

Comcast Communications v. Entropic Communications



IPR2024-00432 (9,210,362)
IPR2024-00435 (11,381,866)
IPR2024-00438 (11,399,206)

Lowenstein & Weatherwax LLP
Parham Hendifar

K&L Gates LLP
Jason Engel

Exhibit 2022

All Of Petitioner's Grounds Are Based On Zhang

IPR2024-00432

Ground	References
A	Zhang
B	Zhang
C	Zhang-Pandey
D	Zhang-Mirabbasi
E	Zhang-Mirabbasi-Karabinis
F	Zhang-Jensen
G	Zhang-Mirabbasi-Pandey
H	Zhang-Mirabbasi-Jensen

Pet., 18

IPR2024-00435

Ground	References
A	Zhang
B	Zhang
C	Zhang-Reisman
D	Zhang-Jackson
E	Zhang-Reisman-Jackson
F	Zhang-Pandey

Pet, 11-12

IPR2024-00438

Ground	References
A	Zhang
B	Zhang
C	Zhang-Reisman

D	Zhang-Jackson
E	Zhang-Reisman-Jackson
F	Zhang-Pandey
G	Zhang-Reisman-Pandey
H	Zhang-Pandey-Jackson

Pet, 12-13

Petitioner Fails To Show Independent Claims:

IPR2024-00432 (9,210,362)

1, 11	" select said plurality of desired television channels from said digitized plurality of frequencies "
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IPR2024-00435 (11,381,866)

14, 41, 69	[14C] " each digital down converter ... is operable to generate a digital channel output corresponding to each desired channel " [14D] "to provide each digital channel output via a serial interface "
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1, 27, 55	" DFE is configured to concurrently select and provide each of the plurality of desired channels without providing any of the plurality of undesired channels"
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IPR2024-00438 (11,399,206)

1, 25, 51	" selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels"
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13, 38, 64	[13D] " digitally down converting each desired channel , of the plurality of desired channels, to generate a plurality of digital channel outputs ; [13E] providing the plurality of digital channel outputs via a serial interface "
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'362: "Select" "Desired Channels" "From Said Digitized Plurality Of Frequencies" Comprising Desired And Undesired Channels

US 9,210,362 B2

1. A wideband receiver system comprising:
 - a mixer module configured to downconvert a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels;
 - a wideband analog-to-digital converter (ADC) module configured to digitize said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels;
 - digital circuitry configured to:
 - select said plurality of desired television channels from said digitized plurality of frequencies; and
 - output said selected plurality of television channels to a demodulator as a digital datastream.

'362: Digitized Input Signal With Plurality Of Frequencies Comprising Desired And Undesired Channels

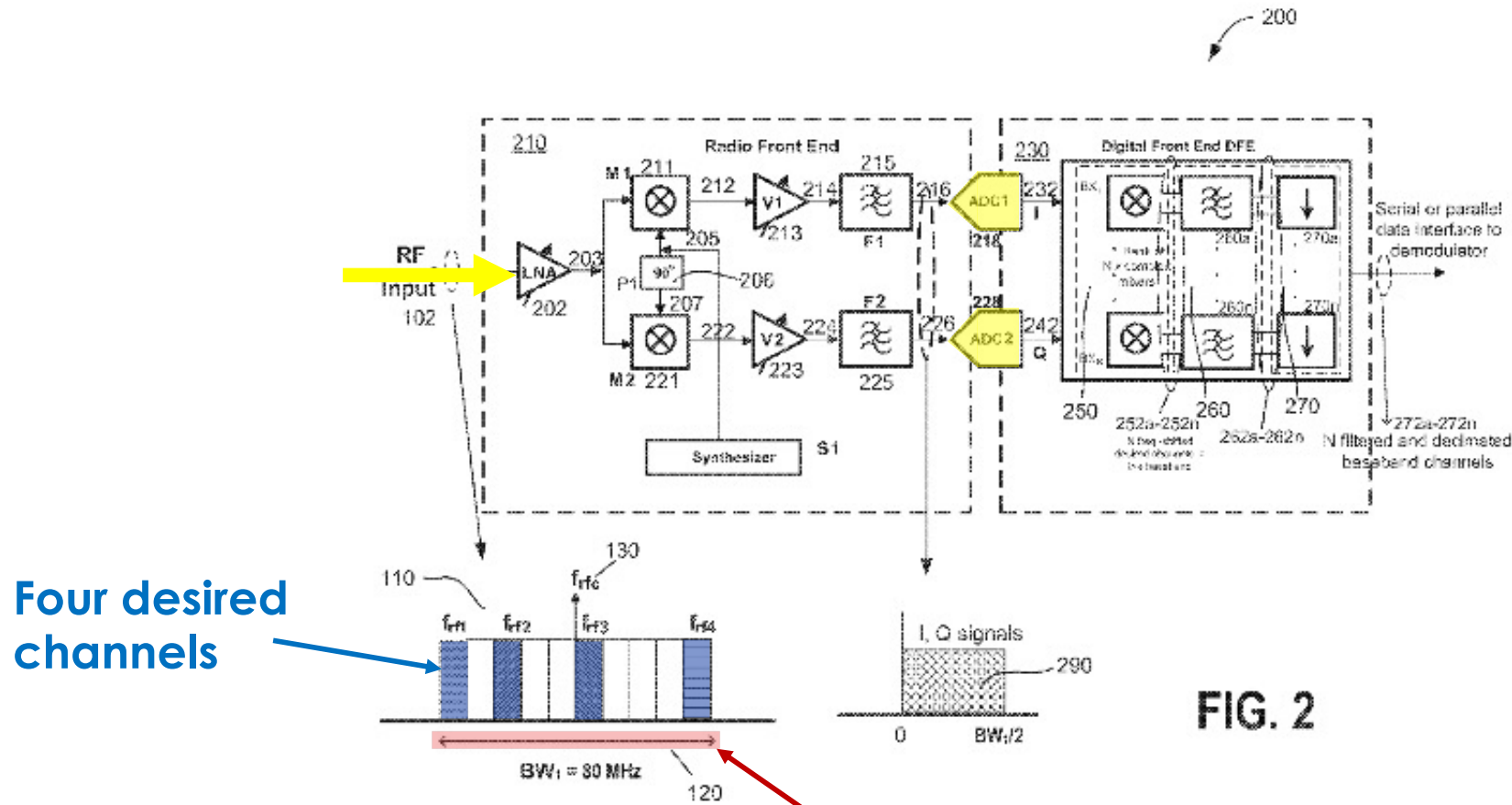
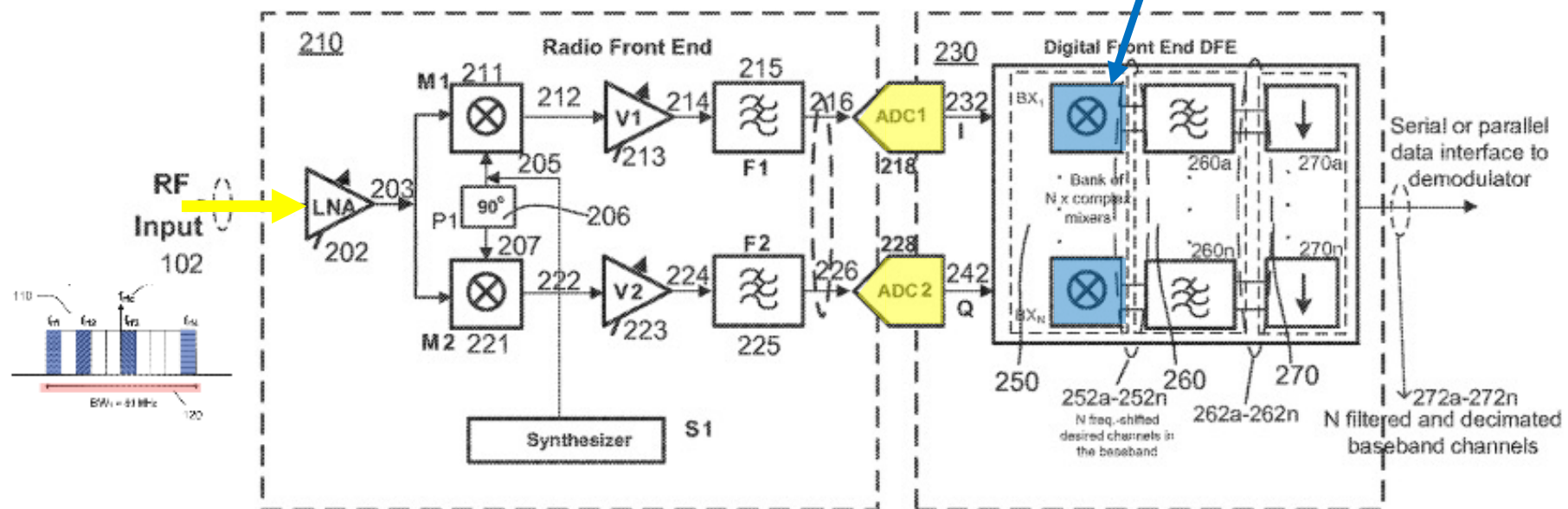


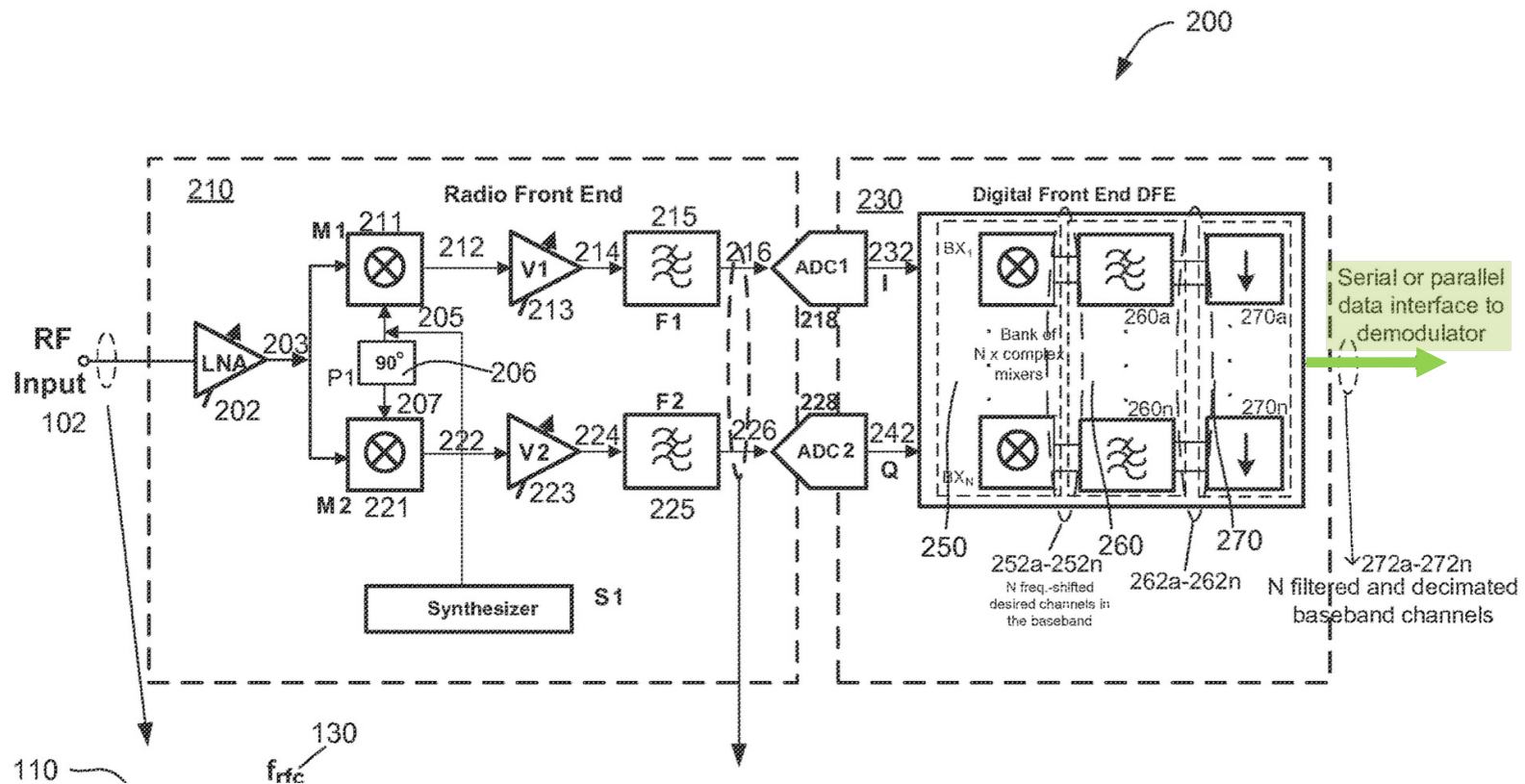
FIG. 2

'362: Select Desired Channels From The Digitized Input Signal Without Selecting Undesired Channels

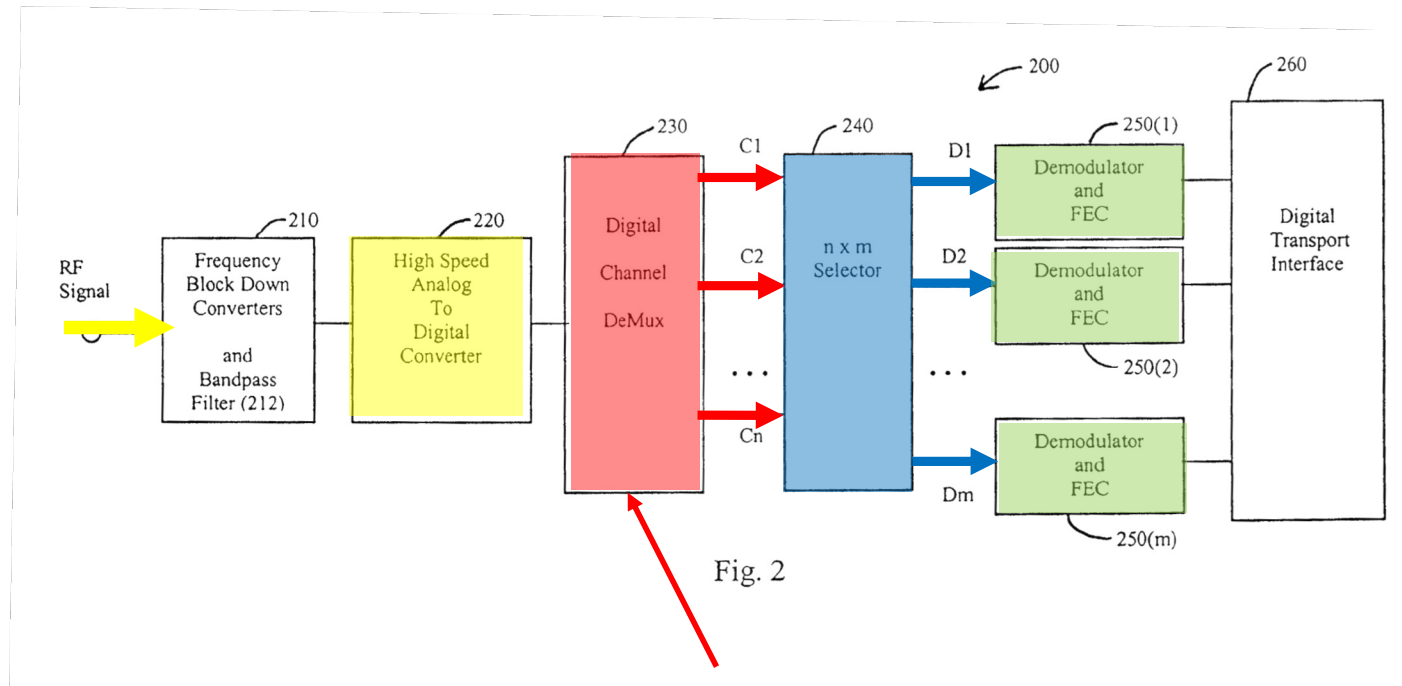
N mixers extract N desired channels from digitized input signal without extracting undesired channels



