

PATROLL Winning Submission

U.S. Patent No. 11,399,206

U.S. Patent No. 11,399,206 (“*Entropic*” or the “patent-at-issue”) was filed on January 28, 2022. Claim 25 of the patent-at-issue is directed to a method of receiving a television signal from a cable network. The method includes digitizing a contiguous band of frequencies in the signal using an analog-to-digital converter (ADC). The band of frequencies contains all received channels that exist in the signal including the desired and undesired channels. This is followed by selecting only the desired channels and the method is being performed using a digital video recorder.

The primary reference, U.S. Patent No. 8,502,920 (“*Fresco*”), was filed on March 4, 2008, and claim an earliest priority date on March 14, 2007. The patent is directed to a method of processing television signals to provide video and audio information for a desired television signal. The method comprises filtering and amplifying a multi-channel television signal, producing a coarse channel signal. The coarse channel is then digitized to obtain the desired channel signal. Resampling techniques are employed during processing to modify the desired channel signal's normalized bandwidth so that it corresponds to the normalized passband of the main filter used for each broadcast standard.

The secondary reference, U.S. Patent No. 8,902,369 (“*InterDigital*”), was filed on June 16, 2006, and claims priority on the same date. The patent is directed to a system and method of receiving a plurality of digital television channels. The system includes a multichannel receiver circuit to receive multichannel analog RF input signal, and amplifier circuits to generate analog signals which includes bands of frequencies. The system also includes a plurality of analog-to-digital converters to convert the analog signals to digital signals. Additionally, a digital tuner is provided to receive the generated digital signals and recover a plurality of digital RF channels.

A sample claim chart comparing claim 25 of *Entropic* to *Fresco* and *InterDigital* is provided below.

US11399206 (“ <i>Entropic</i> ”)	A. US8502920 (“<i>Fresco</i>”) B. US8902369 (“<i>InterDigital</i>”)
25.pre. A method for receiving a television (TV) signal comprising:	<p>A. US8502920 “1. A television receiver for processing television signals to provide video and audio information for a desired television channel signal, the television signals being transmitted according to a variety of television broadcast standards, wherein the television receiver comprises:” <i>Fresco</i> at claim 1</p> <p>B. US8902369 “The present invention is directed to a method and apparatus for simultaneous reception of a plurality of digital television channels.” <i>InterDigital</i> at col. 2:18-20</p>
25.a. receiving an input signal from a cable network;	<p>A. US8502920 “Referring now to FIG. 2, shown therein is a high-level block diagram of an exemplary embodiment of a universal television receiver 100 that can receive and process digital and analog television signals that are transmitted according to a variety of broadcast signals, and therefore have different television channel signal bandwidths.” <i>Fresco</i> at col. 4:57-62</p> <p>“The wideband television signal 10 is received by the antenna 120 and then amplified by the LNA 122 and the VGA 124.” <i>Fresco</i> at col. 5:56-58</p> <p>“In alternative embodiments, a cable connection, a satellite dish or other wireless connection can be used instead of the antenna 120.” <i>Fresco</i> at col. 5:53-55</p> <p>B. US8902369 “The method of the present invention includes receiving at least one multichannel analog RF input signal;” <i>InterDigital</i> at col. 2:49-50</p> <p>“This combination of components, when employed in the configuration of the present invention, permits substantially simultaneous reception of a plurality of digital cable television channels within a single digital receiver circuit.” <i>InterDigital</i> at col. 3:1-4</p>

25.b. **digitizing a contiguous band of frequencies in the input signal via a wideband analog-to-digital converter (ADC)**, wherein **the contiguous band of frequencies comprises all received channels that exist in the input signal and the received channels comprise a plurality of desired channels and a plurality of undesired channels;**

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“1. A television receiver for processing television signals to provide video and audio information for a desired television channel signal, the television signals being transmitted according to a variety of television broadcast standards, wherein the television receiver comprises:

...

an analog to digital converter (ADC) coupled to the analog processing block **for digitizing the coarse channel signal to produce a digitized coarse channel signal;** and . . .” *Fresco* at claim 1

