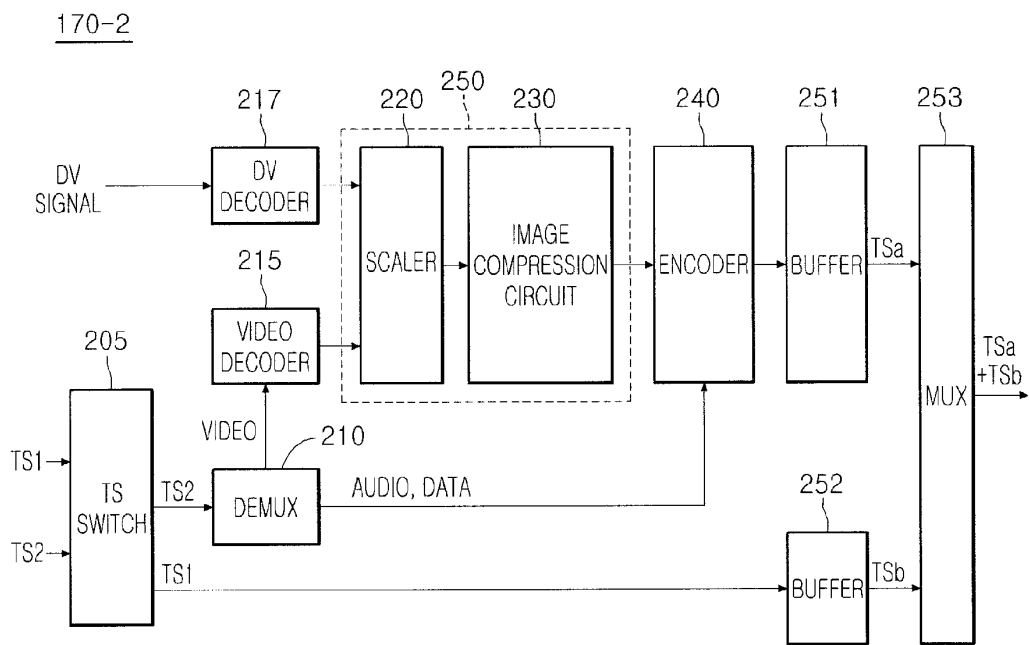


FIG. 3



# 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.