'362: Only Desired Channels Are Transmitted To Demodulators

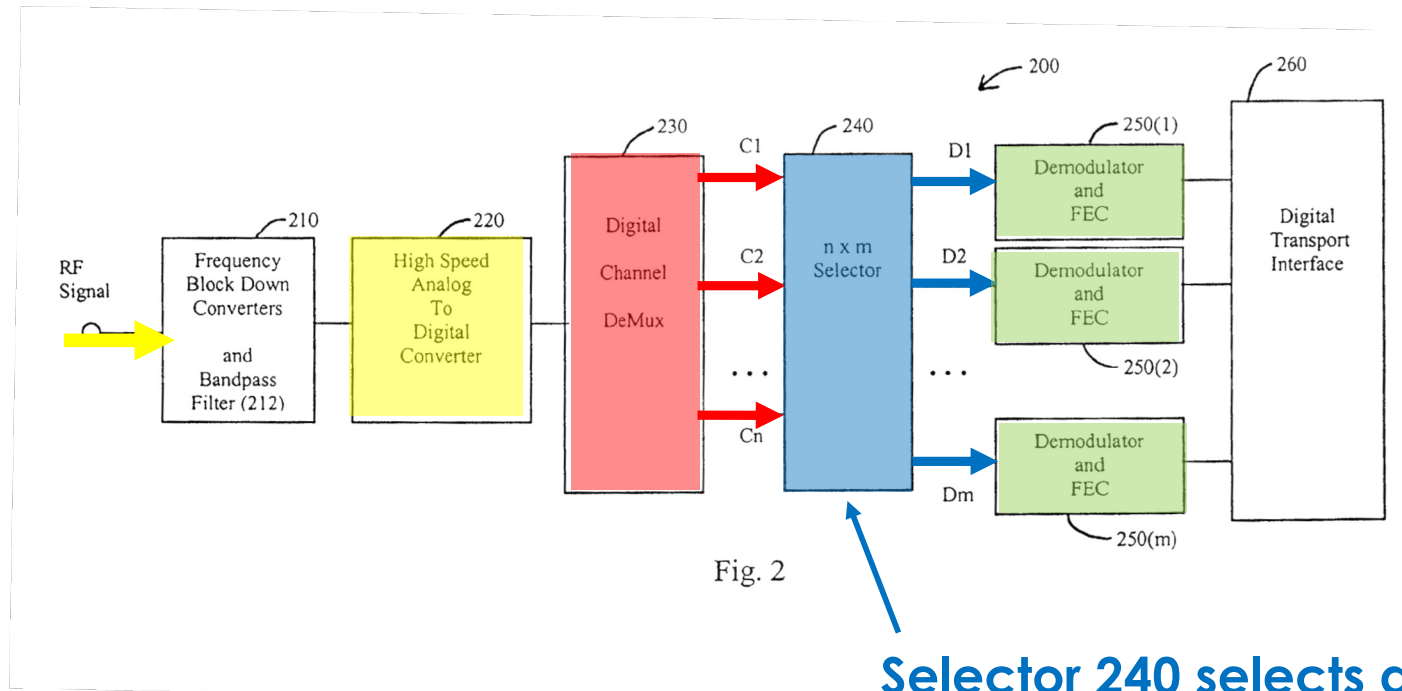


Zhang: Extract All Channels C_1 - C_n From The Input Signal Without Any Selection



Demultiplexer 230 extracts all channels C_1 - C_n , both desired and undesired, in the entire signal band, without selection

Zhang: Selector 240 Selects Desired Channels D_1 - D_m From All Channels C_1 - C_n , Not From Input Signal



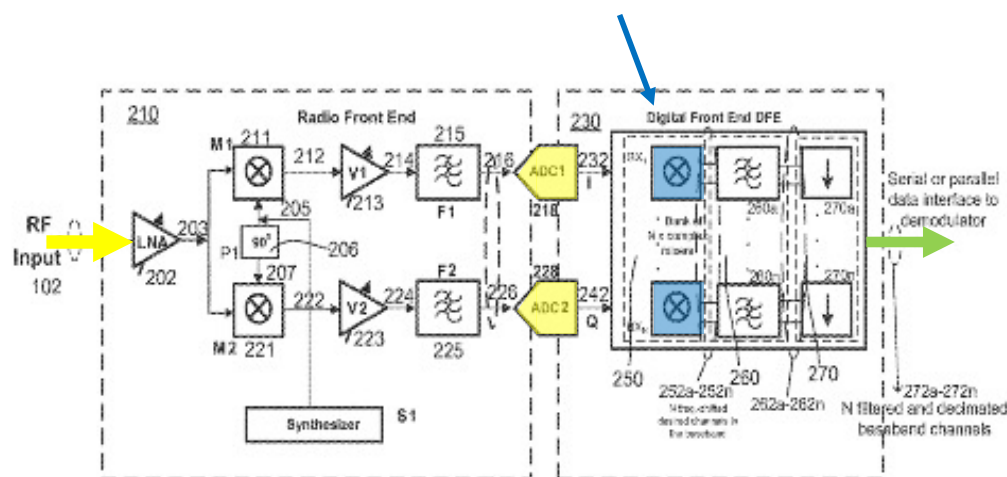
Selector 240 selects desired channels D_1 - D_m from channels C_1 - C_n and sends them to demodulators

'362 And Zhang Have Fundamentally Different Architectures

'362: Selects And Extracts Desired Channels From Input Signal

Zhang: No Selection From Input Signal; Extracts All Channels And Selects Therefrom

Select Desired Channels From Input Signal



Extract All Channels
Selected From Extracted Channels

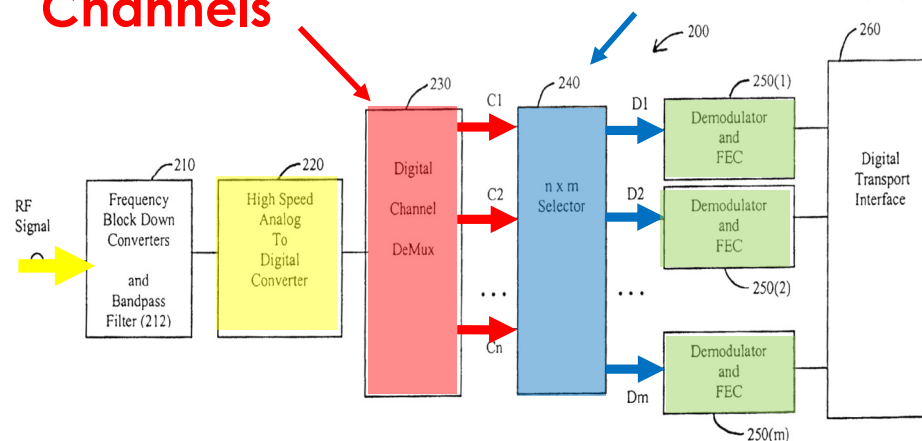


Fig. 2

Petitioner Relies In The Alternative On Zhang Channels (i) C_1 - C_n And (ii) D_1 - D_m As The Claimed “Desired Channels”

'362 Claim 1:

- [1D] select said plurality of desired television channels from
 said digitized plurality of frequencies; and
- [1E] output said selected plurality of television channels to a
 demodulator as a digital datastream.

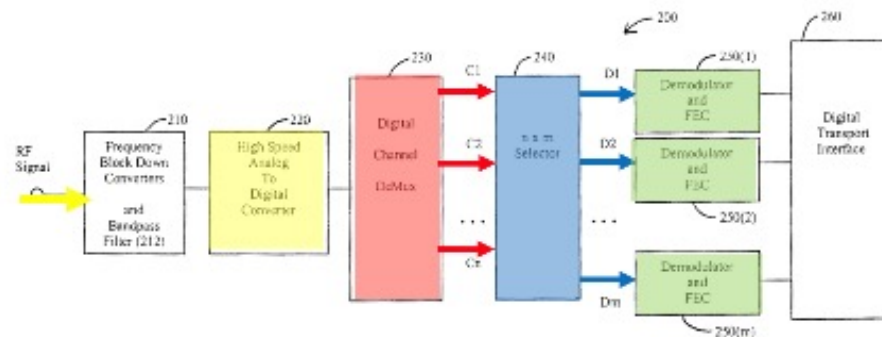


Fig. 2

Channels C_1 - C_n :

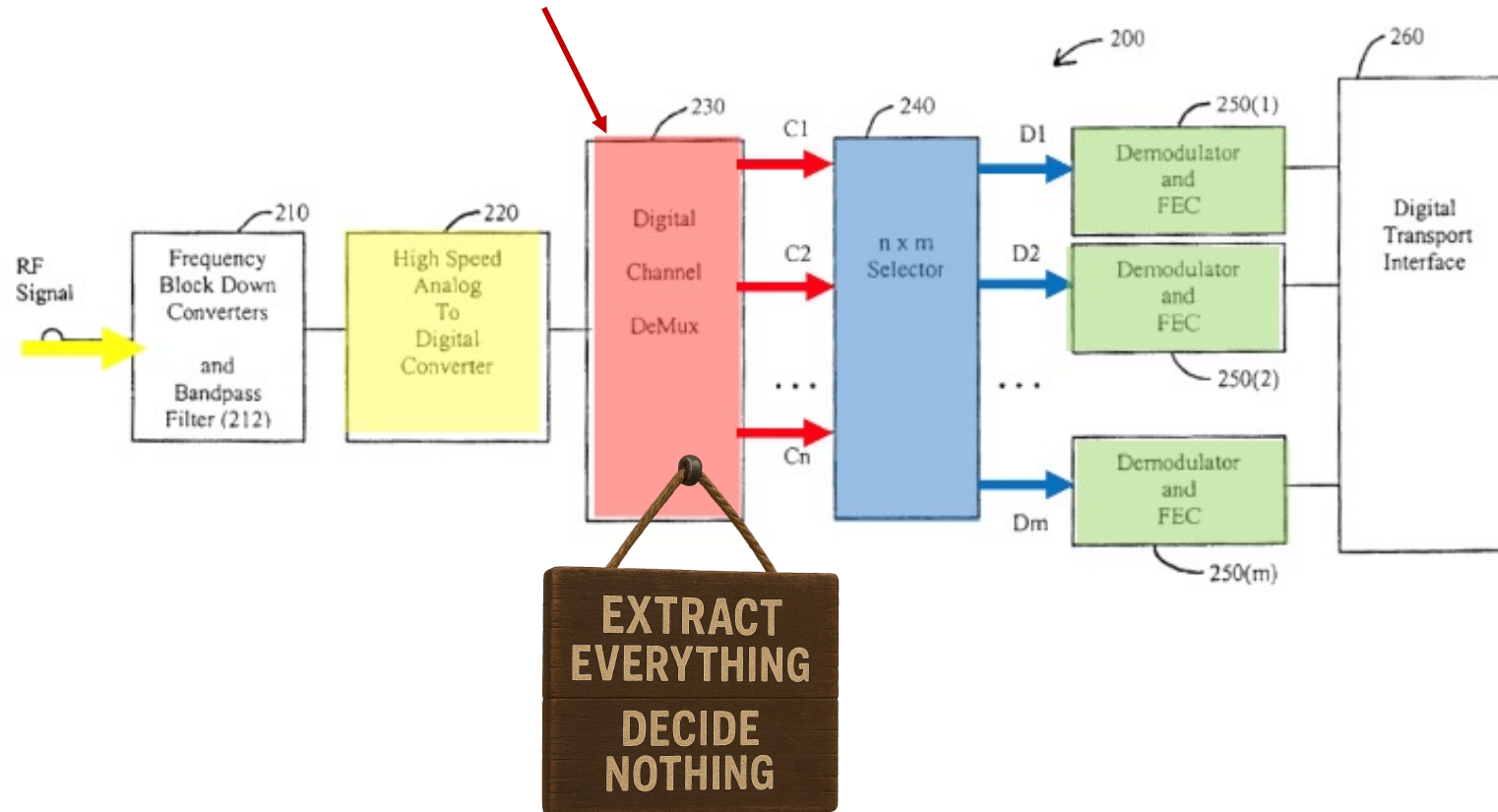
- i. Not “Desired Channels”;
- ii. Not “Selected”;
- iii. Not Same Channels
“Output” In Limitation 1[E]

Channels D_1 - D_m :

- i. No “Selection” Based On
Petitioner’s Construction
- ii. Not Selected “From Said Digitized
Plurality Of Frequencies”

Zhang Channels C_1 - C_n Are Neither “Selected” Nor “Desired Channels”

All Channels C_1 - C_n “In The Entire Signal Band” Indiscriminately Extracted Without Any Selection



Zhang: Lower Case Letter “n” Is The Number Of Channels In “An Entire Signal Band”

Weimin Zhang.

[0027] An ADC 220 then converts the down-converted multi-channel analog RF signal to a multi-channel digital RF signal. In this specific embodiment, ADC 220 is a high-speed ADC so that an entire signal band with n channels can be converted.

Ex. 1013 [Zhang] [0027]

The Only Place Zhang Defines “n”

Petitioner's Expert Agrees: "n" Refers To All Channels, Both Desired And Undesired, Within The Entire Signal Band

DEPOSITION OF DAVID B. LETT

14 Q So you agree that in paragraph 27 of
15 Zhang, in the sentence that says, "In this
16 specific embodiments" -- "embodiment, ADC 220 is a
17 high-speed ADC so an entire signal band with n
18 channels can be converted," end quote. So you
19 agree in this sentence, lower case letter n refers
20 to both desired and undesired channels within the
21 entire band; correct?

22 A It seems to, yes.

Ex. 2018 [Lett-1st-Depo.-Volume-I] 78:14-22

Zhang: Demultiplexer 230 Indiscriminately Demultiplexes All Channels C_1 - C_n In The Digitized Input Signal

Zhang:

[0028] A digital channel demultiplexer 230 then demultiplexes the multi-channel digital RF signal into separate digital RF channels C_1 to C_n . The specific implementation of

Ex. 1013 [Zhang] [0028]

signal to a multi-channel digital RF signal. A digital channel demultiplexer receives the multi-channel digital RF signal from the ADC and demultiplexes the multi-channel digital RF signal into separate digital RF channels.

Ex. 1013 [Zhang] Abstract

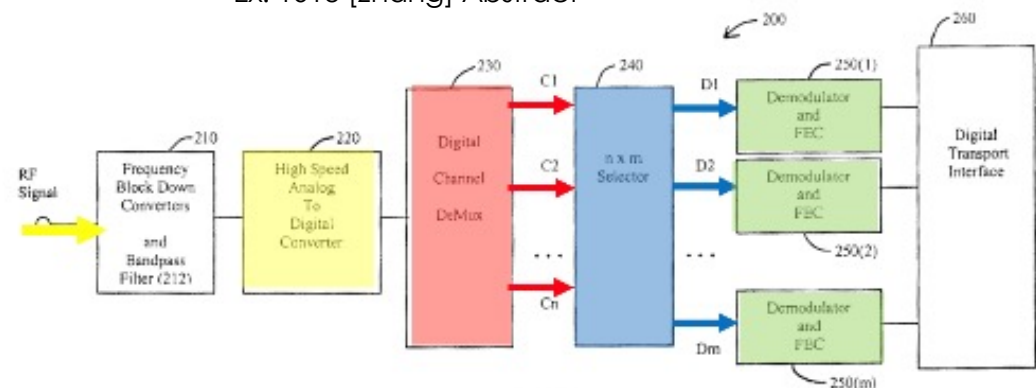


Fig. 2

Zhang: Selector 240 Selects Desired Channels D_1 - D_m From All Channels C_1 - C_n

Zhang:

(FIGS. 2 and 3). Still referring to FIG. 2, an $n \times m$ digital selector 240 receives the demultiplexed digital RF channels C_1 to C_n and then selects one or more of the RF channels D_1 to D_m from one or more of the digital RF channels C_1 to C_n .

Ex. 1013 [Zhang] [0028]

[0039] In operation, digital selector 500 digitally selects one or more RF channels D_1 to D_m from the digital RF channels C_1 to C_n and then sends them to appropriate demodulators or output ports (not shown) through different data buses (not shown). Because a bus clock is much faster

Ex. 1013 [Zhang] [0039]

application. A digital selector 640 digitally selects one or more RF channels D_1 to D_m from the RF channels C_1 to C_n .

Ex. 1013 [Zhang] [0042]

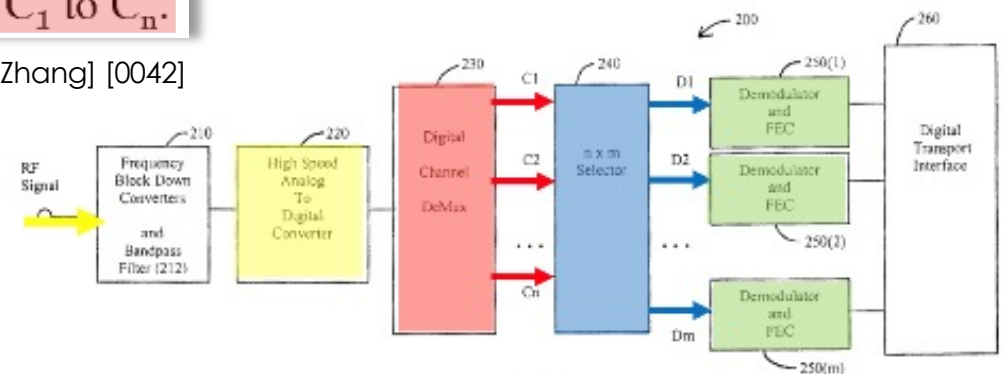


Fig. 2

Petitioner's Expert Confirms: Desired Channels D_1 - D_m Are Selected From Desired And Undesired Channels C_1 - C_n

DEPOSITION OF DAVID B. LETT

6 A So -- so as Zhang discloses, desired and
 7 undesired channels come in and desired channels are
 8 output the demodulator as a digital data stream. So he
 9 doesn't say. And I suppose those undesired channels
 10 just don't get sent out of the -- to the demodulator.