“FIG. 1B shows that there can be **a wide range in terms of the strength of a desired television channel signal 22, relative to the strength of other channels at nearby frequencies.** For instance, according to the ATSC performance guidelines for digital receivers, **the weakest signal strength for the desired television channel signal 22 that should be correctly received is -83 dBm, while the strongest signal strength is -4 dBm.** Furthermore, **the desired television channel signal 22 may have strong undesired television channel signals 24 and 26 directly adjacent with a relative power of 33 dB.**” *Fresco* at col. 4:40-50

“The television receiver 100 **receives the wideband television signal 10 and provides a processed version of the desired television channel signal 112.**” *Fresco* at col. 4:66-67 through col. 5:1

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“3. A method comprising the steps of:

...

digitizing respective ones of said plurality of RF signals, using a plurality of analog-to-digital converters; . . .”

InterDigital at claim 3

“In accordance with an aspect of the invention, **each analog-to-digital converter 121, 122, 123 may include a frequency selector 211, 212, 213 for setting the sampling frequency and/or input frequency corresponding to the desired band.** For example, **a first analog-to-digital converter 121 may include a first frequency selector 211 including a clock input coupler on which a clock signal is transmitted, indicating the desired sampling frequency of the first analog-to-digital converter 121.**” *InterDigital* at col. 5:62-67 through col. 6:1-2

25.c. **concurrently selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels;** and

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“Rather, the television receiver 100 **uses distributed filtering, in both the analog and digital domains, to isolate a desired television channel signal.**” *Fresco* at col. 5:25-27

“The RF processing block 102 receives and **processes the wideband television signal 10 to provide a multi-channel television signal 136 that can include on the order of tens of television channel signals including the desired television channel signal 22.**” *Fresco* at col. 5:46-51

“The **coarse bandpass filter 150 provides another level of filtering to remove unwanted television channel signals** as well as to prevent aliasing due to subsequent discrete time sampling.” *Fresco* at col. 8:26-29

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“The **digital tuner 130 may include a channel selector 315 to permit selection of one or more particular digital channels desired to be recovered.** For example, **a selected set of digital cable television channels may be communicated to the digital tuner 130 via the channel selector 315** corresponding to a plurality of pay-per-view selections desired by members of a household; the digital tuner 130 may demultiplex only the digital channel signals corresponding to those digital cable television channels.” *InterDigital* at col. 6:25-33

25.d. **providing the plurality of desired channels,**

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“The RF processing block 102 receives and **processes the wideband television signal 10 to provide a multi-channel television signal 136 that can include on the order of tens of television channel signals including the desired television channel signal 22.**” *Fresco* at col. 5:46-51

“The **coarse bandpass filter 150 provides another level of filtering to remove unwanted television channel signals** as well as to prevent aliasing due to subsequent discrete time sampling.” *Fresco* at col. 8:26-29

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“3. A method comprising the steps of:

...

providing a plurality of digital television channel content signals from said plurality of digitized RF signals; and

<p>(cont.) 25.d. providing the plurality of desired channels,</p>	<p>... said providing a plurality of digital television channel content signal step includes selecting a particular number of said plurality of digital television channel content signals as a subset of the number of said plurality of digitized RF signals in response to information on a set of channels selected by a user; said information is communicated to said channel selector input; . . .” <i>InterDigital</i> at claim 3</p>
<p>25.e. wherein the method is performed by a device comprising a digital video recorder (DVR).</p>	<p>A. US8502920 “1. A television receiver for processing television signals to provide video and audio information for a desired television channel signal, the television signals being transmitted according to a variety of television broadcast standards, wherein the television receiver comprises: ... a video processing block configured to receive and process the processed digitized coarse channel signal to provide the video information of the desired television channel signal for analog television broadcast standards or the audio and video information of the desired television channel signal for digital television broadcast standards; and . . .” <i>Fresco</i> at claim 1</p> <p>B. US8902369 “One of skill in the art will appreciate that the invention, as described above, allows a single device to receive a modulated signal at an input and produce a plurality of video signals, or other information signals, related to the modulated signal. This plurality of video signals may then be received at respective devices such as, for example, a television display device, a PVR device, a videocassette recorder device, or any other appropriate signal receiving device.” <i>InterDigital</i> at col. 8:16-23</p>