Ex. 2019 [Lett-1st-Depo.-Volume-II] 7:6-10

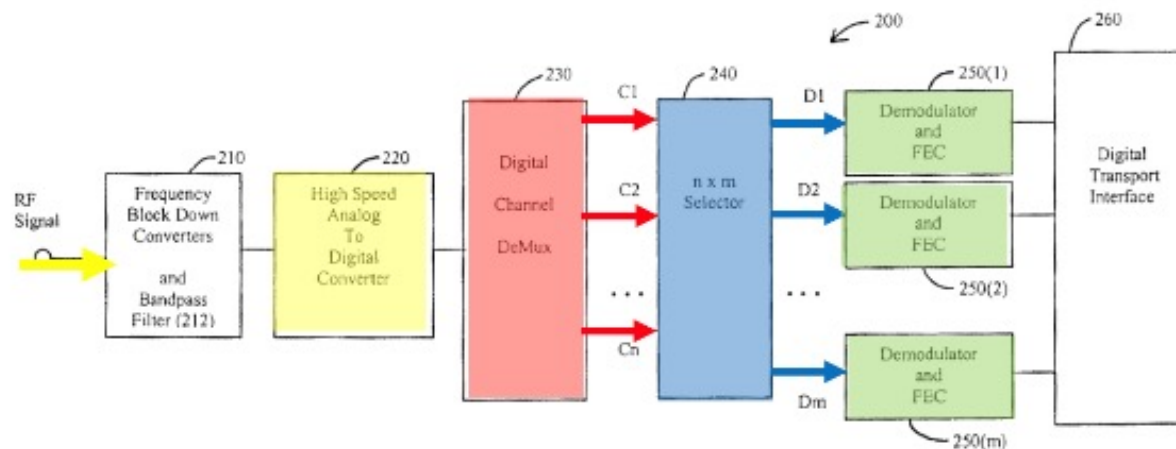


Fig. 2

Zhang European Counterpart Recites A Channel Demultiplexer To Demultiplex C_1 - C_n , And A Selector To Select D_1 - D_m

European Patent Application No. 02759732.7.2415

1. A digital multi-channel demodulator circuit (200, 600) for processing a multi-channel analog RF signal, the multi-channel demodulator comprising:

- a frequency-block down-converter (310, 610) configured to receive the analog RF signal and to shift the analog RF signal to a lower frequency band;
- an analog-to-digital converter (ADC) (220, 620) configured to receive the analog RF signal from the frequency-block down-converter and to convert the analog RF signal to a multi-channel digital RF signal;
- a digital channel demultiplexer (230, 300, 400, 630) configured to receive the digital RF signal from the ADC and to demultiplex the digital RF signal into separate digital RF channels ($C_1 \dots C_n$);
- a selector (240, 500, 620) configured to receive the separate digital RF channels and to select one or more separate digital RF channels ($D_1 \dots D_m$); and
- one or more demodulators (250 (1...m)) configured to receive one or more of the selected digital RF channels ($D_1 \dots D_m$); from the selector and to demodulate the one or more selected digital RF channels.

Ex. 2012 [Zhang-EPO-Reply] 4

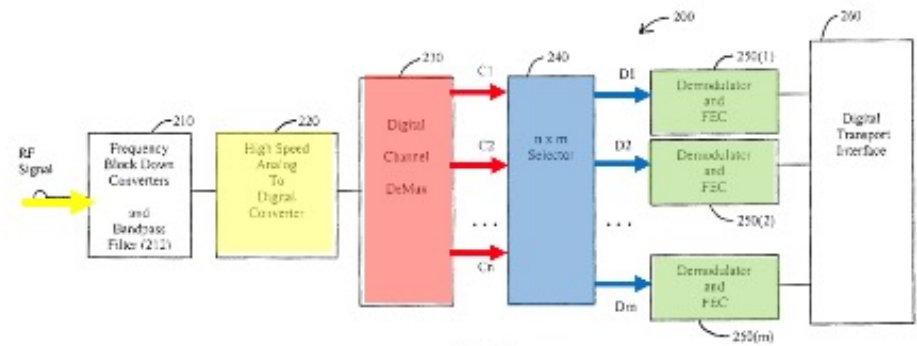


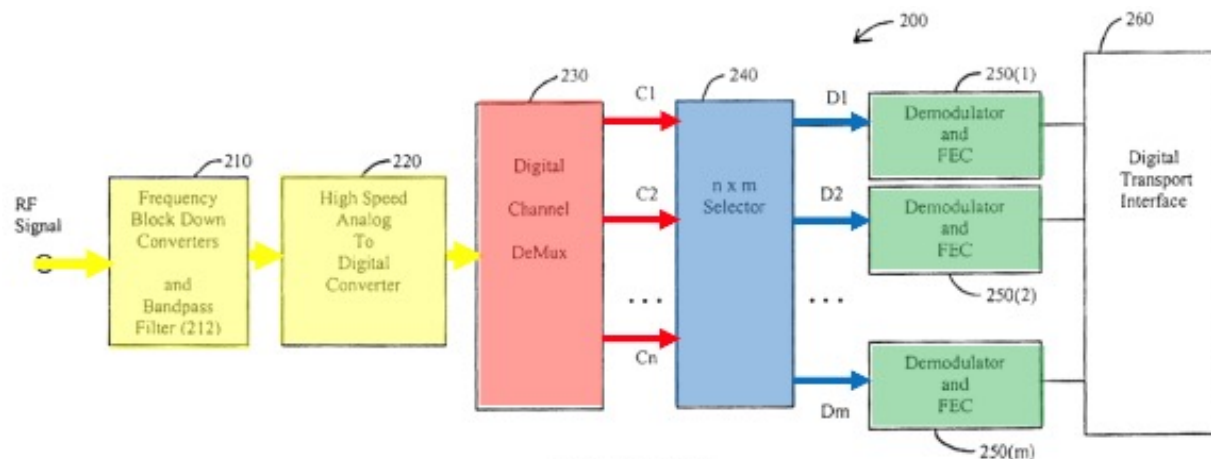
Fig. 2

Zhang European Prosecution: Prior Art Sent “All Of The RF Channels” C_1 - C_n To Demodulators, But Zhang Only Transmits Channels D_1 - D_m

European Patent Application No. 02759732.7.2415

The provision of a selector allows the selection of specific RF channels for demodulation dependant on the specific application in which the apparatus is implemented (paragraph 37 of the application) this allows for power consumption to be optimised because only the selected channels are later demodulated **unlike systems which demodulate all of the RF channels** (e.g. D1 and D2). Thus, the invention provides apparatus which is not only faster, but also dissipates less heat, than systems such as those in D1 and D2, because fewer resources are required when demodulating only the selected RF channels (paragraph 25).

Ex. 2012 [Zhang-EPO-Reply] 2-3



Zhang Fig. 2

Professor Russ: Zhang European Prosecution History Confirms That C_1 - C_n Are All Channels In The Signal Band



DECLARATION OF SAMUEL H. RUSS, PH.D.

49. A POSITA reviewing the above would recognize that from Zhang's applicant's own perspective, the digital channel demultiplexer 230, like Zhang's prior art, demultiplexed both desired and undesired channels C_1 - C_n without performing any selection, and it was Zhang's selector that, unlike Zhang's prior art, only transmitted desired channels D_1 - D_m to demodulators.

Ex. 2009 [Russ-Decl.] ¶ 49

Reply Has No Substantive Response To Zhang European Prosecution Confirmation That C_1 - C_n Are All RF Channels

Zhang European Prosecution: C_1 - C_n Are “All Of The RF Channels”

Zhang is “unlike [prior art] systems which demodulate **all of the RF channels**” C_1 - C_n .

Ex. 2012 [Zhang-EPO-Reply] 2-3

Reply: Patent Owner Did Not Provide Copies Of Zhang’s Prior Art

“PO and Dr. Russ cite the prosecution history in Zhang’s related EPO application (POR, 15-16) but **do not provide the related EPO patent application or the prior art that was allegedly being distinguished.**”

Irrelevant

IPR2024-00432 Reply, 21

Petitioner's Expert Did Not Attempt To Review Any Zhang European Prosecution Documents He Complained Are Missing

DEPOSITION OF DAVID B. LETT

4 A. -- patents?

5 I don't think I looked at any other
6 European patents or documents about European
7 applications other than the ones that Dr. Russ
8 referenced.

9 Q. Did you try to locate either the
10 application or the references cited or anything else
11 from the European prosecution of Zhang?

12 A. So I looked at this analysis from the
13 view of a POSITA. And so the answer is no, I did
14 not.

Ex. 2021 [Lett-2nd-Depo.] 112:5-14

By Design, Zhang Extracts All Channels C_1 - C_n For Quick Selection Of Desired Channels From Already Extracted C_1 - C_n

Zhang.

selected or used by a subscriber. Channel-search capabilities of the digital selector 240 renders it much faster than traditional analog channel switching through RF tuners. This

Ex. 1013 [Zhang] [0028]

DEPOSITION OF DAVID B. LETT

4 being sent to the demodulators, but it's -- I don't
5 think it's wasted. It's really -- it's there for a
6 quick channel change to the new -- to the new desired
7 channel that may be going from an undesired to a desired
8 channel.

Ex. 2019 [Lett-1st-Depo-Volume-II] 8:4-8

If C_1 - C_n Were Not All Channels, Petitioner Does Not Address How Zhang Architecture Would Allow Selecting Unextracted Channels



Petitioner Reliance Upon Zhang's Reference To "Desired" Channels Misapprehends Zhang

PETITIONER'S REPLY

Any dispute as to whether channels C_1 - C_n are desired channels should be resolved by the fact that Zhang refers to each target RF channel that becomes one of the C_1 - C_n channels as either a "desired RF channel" or "desired channel," and refers to other channels filtered out by the demultiplexer as "undesired." Ex. 1013, [0032], claim 34, 36, 37; Pet., 26; Ex. 1002, ¶¶ 105-106; Ex. 1078, ¶ 10. Zhang further states

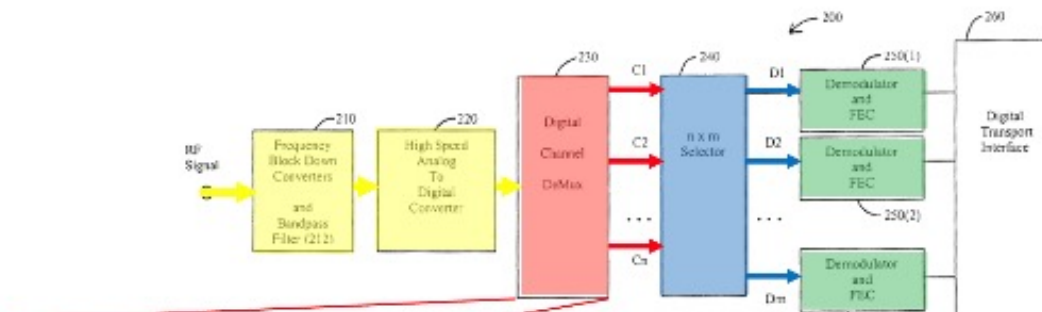
IPR2024-00432 Reply, 15

Zhang Mentions “Desired Channel” In The Context Of Figure 3, Which Implements The Channel Demultiplexer 230

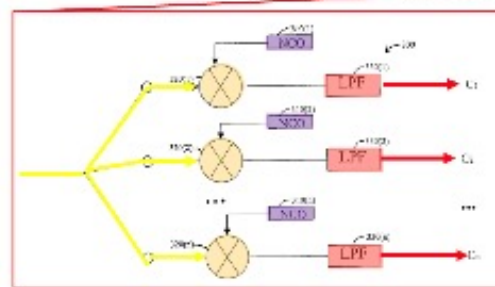
Zhang.

[0030] **FIG. 3** is a simplified high-level schematic diagram of a digital tuner 300, which in some embodiments of the present invention, can be used to implement digital channel demultiplexer 230 of **FIG. 2**. Digital tuner 300

Ex. 1013 [Zhang] [0030]



Zhang Fig. 2



Zhang Fig. 3

Zhang's Figure 3 Discloses Demultiplexer 230 With n Chains, Each Chain Tasked With Extracting One Of Channels C_1 - C_n

Weimin Zhang,

filters (LPFs) 330(1 . . . n). One chain of each of these elements is used for each RF channel. The exact number of

Ex. 1013 [Zhang] [0030]

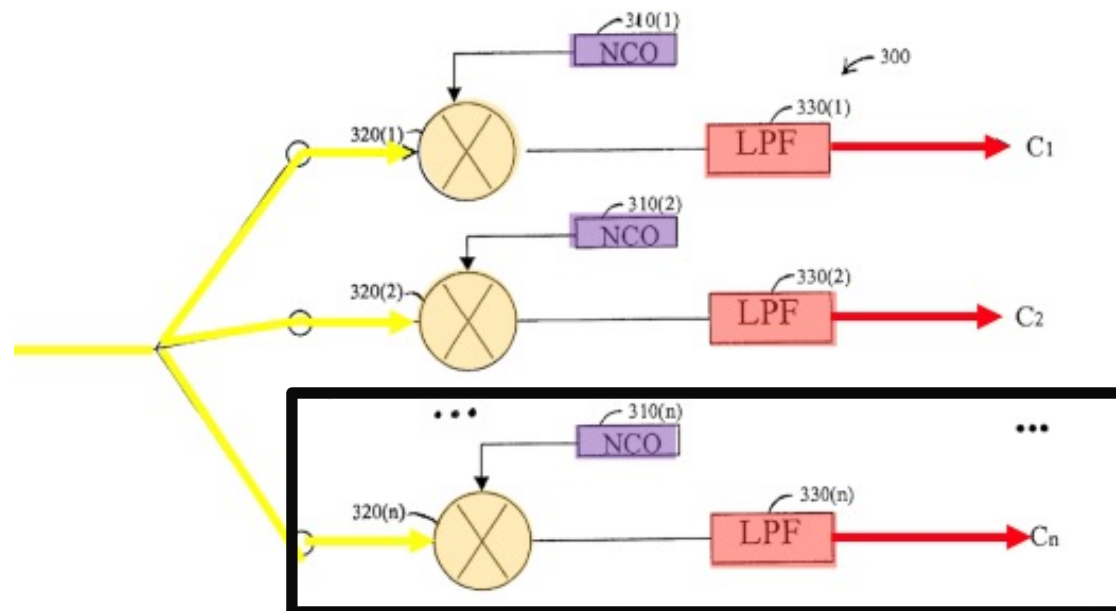


Fig. 3

One Of n Chains

Zhang's Fig. 3: Each Chain Has One Multiplier, One Numerically Controllable Oscillator (NCO), One Low Pass Filter (LPF)

Weimin Zhang,

channel demultiplexer 230 of FIG. 2. Digital tuner 300 includes a bank of n numeric control oscillators (NCOs) 310(1... n), complex multipliers 320(1... n), and low-pass filters (LPFs) 330(1... n). One chain of each of these

Ex. 1013 [Zhang] [0030]

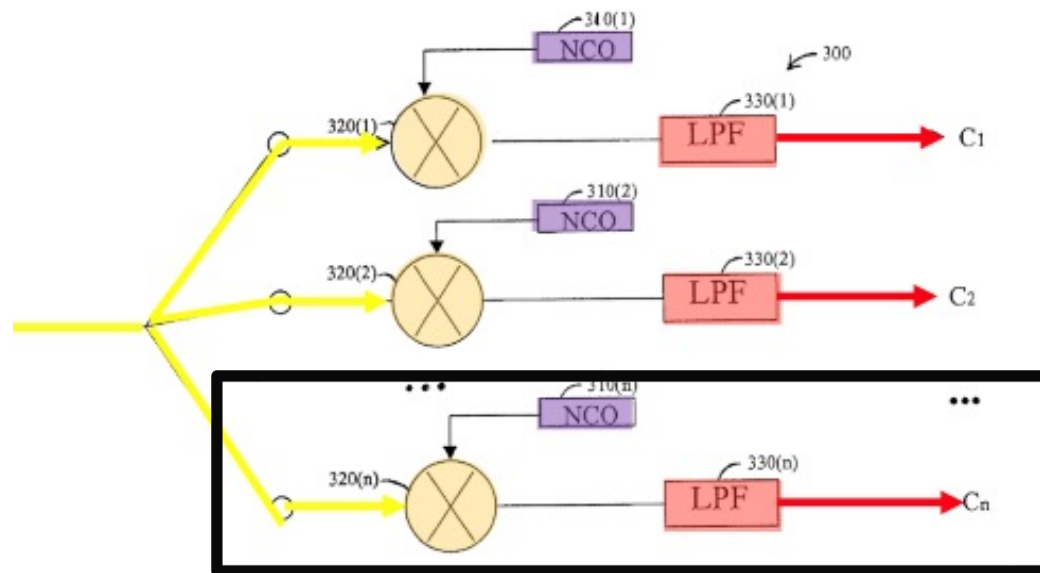


Fig. 3

One Of n Chains

Zhang Fig. 3: Each Chain Downconverts And Extracts One Of Channels C_1 - C_n

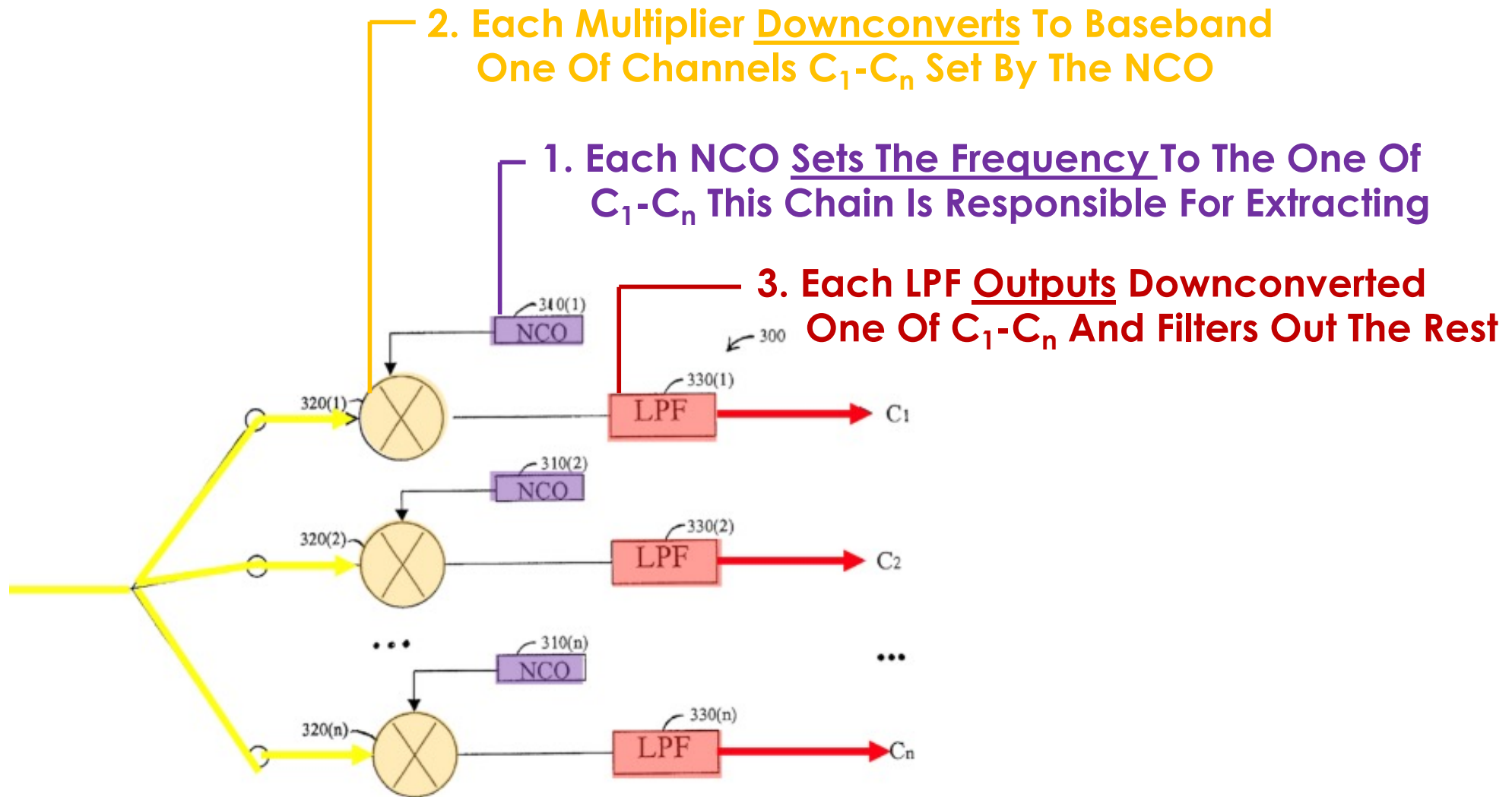


Fig. 3

From The Perspective Of Each Chain, Zhang Refers To “Desired Channel” And “Target Frequency”

“Target Frequency” Is The Frequency Of The One Of C_1 - C_n This Chain Is Responsible For Extracting

“Desired Channel” Is The One Of C_1 - C_n This Chain Is Responsible For Extracting; “Undesired Channels” Are The Rest

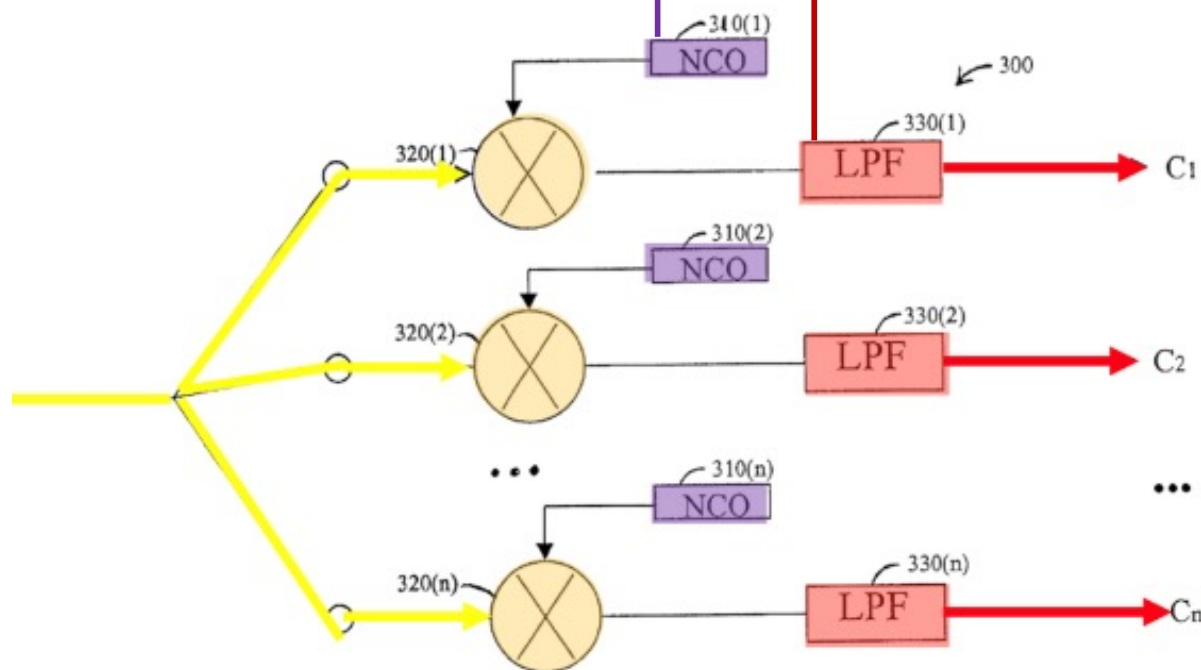
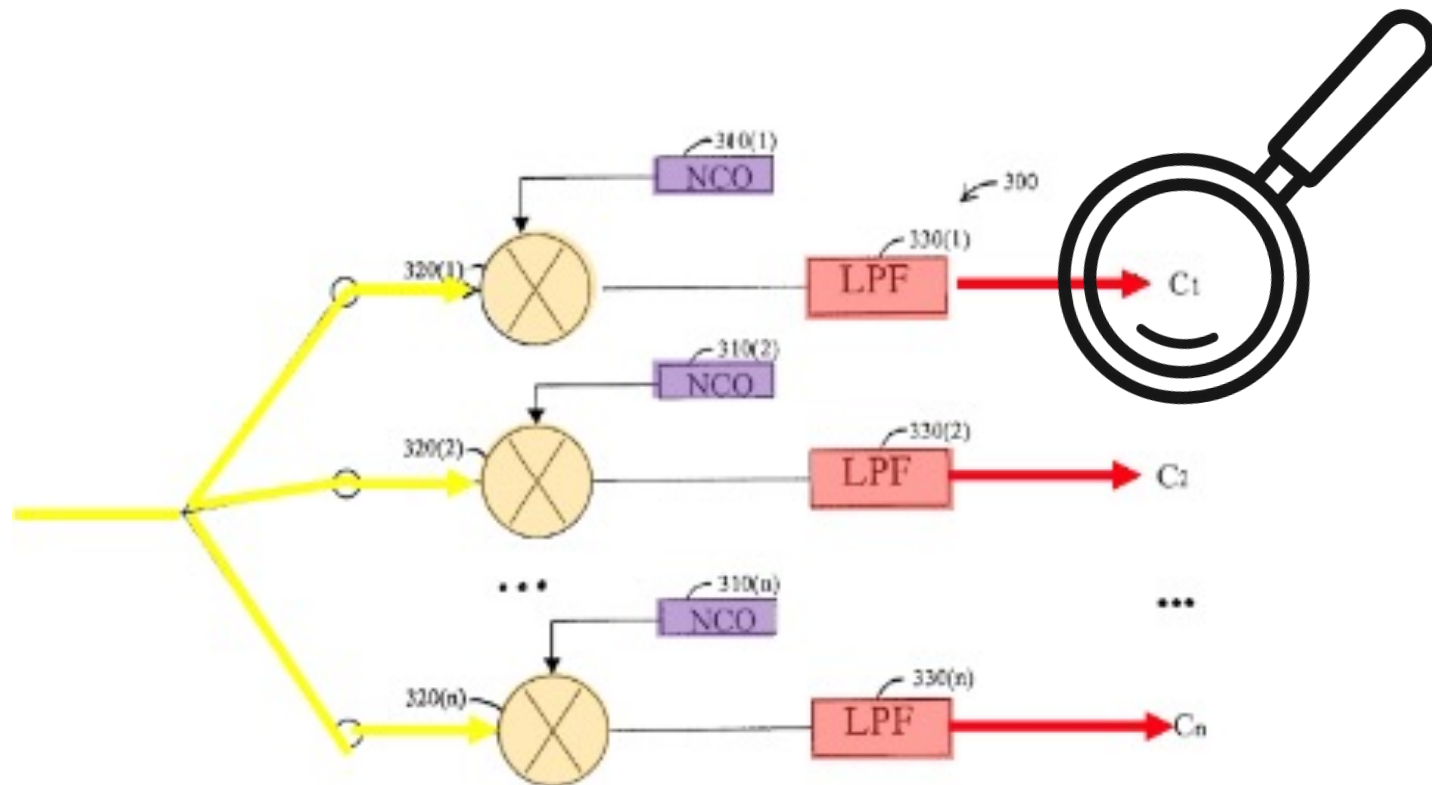


Fig. 3

C_1 In Isolation Is Called “Desired” From The Perspective Of Chain 1 Because C_1 Is The Channel Chain 1 Is Tasked With Extracting



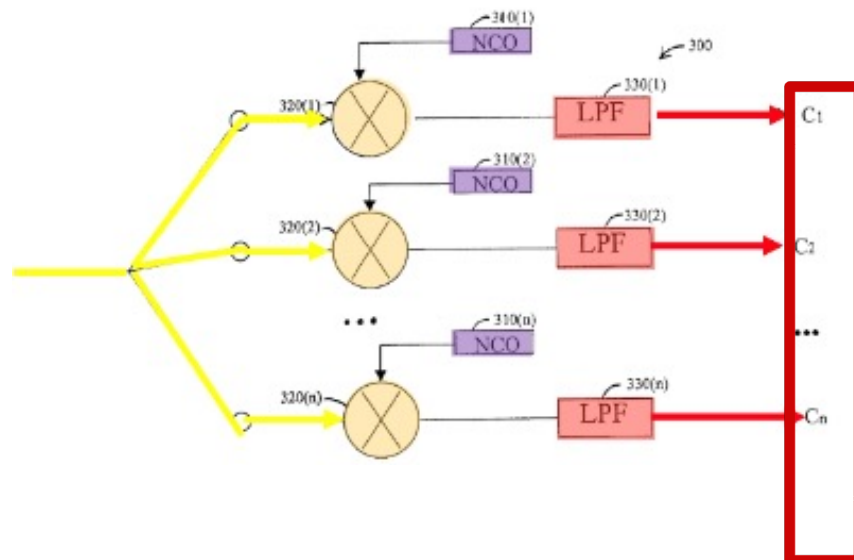
For Claimed “Digital Circuitry,” Petitioner Relied On The Entirety Of Zhang Demultiplexer 230, Not Just One Chain For One Channel

PETITION

Digital Channel Demultiplexer 230 receives the multi-channel digital RF signal from ADC 220 and selects from this signal a number “n” of desired channels $C_1 - C_n$ (green), each at a unique “target” RF channel. Ex. 1013, [0028], [0030]-[0032], claims 1, 2, 10-11, 13, 17, 21, 23, 27-28, 30, 33-34, 36, 41, Figs. 2-3; Ex. 1002, ¶ 113. “RF channels C_1 to C_n contain content channels that are selected or used by a subscriber.” Ex. 1013, [0028], [0030]-[0032], [0042], claims 34, 36-41; Ex. 1002, ¶¶ 113-114.

Pet., 29

Zhang Demultiplexer 230 As A Whole Outputs All Channels C_1 - C_n In “The Entire Signal Band,” Not Just Desired Channels



Demultiplexer 230 As A Whole Outputs All Channels C_1 - C_n In The Entire Signal Band

Ex. 1013 [Zhang] [0027]

Petitioner's Reliance On Zhang's Localized Use Of "Desired Channel" Renders "Desired" Superfluous

US 9,210,362 B2



digital circuitry configured to:
select said plurality of ~~desired~~ television channels from
said digitized plurality of frequencies; and
output said selected plurality of television channels to a
demodulator as a digital datastream.

Every Frequency Is "Desired" From The Perspective Of The Individual Circuit Element Tasked With Processing It

Petitioner Does Not Analyze The Meaning Of The Claimed “Desired Channel” Beyond Zhang’s Incidental Usage Of Similar Terminology



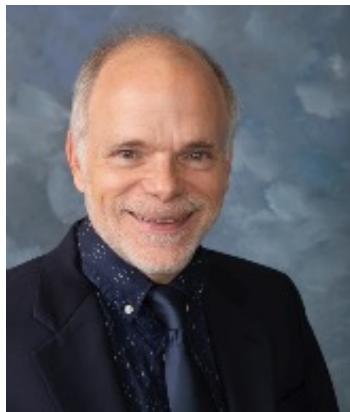
Petitioner's Reliance On Zhang's Claims' Use Of The Phrase "Target" RF Channel Is Similarly Incorrect

PETITION

Digital Channel Demultiplexer 230 receives the multi-channel digital RF signal from ADC 220 and selects from this signal a number “n” of desired channels $C_1 - C_n$ (**green**), each at a unique “target” RF channel. Ex. 1013, [0028], [0030]-[0032], claims 1, 2, 10-11, 13, 17, 21, 23, 27-28, 30, 33-34, 36, 41, Figs. 2-3; Ex. 1002, ¶ 113. “RF channels C_1 to C_n contain content channels that are selected or used by a subscriber.” Ex. 1013, [0028], [0030]-[0032], [0042], claims 34, 36-41; Ex. 1002, ¶¶ 113-114.

Pet., 29

Dr. Russ's Unrebutted Expert Testimony Showed That Zhang Claims Also Closely Follow Its Embodiments



Zhang Claims

34. The method of claim 28 wherein the demultiplexing further comprises:

providing a plurality of select frequencies, each select frequency being associated with a corresponding and separate RF channel; and

multiplying the at least one multi-channel RF signal with each of the select frequencies to obtain separate RF channels.

36. The method of claim 34 further comprising **shifting the target RF channel to a baseband**.

37. The method of claim 34 further comprising **filtering undesired RF channels and passing only the target RF channel**.

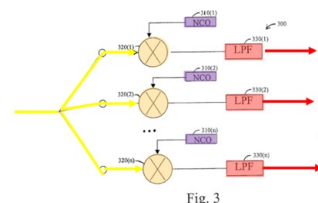
38. The method of claim 37 wherein the filtering is achieved with a **low-pass filter (LPF)**

39. The method of claim 38 wherein the **LPF is a fine impulse response (FIR) filter**.

40. The method of claim 39 wherein the **FIR filter is a high-speed filter**.

41. The method of claim 34 wherein the select frequencies are generated by **numeric control oscillators**.

Zhang Fig. 3 (Annotated)



Unrebutted

Petitioner's Reply: Zhang's Claims Require "One Or More" Circuit Elements

PETITIONER'S REPLY

113. For example, claim 17 recites "one or more low-pass filters (LPF) configured to receive the multi-channel digital RF signal," and claim 21 recites that "at least one complex multiplier configured to receive a multi-channel digital RF signal." In each

IPR2024-00432 Reply, 16

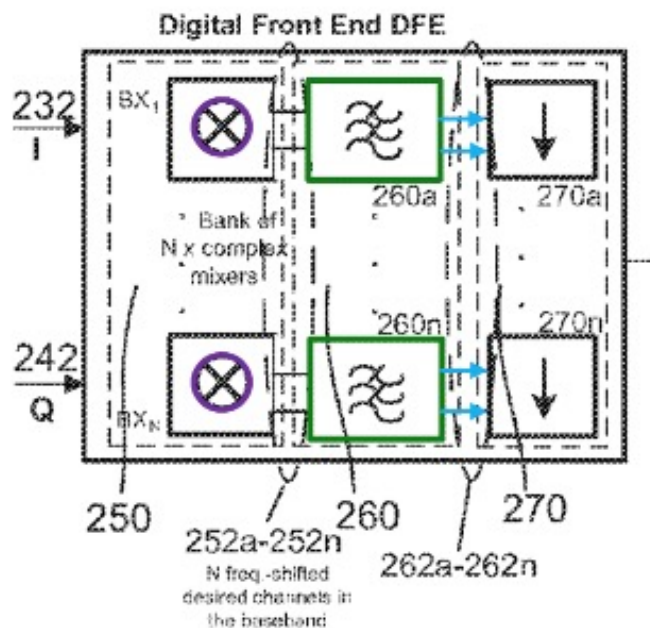
Zhang Claims Do Not Modify Its Specification:

1. Number of circuit elements says nothing about whether channels C_1 - C_n Are All The Channels "In The Entire Signal Band"
2. A circuit element is not limited to one channel
3. The test is not the broadest possible interpretation of Zhang claims, but what Zhang's entire disclosure would teach a POSITA

Petitioner Disregards That “The Same Circuitry” In ‘362 And Zhang By Design Perform Very Different Tasks

‘362’s Mixers And Filters Select Desired Channels

Zhang Mixers And Filters Extract All Channels Without Selection



≠

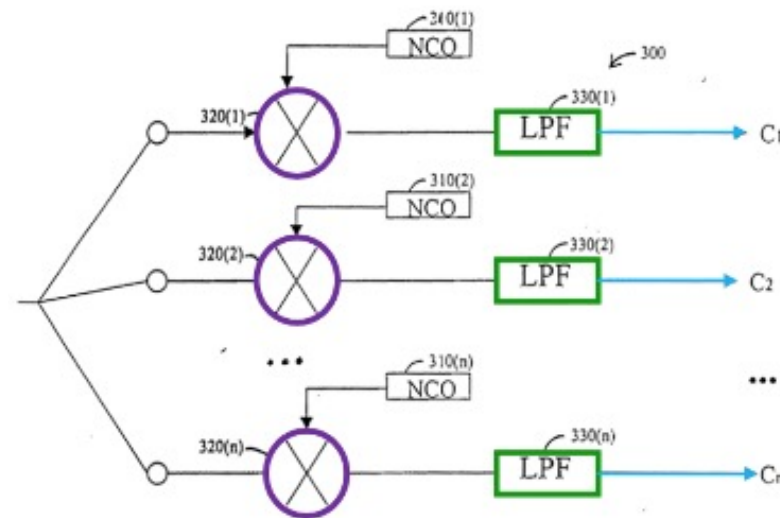


Fig. 3

‘362 Pat. Fig. 2 (excerption and annotation Petitioner’s)

IPR2024-00432 Pet., 30

Ex. 1013 [Zhang] Fig. 3 (annotation Petitioner’s)

IPR2024-00432 Pet., 30

‘362 Patent N ≠ Zhang n

That The “Exact Number” Of C_1 - C_n Depends On The Application Does Not Mean They Are Not All Channels “In The Entire Signal Band”

Weimin Zhang:

[0042] ADCs 620a and 620b convert the multi-channel analog RF signals to multi-channel digital RF signals. A demultiplexer 630 demultiplexes the multi-channel digital RF signal into separate digital RF channels C_1 to C_n . A single multi-channel RF signal can have multiple separate RF signals, e.g., 35 RF channels C_1 to C_{35} per multi-channel RF signal. The exact number will depend on the specific application. A digital selector 640 digitally selects one or more RF channels D_1 to D_m from the RF channels C_1 to C_n .

Reply (at 17) Relies On This Sentence

[0027] An ADC 220 then converts the down-converted multi-channel analog RF signal to a multi-channel digital RF signal. In this specific embodiment, ADC 220 is a high-speed ADC so that an entire signal band with n channels can be converted.

Petitioner Relies On Undisclosed Hypothetical That All Zhang Channels C_1 - C_n May Happen To Be Subsequently Selected

PETITION

Where $D_1 - D_m$ includes all $C_1 - C_n$, Digital Channel Demultiplexer 230 selects the desired channels and filters out the undesired channels as described above. Ex.

IPR2024-00432 Pet., 32

Demultiplexer 230 Does Not Select Anything Even If All Channels C_1 - C_n May Later Happen To Be Selected By Selector 240

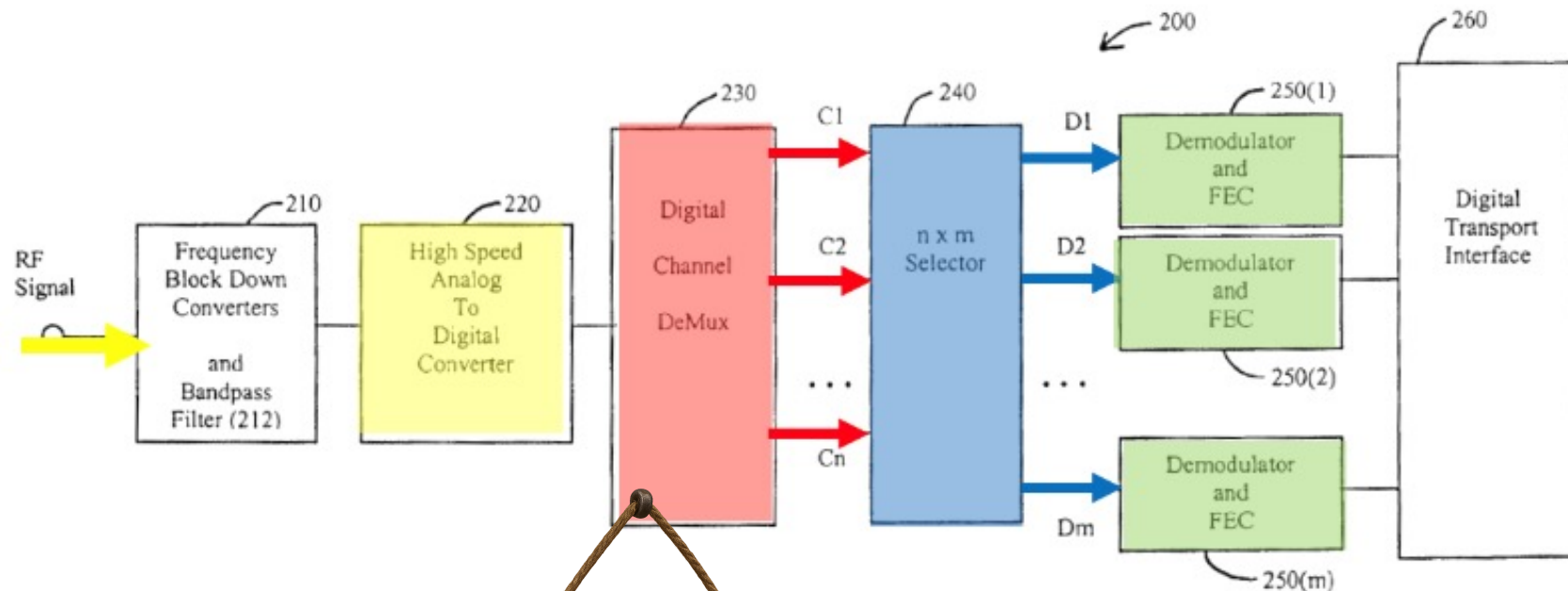


Fig. 2

EXTRACT
EVERYTHING
DECIDE
NOTHING

Theoretical Happenstance That All Channels C_1 - C_n May Be Subsequently Selected Does Not Disclose The Claims

- ***In re Facebook, Inc.***, 743 Fed Appx. 998, 1001-1002 (Fed Cir. 2018) (reversing the Board's anticipation and obviousness determination because even if the examples in the prior art “***happened to result in***” the claimed limitation, “***[n]othing about [the prior art's] algorithm required***” that outcome);
- ***In re Felton***, 484 F.2d 495, 500 (CCPA 1973) (reversing anticipation and obviousness determinations where “***it would be mere happenstance if any structure made according to [the prior art] met the limitations of the claims.***”)



Reply: '362 Discloses Embodiments Where All Channels Are Extracted From The Input Signal

PETITIONER'S REPLY

language. While Dr. Russ describes one alleged embodiment, he conveniently skips over other embodiments described *in the same paragraph* in which N is “equal to the number of *all* available channels that exist in the licensed frequency spectrum” or “*all* receivable channels within a geographic area.” Ex. 1001, 5:36-39 (emphasis

IPR2024-00432 Reply, 23

The Patent's Disclosure Of Different Embodiments Confirms That "N = Desired Channels" Is Different From "N = All Channels"

US 9,210,362 B2

of the analog filtered signal 226. Digital signals I 232 and Q 242 are then applied to a bank of N complex mixers 250, wherein N is an integer value corresponding to the number of desired RF channels located in the non-contiguous portions of the frequency spectrum BW1. It is understood that the number N can be any integer value. In one embodiment, N can be equal to the number of all available channels that exist in the licensed frequency spectrum to provide system flexibility. In other embodiments, N can be equal to the number of all receivable channels within a geographic area. In yet another

Embodiment detailed in the specification and claimed

Petitioner relies on this alternate embodiment disclosed in passing

Ex. 1001 ['362] 5:31-40

Existence Of Alternate Embodiments Does Not Change The Plain Meaning Of “Desired Channels”



“The mere fact that there is an alternative embodiment disclosed in the [patent] that is not encompassed by [our] claim construction **does not outweigh the language of the claim, especially when the court’s construction is supported by the intrinsic evidence.**”

August Tech. Corp. v. Camtek, Ltd., 655 F.3d 1278, 1285 (Fed. Cir. 2011)

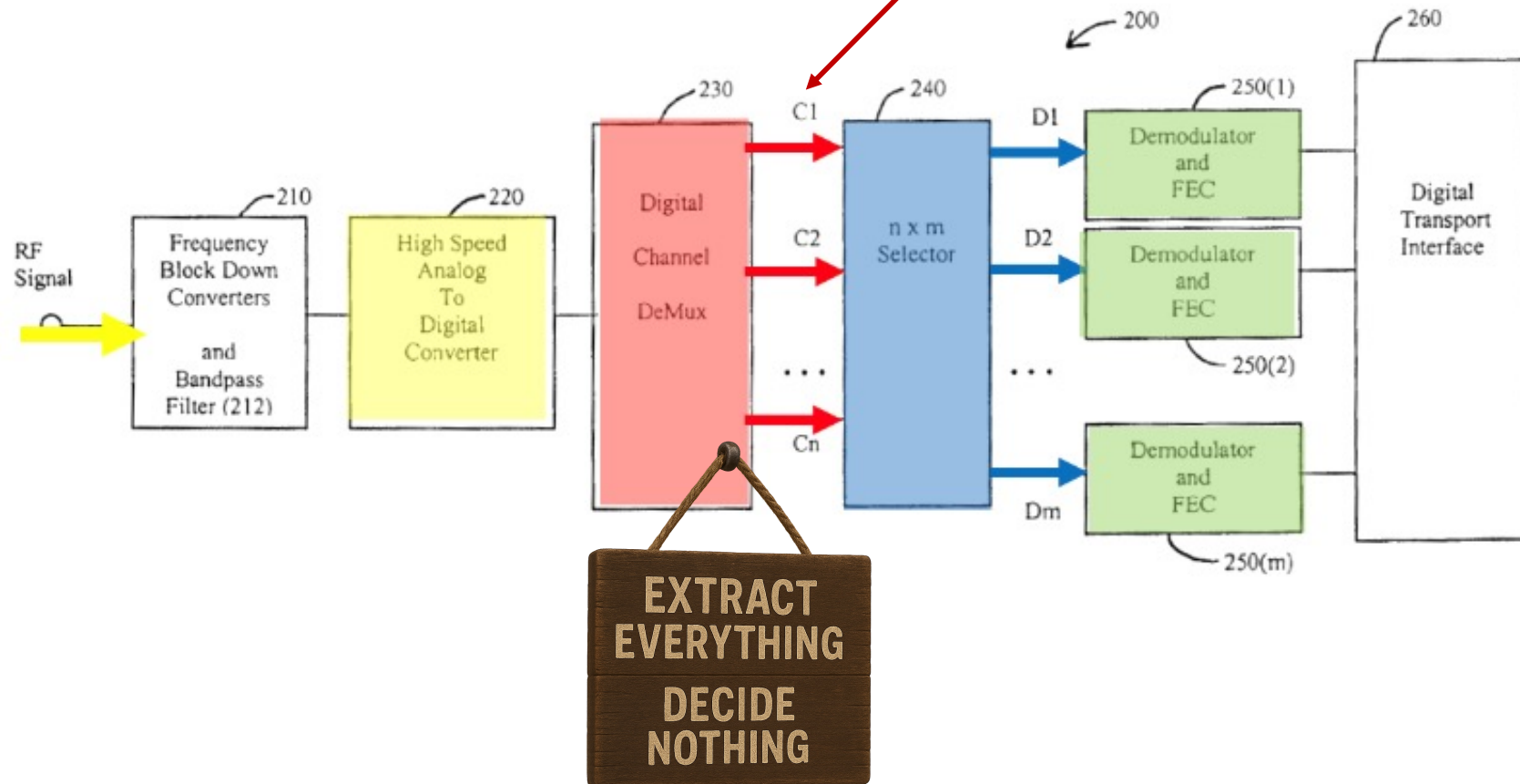
Petitioner Misapprehends Patent Owner's Argument As Requiring Not Selecting Any Undesired Channels

PETITIONER'S REPLY

B. PO Misconstrues “select said plurality of desired television channels” to also Require Not Selecting Any Undesired Channels

As explained above, Zhang discloses selecting desired television channels C_1 - C_n without selecting undesired channels. Moreover, PO's assertion that element [1D] requires this is wrong. PO alleges that extracting all channels from the digitized plurality of frequencies (or extracting even one undesired channel and hundreds of desired channels) is excluded from the claims because the '362 patent allegedly “only selects desired channels from the digitized input RF signal *without selecting any undesired channels.*” POR, 3. But element [1D] places no requirement on how the system treats undesired channels, and PO's argument that “not selecting undesired channels” should be written into the claims is incorrect. Ex. 1078, ¶ 25.

Zhang Demultiplexer 230 Performs No Selection Of Any Channels: Desired, Undesired Or Otherwise



Reply Presents An Untimely New Construction For “Selecting”

Petition:

“All claim terms herein should be given their ordinary and customary meaning to a POSITA as they would be given in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b).”

IPR2024-00432 Pet., 21

Reply:

“Selection is simply extracting a channel from the plurality of frequencies in the digitized RF signal.”

IPR2024-00432 Reply, 24

A Construction Presented For The First Time In Reply Is Untimely



“we will not consider the new construction proposed [for the first time in the Reply] for this claim term.”

Ralph Lauren Corp. v. Lexos Media IP, LLC, IPR2018-01749, Paper 21, 11 (Apr. 3, 2020)

Petitioner's Expert: No Opinion If Indiscriminate Demultiplexing Of All Channels Is "Selecting" Under Petitioner's Construction

DEPOSITION OF DAVID B. LETT

11 Q. So, Mr. Lett, I want to make sure I
12 understood you correctly.

13 In a hypothetical with a television
14 system where a circuitry, all it does is that it
15 takes an input signal and indiscriminately separates
16 out that input signal into its constituent channels,
17 all of its constituent channels without exception,
18 sitting here now you do not have an opinion as to
19 whether that is selecting or not?

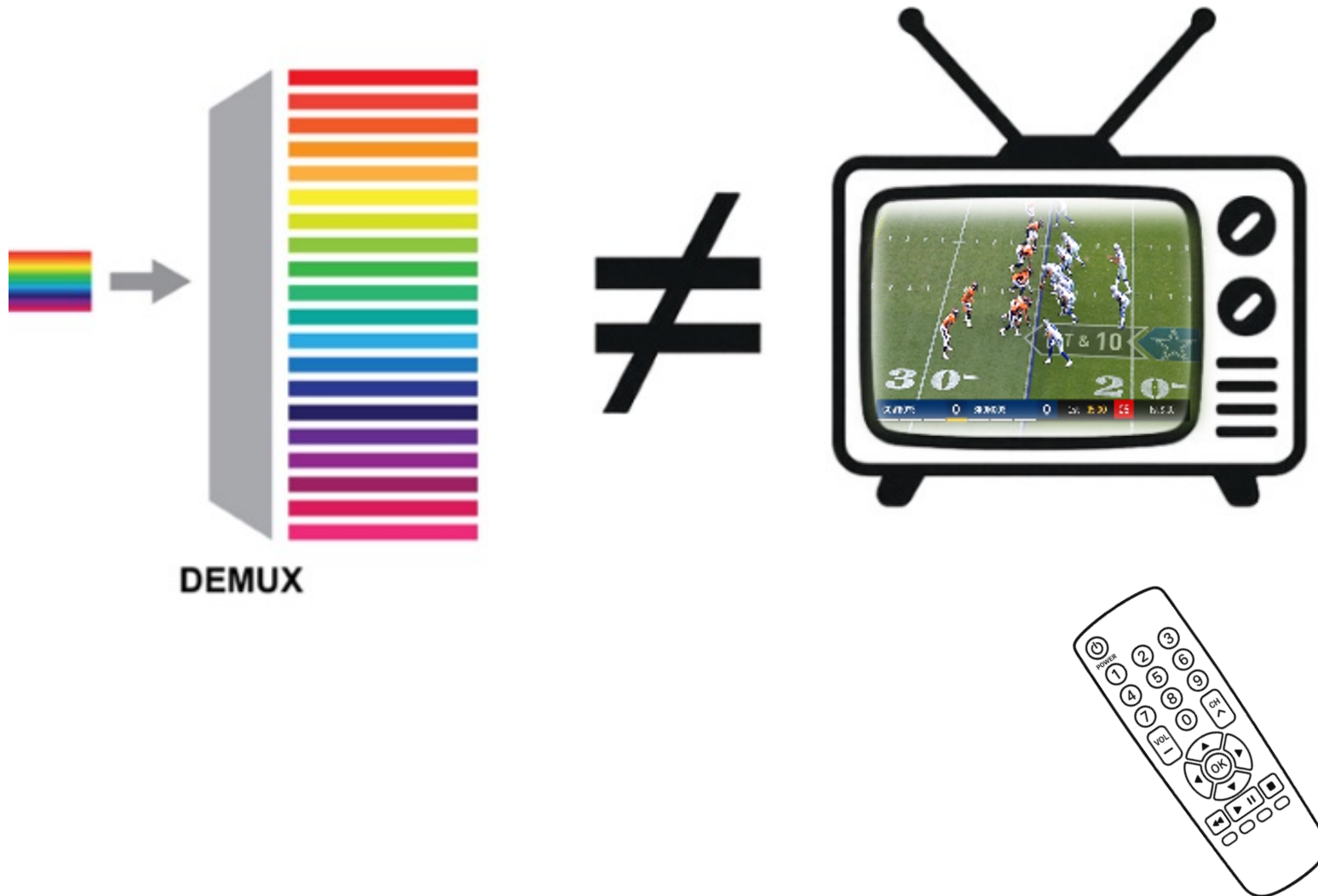
20 Did I understand you correctly?

21 MR. CUVIELLO: Objection. Form and
22 scope.

23 THE WITNESS: Yeah. I do not have an
24 opinion on that hypothetical system, because I have
25 not seen the details of that hypothetical system.

Ex. 2021 [Lett-2nd-Depo.] 49:13-25

Zhang Indiscriminate Demultiplexing Of All Channels Is Not “Extracting A Channel” Under Petitioner’s Construction Of “Selecting”



Petitioner's Attempt To Make Zhang Channels C_1 - C_n "Desired Channels" For [1D] Contradicts Its Mapping For Limitation [1E]

US 9,210,362 B2

digital circuitry configured to:

[1D]

select said plurality of desired television channels from
said digitized plurality of frequencies; and

[1E]

output said selected plurality of television channels to a
demodulator as a digital datastream.

[1E]: "said selected" desired
channels output to demodulators

Petitioner's Attempt To Make Zhang Channels C_1 - C_n "Desired Channels" For [1D] Contradicts Its Mapping For Limitation [1E]

US 9,210,362 B2

digital circuitry configured to:

[1D]

select said plurality of desired television channels from
said digitized plurality of frequencies; and

[1E]

output said selected plurality of television channels to a
demodulator as a digital datastream.

Petitioner maps C_1 - C_n as
"desired channels"

Zhang outputs D_1 - D_m
to demodulators

Petitioner Relies On Zhang Data Bus 1 In Its Figure 5 As Transmitting A Plurality Of Channels To A Demodulator

US 9,210,362 B2

digital circuitry configured to:

[1D] select said plurality of desired television channels from said digitized plurality of frequencies; and

[1E] output said selected plurality of television channels to a demodulator as a digital datastream.

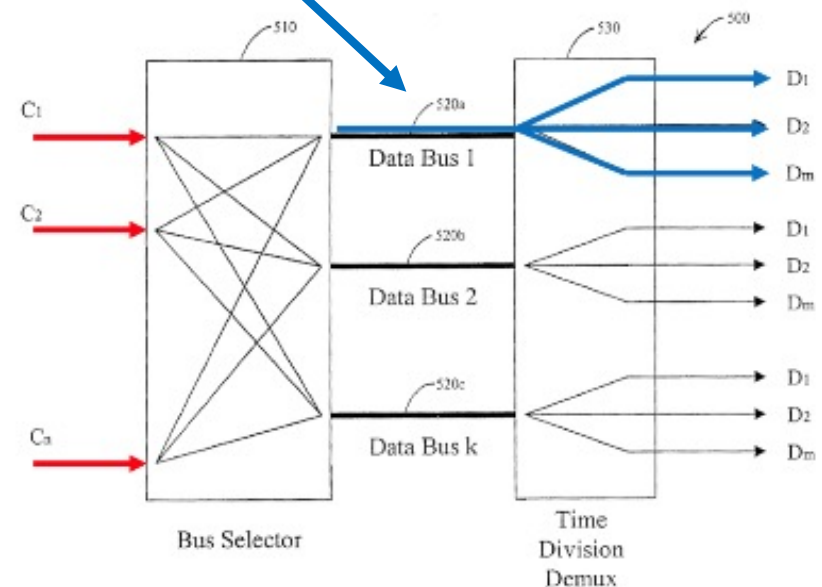
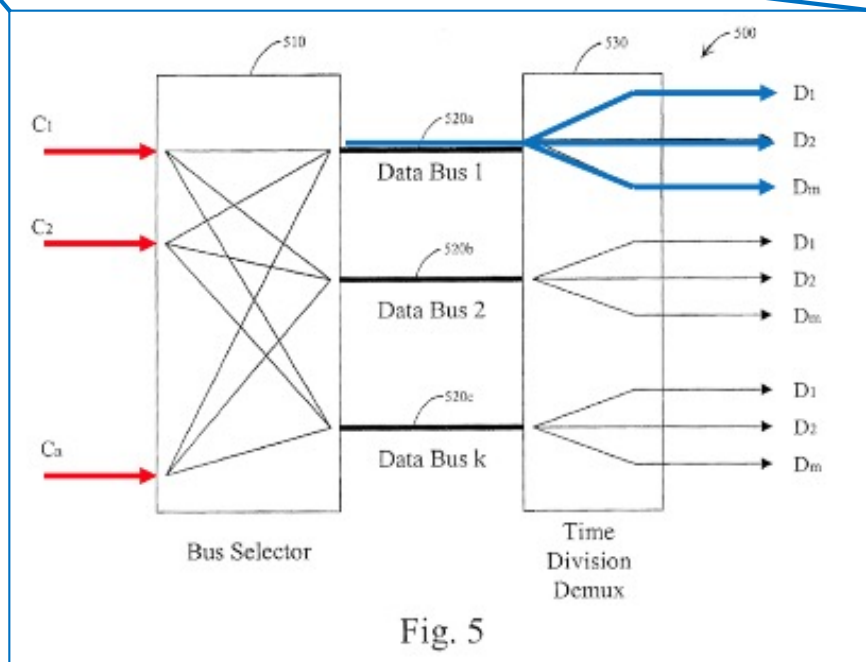
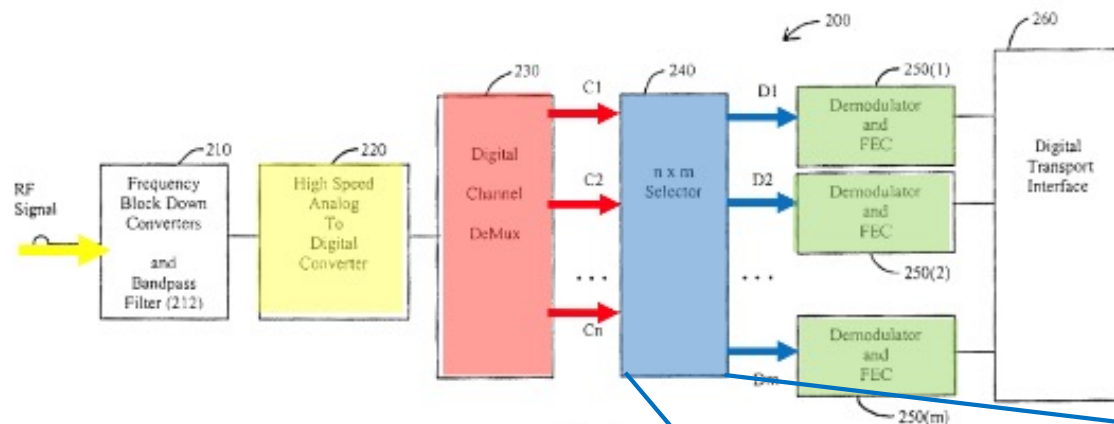
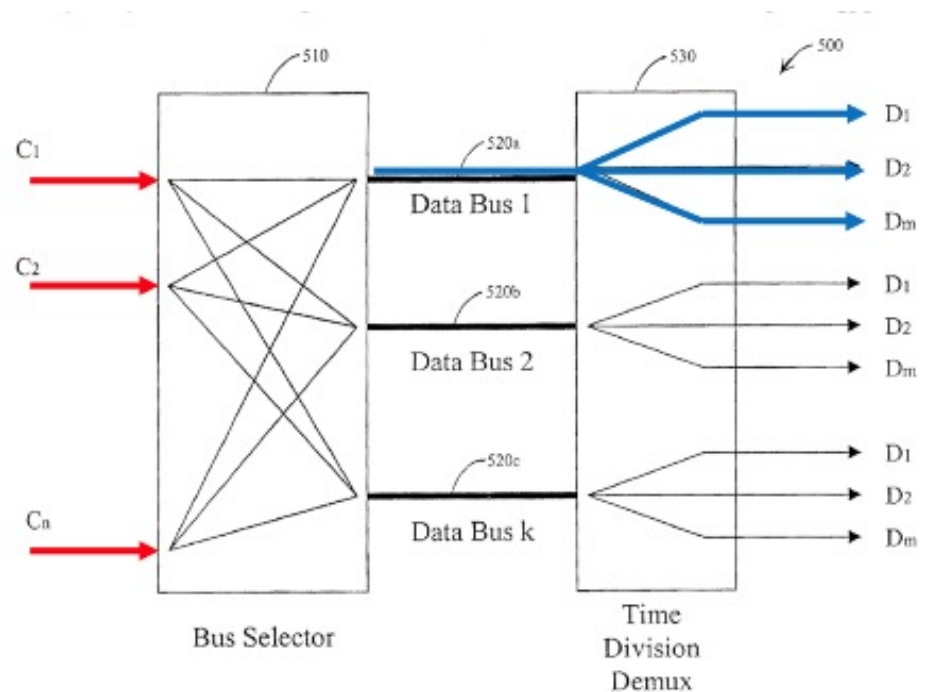


Fig. 5

Zhang Figure 5 Implements Its Selector 240 That Selects Channels D_1 - D_m From All Channels C_1 - C_n



What Is Output To Demodulators In Zhang Figure 5 Are Channels D_1 - D_m , Not Channels C_1 - C_n



Weimin Zhang,

Fig. 5

[0039] In operation, digital selector **500** digitally selects one or more RF channels D_1 to D_m from the digital RF channels C_1 to C_n and then sends them to appropriate demodulators or output ports (not shown) through different data buses (not shown). Because a bus clock is much faster

Summary: Zhang Channels C_1 - C_n Are Not The Claimed “Desired Channels”

C_1 - C_n Are All Channels, Not “Desired Channels”

- **Zhang Defines n:** C_1 - C_n are all channels “in the entire signal band.”
Ex. 1013 [Zhang] [0027]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 78:14-22
- **Architecture:** A selector subsequently selects desired channels D_1 - D_m .
Ex. 1013 [Zhang] [0028], [0039], [0042]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 7:6-10
- **Design Goal:** By design extracts all channels C_1 - C_n to permit quick selection.
Ex. 1013 [Zhang] [0028]; Ex. 2019 [Lett-1st-Depo-Volume-II] 8:4-8
- **EU Prosecution:** Confirms channels C_1 - C_n are “all of the RF channels.”
Ex. 2012 [Zhang-EPO-Reply] 2-3

C_1 - C_n Are Not Selected

- **Not selected:** indiscriminately demultiplexes all channels without selection
Ex. 1013 [Zhang] [0028]; Abstract.
- **Petitioner’s Construction:** select $\neq$ indiscriminate demultiplexing of all channels
Ex. 2021 [Lett-2nd-Depo.] 49:13-25; IPR2024-00432 Sur-Reply, 12-13

C_1 - C_n Cannot Satisfy Limitation 1[E]:

- **Inconsistent Mapping:** C_1 - C_n for [1D] are not the same “plurality of television channels” output to demodulators in [1E]

IPR2024-00432 POR, 28-29, Sur-Reply, 17

Petitioner Alternatively Relies On Zhang's Channels D_1 - D_m As The Claimed "Desired Channels"

'362 Claim 1:

select said plurality of desired television channels from said digitized plurality of frequencies; and output said selected plurality of television channels to a demodulator as a digital datastream.

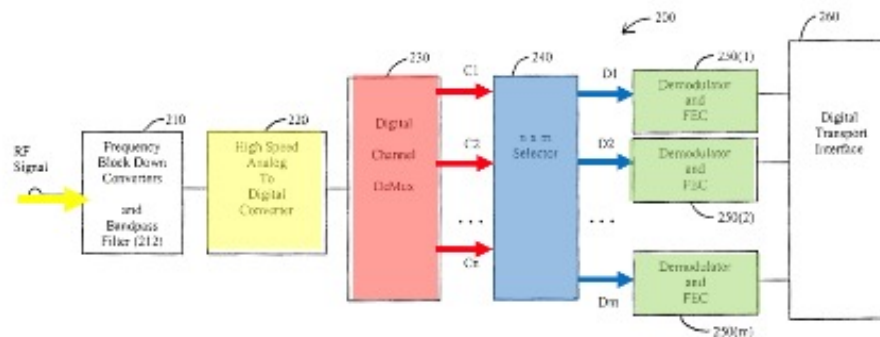


Fig. 2

Channels D_1 - D_m :

- i. No "Selection" Based On Petitioner's Construction
- ii. Not Selected "From Said Digitized Plurality Of Frequencies"

Petitioner: Selecting Requires “Extracting A Channel”

'362 Claim 1:

select said plurality of desired television channels from said digitized plurality of frequencies; and output said selected plurality of television channels to a demodulator as a digital datastream.

Petitioner's Construction Of “Select”:

Enterprises, Inc., 358 F.3d 870, 874-875 (Fed. Cir. 2004). Selection is simply extracting a channel from the plurality of frequencies in the digitized RF signal. This

IPR2024-00432 Reply, 24

Channels D_1 - D_m Are Not Extracted; Only Selected From Already Extracted Channels C_1 - C_n

Channels C_1 - C_n are extracted from the input signal

Channels D_1 - D_m are selected from already extracted channels C_1 - C_n

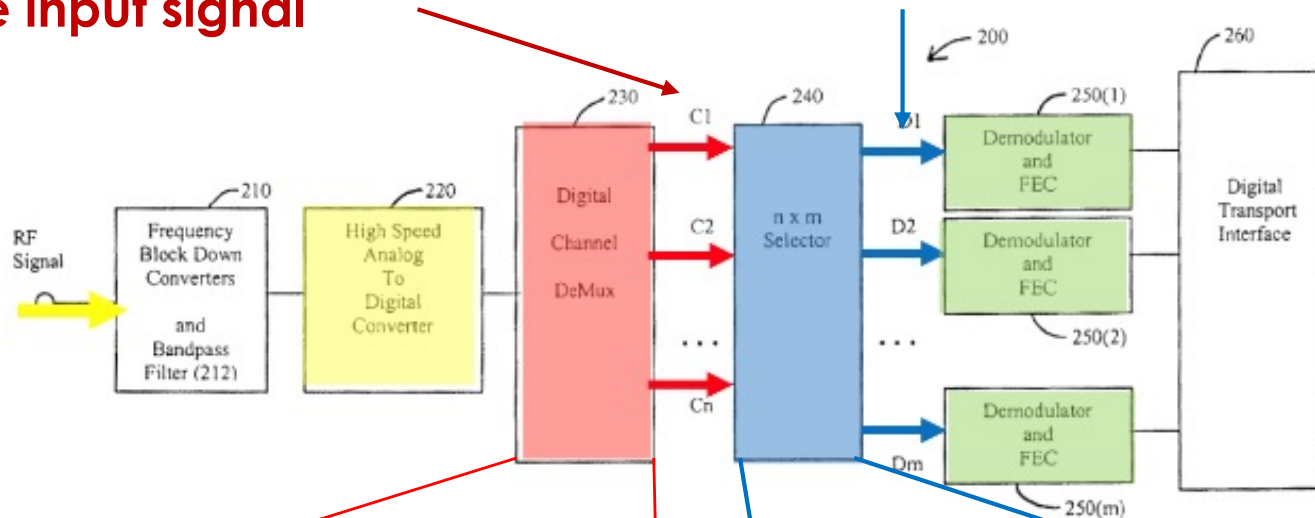


Fig. 2

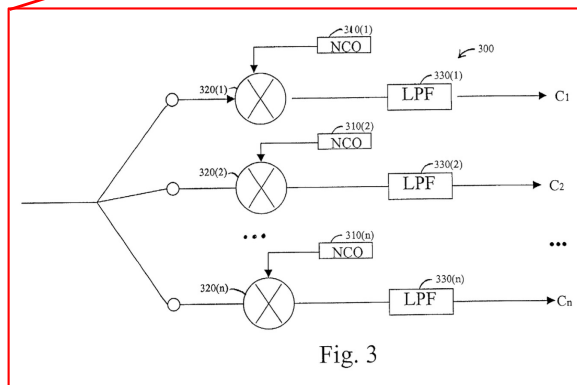


Fig. 3

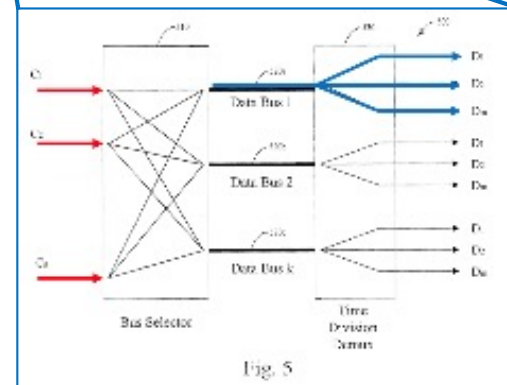


Fig. 5

Petitioner's Expert Agrees: Selector 240 (Which Outputs D_1 - D_m) Does Not Select Under Petitioner's Construction

DEPOSITION OF DAVID B. LETT

4 Q. So is it your testimony that
5 selector 240 performs no selections and all it is
6 described as doing is providing an output
7 potentially to a serial interface?
8 MR. CUVIELLO: Objection. Form.
9 THE WITNESS: So I would say that
10 box 240 does switching and -- and converting the
11 signal to the proper format for output, providing
12 those signals to the output.
13 BY MR. HENDIFAR:
14 Q. But that doesn't answer if it does
15 selection or not.
16 A. In the context that we've been talking
17 about selection, it does not. The selection is done
18 by box 230.

Ex. 2021 [Lett-2nd-Depo.] 82:4-18

Petitioner Fails To Meet Its Burden To Show Channels D_1 - D_m Disclose The Claims Under Its Own Construction Of “Select”



“Because [petitioner] has the burden of persuasion, [patent owner] has no obligation to precisely define the term gliding . . . away or explain how the term differs from the term flick in Robertson. 37 C.F.R. § 42.104(b)(3) (2020); 35 U.S.C. § 316(e).. ”

Google LLC v. Neonode Smartphone LLC, IPR2021-01041, Paper 52, 26 (Jan. 11, 2023)

“Patent Owner argues that **Petitioner has not shown how its proposed combination teaches** “receiving and processing events within a few milliseconds of the events occurring,” **as set forth in Petitioner’s proposed construction** of “real-time analysis engine.” ... We are persuaded by Patent Owner’s arguments. ”

DISH Network LLC v. Sound View Innovations LLC, IPR2020-01035, Paper 19, 13-14 (Jan. 19, 2021)

The Petition Fails As A Matter Of Law By Failing To Show The Claims Are Obvious Under Petitioner's Own Construction



'362 Claims: "Select ... Desired Television Channels From" The Same "Digitized Plurality Of Frequencies" Of Limitation 1[C]

US 9,210,362 B2

1. A wideband receiver system comprising:
- 1[B] a mixer module configured to downconvert a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels;
 - 1[C] a wideband analog-to-digital converter (ADC) module configured to digitize said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels;
 - 1[D] digital circuitry configured to:
 - select said plurality of desired television channels from
 - said digitized plurality of frequencies; and
 - output said selected plurality of television channels to a demodulator as a digital datastream.

Petitioner Maps The Input Of Zhang Demultiplexer 230 To Claimed “Digitized Plurality Of Frequencies” Of Limitation 1 [C]

US 9,210,362 B2

- [1B] 1. A wideband receiver system comprising:
a mixer module configured to downconvert a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels;
- [1C] a wideband analog-to-digital converter (ADC) module configured to digitize said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels;

Digitized “plurality of frequencies”
relied upon by Petition for 1 [C]

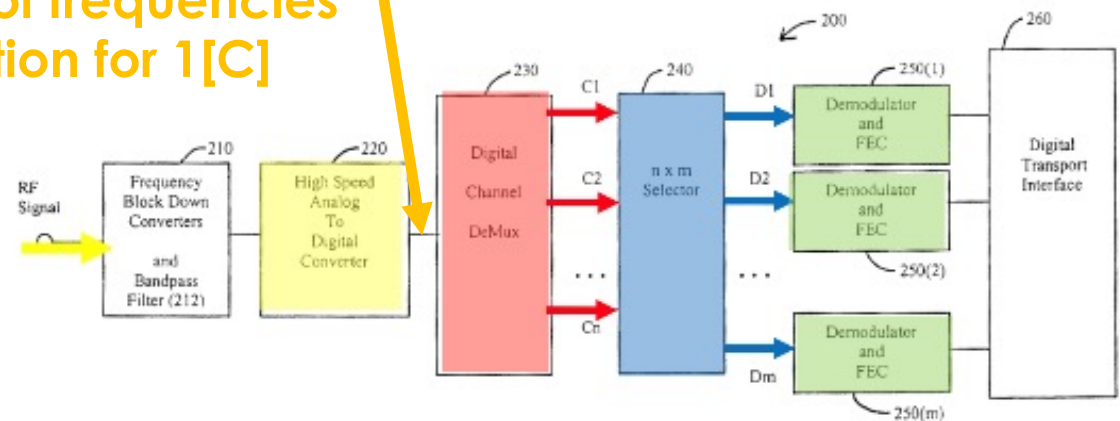


Fig. 2

Zhang Channels D_1 - D_m Are Selected From Channels C_1 - C_n , Not From The Input Of Demultiplexer 230

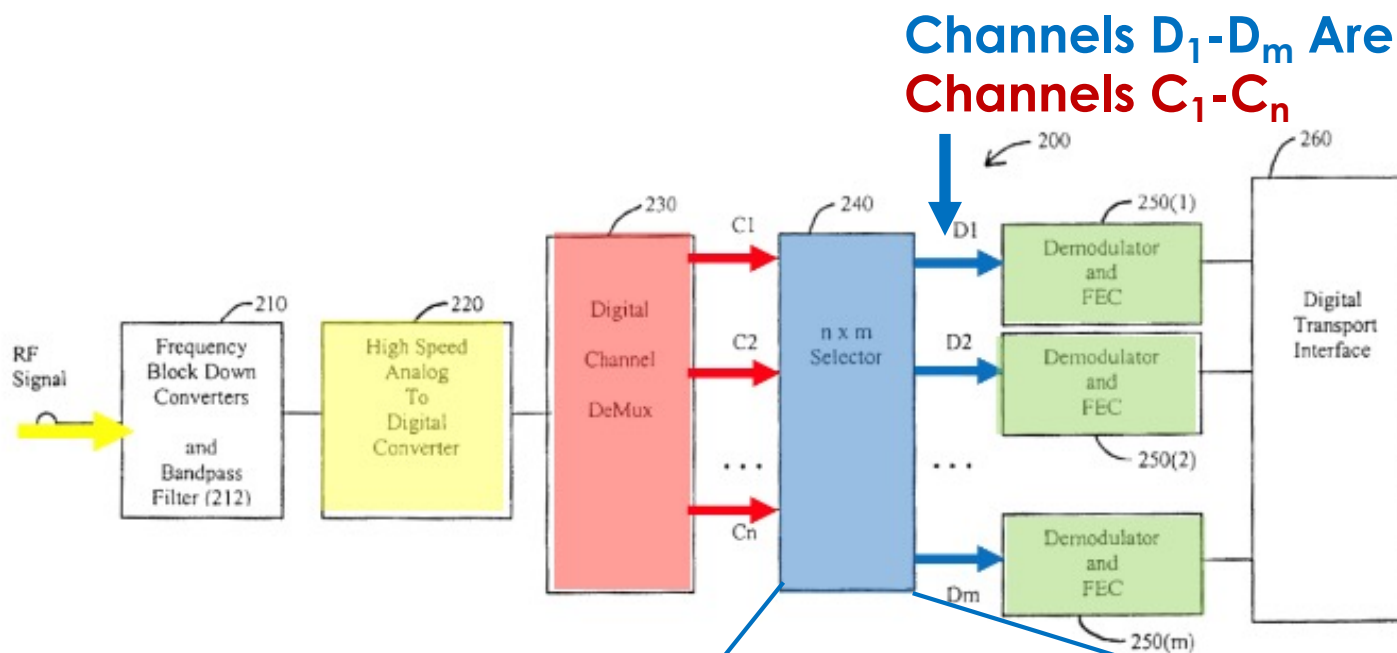
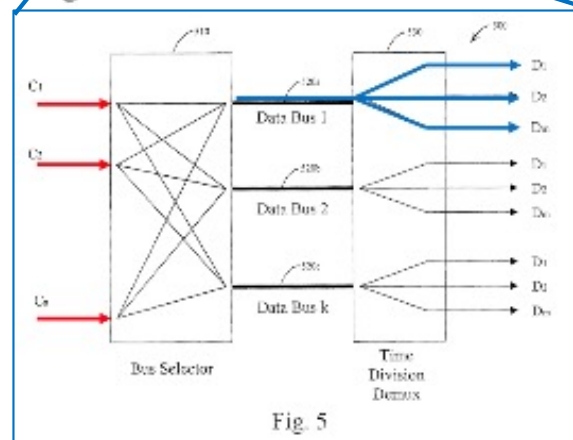


Fig. 2

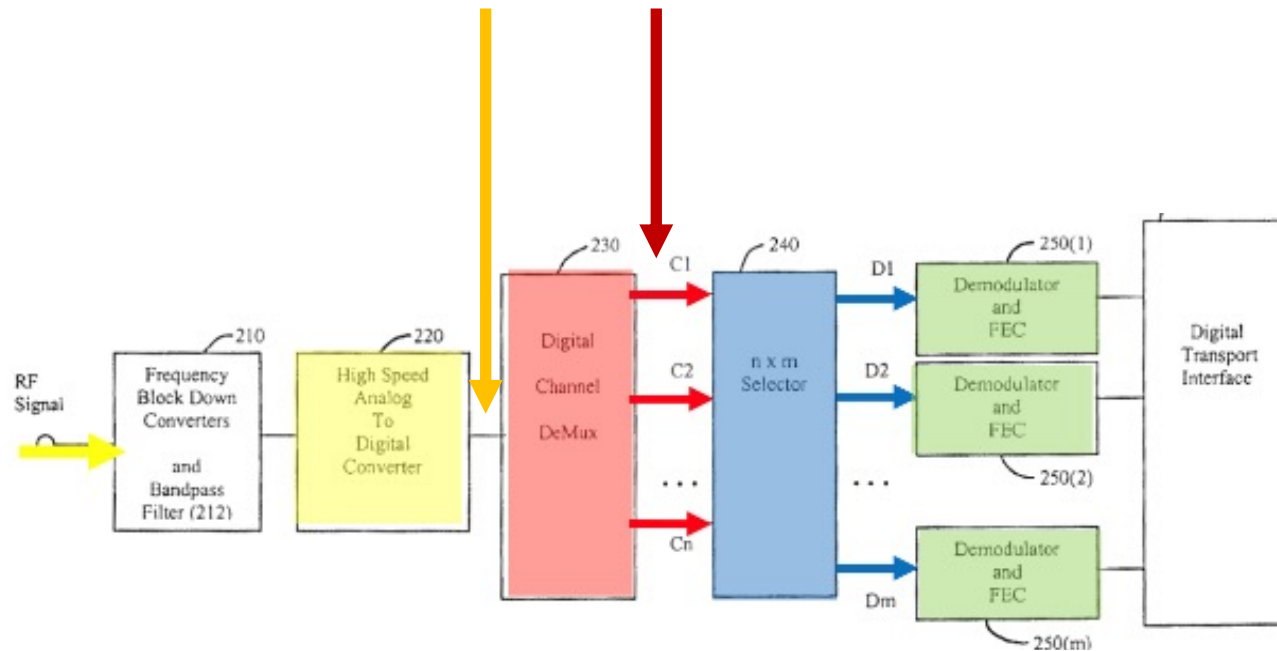


Channels D_1 - D_m Are Not Selected From The Same Plurality Of Frequencies Petitioner Maps For Limitation [1C]

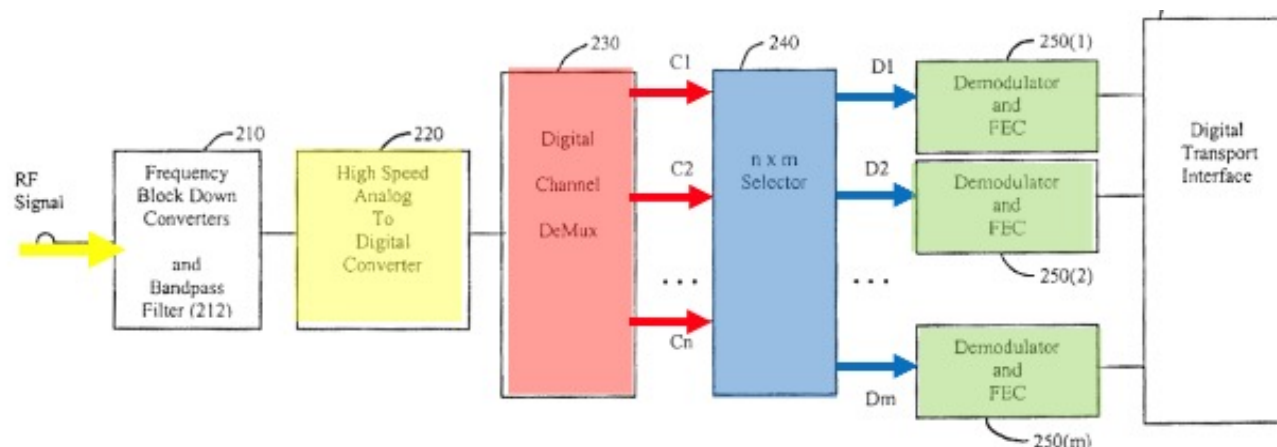
“plurality of frequencies”
mapped for limitation [1C]

≠

“plurality of frequencies” from which
channels D_1 - D_m are selected



Experts Agree: The “Plurality Of Frequencies” Input To Zhang’s Demultiplexer 230 Is Different From Output Channels C_1 - C_n



DECLARATION OF SAMUEL H. RUSS, PH.D.

75. Channels C_1 - C_n , from which channels D_1 - D_m are selected, are not the same “plurality of frequencies” digitized by Zhang in its analog-digital converter 220 (which, in Zhang’s implementation is the entire input). In Zhang, channels C_1 -

Ex. 2009 [Russ-Decl.] ¶ 75

REPLY DECLARATION OF DAVID B. LETT

demodulator to decode them. The “entire band” of frequencies that is present at the input is not present at the demultiplexer outputs. Ex. 1013, ¶ [0032].

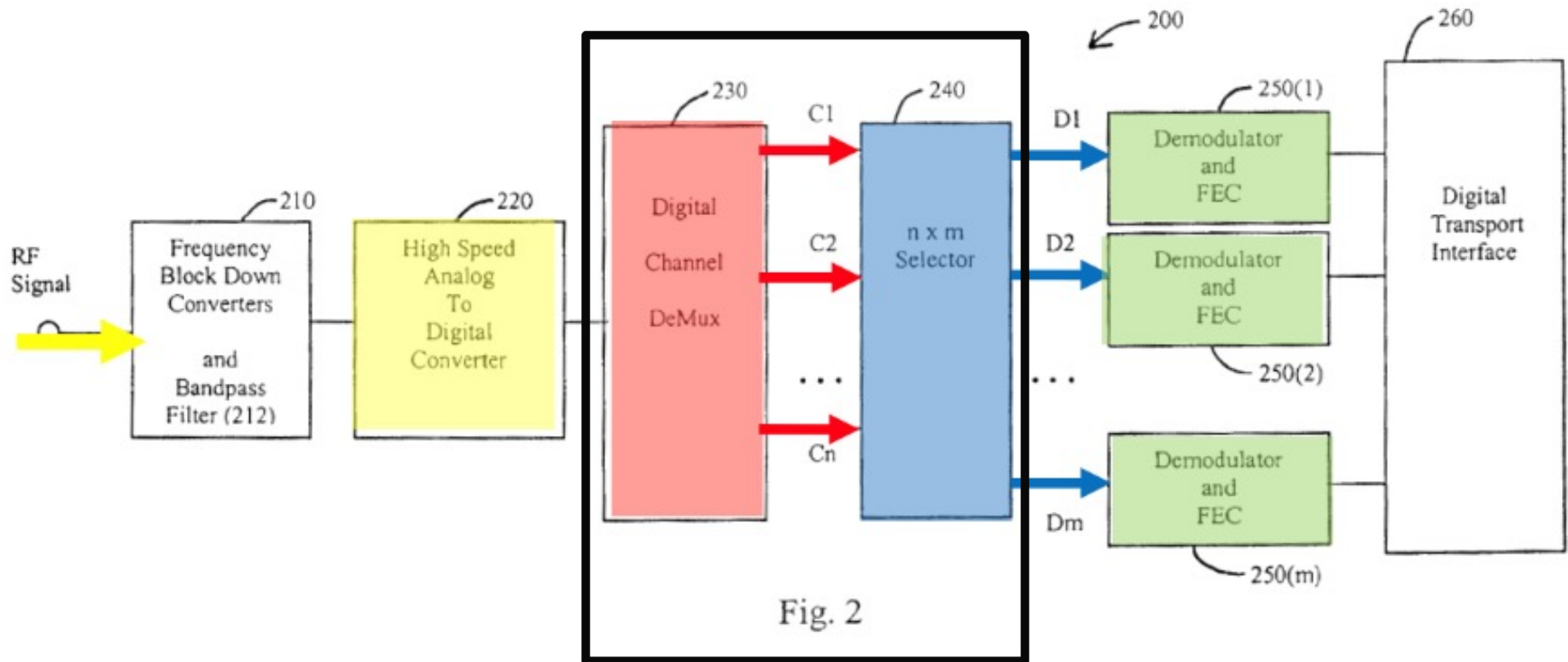
Ex. 1078 [Lett-2nd-Decl.] ¶ 28

Petitioner Fails To Show Zhang Channels D_1 - D_m Are Selected From The Same “Digitized Plurality Of Frequencies” As Limitation [1C]

US 9,210,362 B2

1. A wideband receiver system comprising:
- a mixer module configured to downconvert a plurality of frequencies that comprises a plurality of desired television channels and a plurality of undesired television channels;
 - [1C] a wideband analog-to-digital converter (ADC) module configured to digitize said plurality of frequencies comprising said plurality of desired television channels and said plurality of undesired television channels;
 - [1D] digital circuitry configured to:
 - select said plurality of desired television channels from ~~said~~ digitized plurality of frequencies; and
 - output said selected plurality of television channels to a demodulator as a digital datastream.
- 

Reply: Demultiplexer 230 + Selector 240 Together Select D_1 - D_m “From The Plurality Of Frequencies” Input To Demultiplexer 230



Alleged circuitry that selects D_1 - D_m from the input to Demultiplexer 230

Petitioner's Box Drawing Does Not Change The Architecture Of Zhang

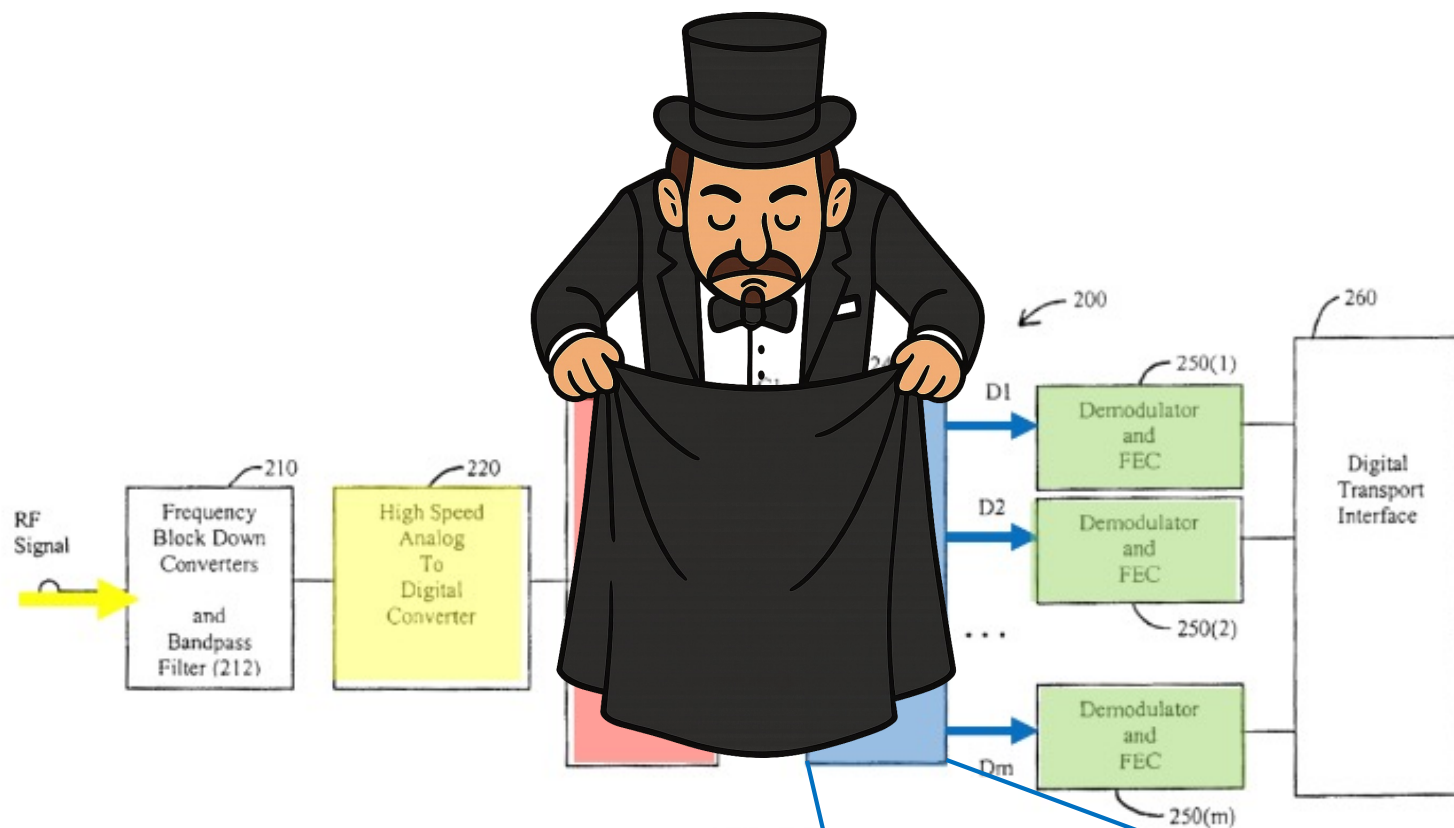
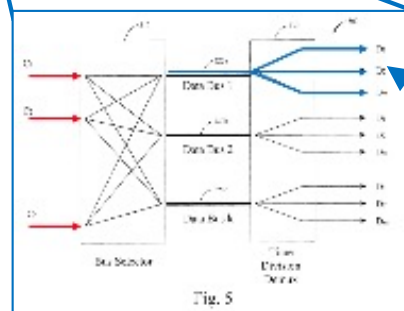


Fig. 2



Channels D_1 - D_m Are Still Selected From Channels C_1 - C_n

Petitioner Incorrectly Asserts That The Output Of A Blackbox Is Necessarily Selected From The Input Of The Blackbox

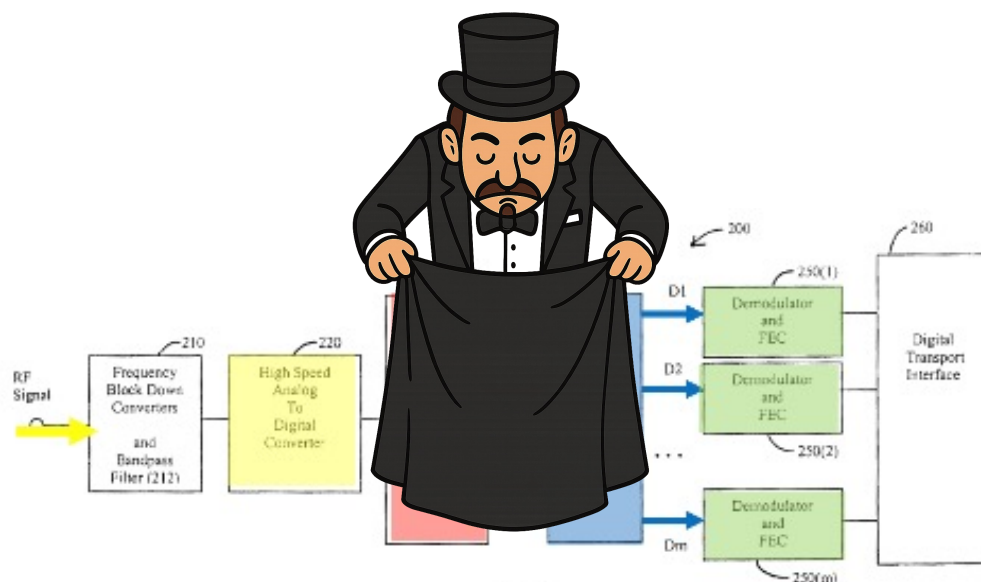


Fig. 2

PETITIONER'S REPLY

channel RF signal are ‘undesired.’”). Ex. 1078, ¶ 5. Thus, the input to the relied-upon digital circuitry (i.e., the input to demultiplexer 230) is the digitized plurality of frequencies output by the ADCs, *not* the individual channels C_1 - C_n . And, the output of the relied-upon digital circuitry is D_1 - D_m , which are the desired channels.

It necessarily follows that the relied-upon digital circuitry is selecting the desired channels (D_1 - D_m) “from the digitized plurality of frequencies.”

Why?

IPR2024-00432 Reply, 8

Petitioner's Argument Renders Superfluous The Claims' Separate Recitation Of "Output" In Addition To "Select"



'362 Patent Claim 1:

~~select~~ said plurality of desired television channels from said digitized plurality of frequencies; and output said selected plurality of television channels to a demodulator as a digital datastream.

Claim Differentiation: '866 Claims (Same Specification) Recite “Select” But Not “From Said Digitize Plurality Of Frequencies”

'362 Patent Limitation 1[d] and 11[d]	'866 Patent Limitation 1[b]
Limitation 1[d] : “select said plurality of desired television channels from said digitized plurality of frequencies” Limitation 11[d]: “selecting, by digital circuitry of said wideband receiver system, said plurality of desired television channels from said digitized plurality of frequencies”	“a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.”

Merely Similar Results (e.g., Output Of Desired Channels) Does Not Disclose The Claims



“A process patent, however, claims not a structural entity, ‘but rather an operation or series of steps leading to a useful result.’ 1 *Chisum on Patents* § 1.03, at 1-58 (2000). Thus, **the very details regarding how such “useful result” has come about are at the heart of a process patent**, whereas the process by which a patented product is obtained is ordinarily irrelevant to a product patent.”

Amgen, Inc. v. Hoechst Marion Roussel, 126 F. Supp. 2d 69, 101 (D. Mass. 2001) aff’d in relevant part, 314 F.3d 1313, 1346-1347 (Fed. Cir. 2003)

Petitioner Presents A Misleading Annotation Of Zhang To Suggest Demultiplexer 230 (Left) Selects Two Channels

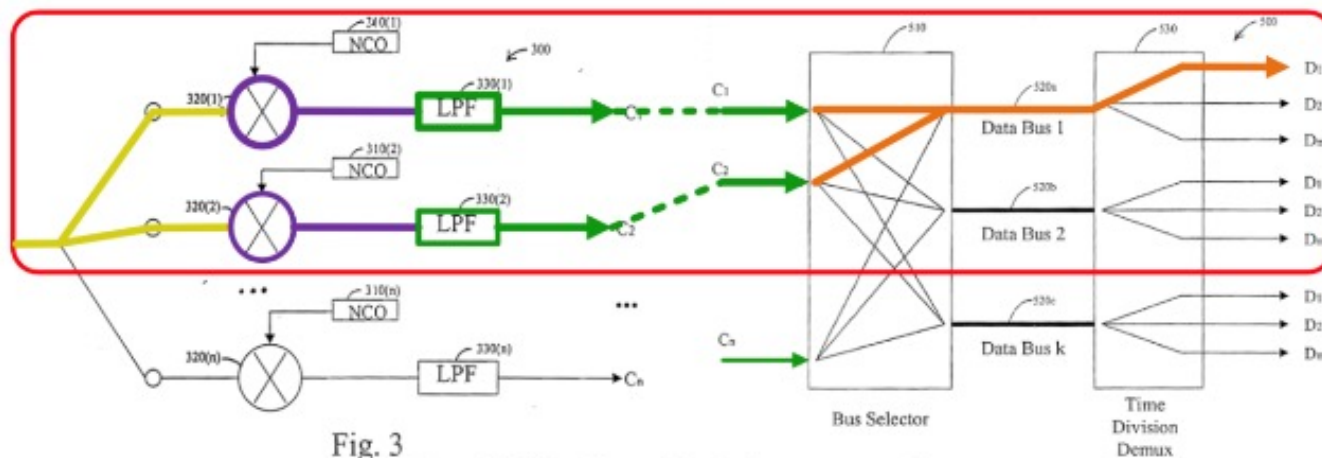
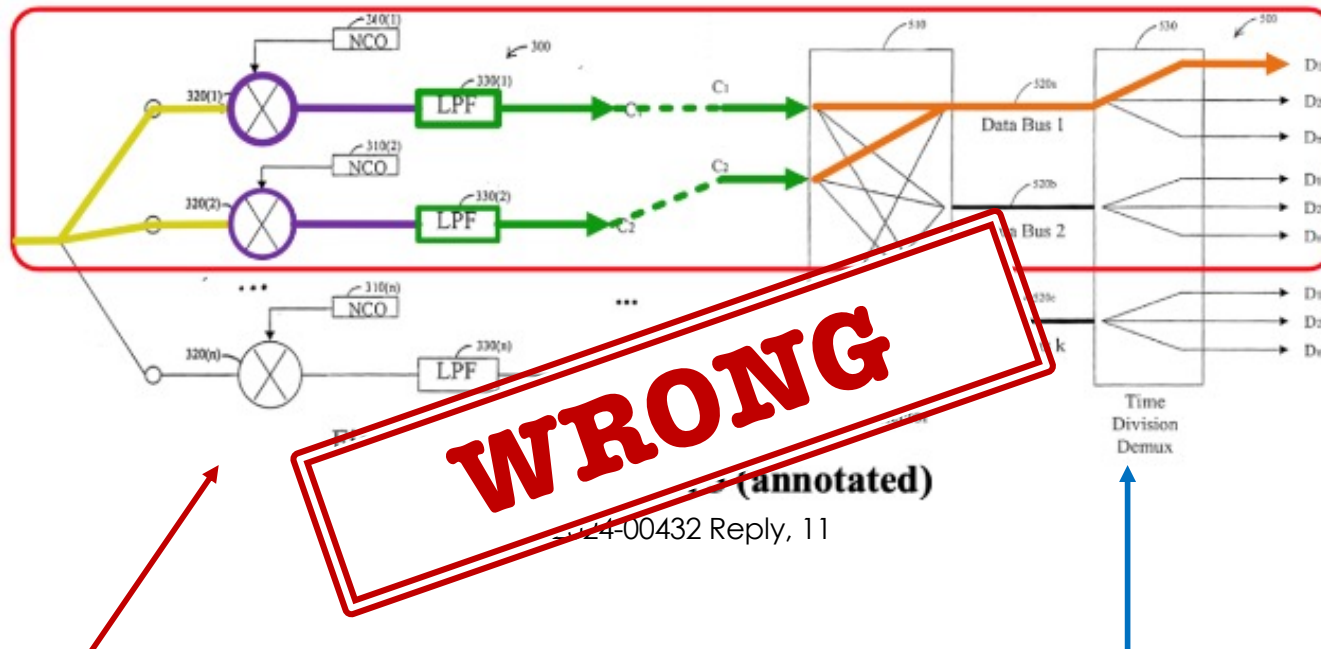


Fig. 3

Ex. 1013, Figs. 3, 5 (annotated)

IPR2024-00432 Reply, 11

Petitioner's Annotation Of Zhang Is Misleading



Correct Explanation:

Demultiplexer 230 does not select any two channels but indiscriminately demultiplexes all channels C_1 - C_n .

Correct Explanation:

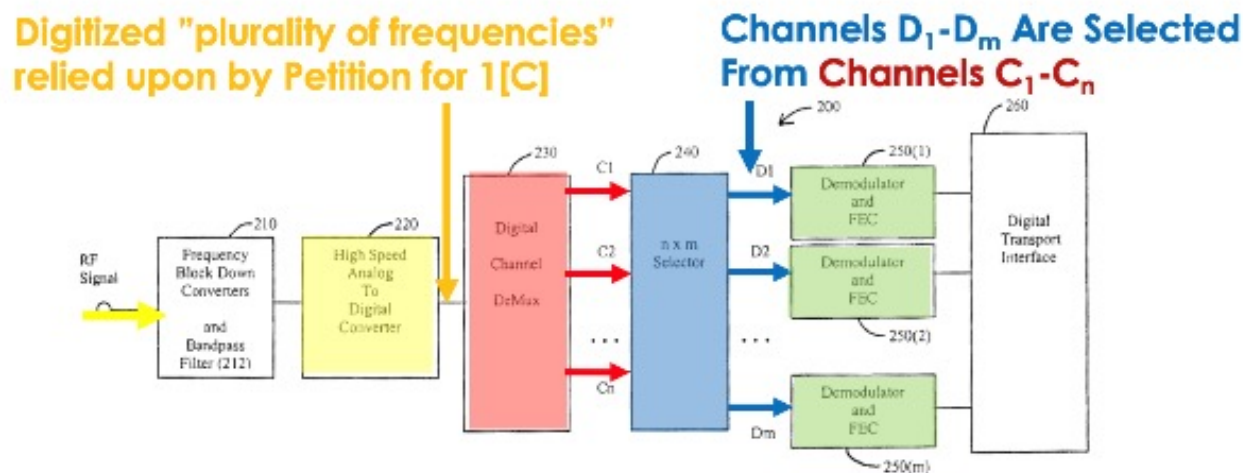
Selector 240 Subsequently Selects Desired Channels D_1 - D_m From Demultiplexed Channels C_1 - C_n

Summary: Zhang Channels D_1 - D_m Are Not “Select[ed]” “From Said Digitized Plurality Of Frequencies”

D_1 - D_m Are Not “Selected” Under Petitioner’s Construction

- **Petitioner’s Construction:** “Selection is simply extracting a channel from the plurality of frequencies in the digitized RF signal”
IPR2024-00432 Reply, 24
- **Not Extracted:** D_1 - D_m are not extracted; only selected from already extracted C_1 - C_n
IPR2024-00432 Sur-Reply, 20-22
- **Petitioner’s Expert Agrees:** Selector 240 does not select under his construction
Ex. 2021 [Lett-2nd-Depo-Volume-II] 82:4-18

D_1 - D_m Are Not Selected “From Said Digitized Plurality Of Frequencies” Of 1[C]



Petitioner Fails To Show Independent Claims:

IPR2024-00432 (9,210,362)

1, 11	" select said plurality of desired television channels from said digitized plurality of frequencies "
-------	--

IPR2024-00435 (11,381,866)

14, 41, 69	[14C] " each digital down converter ... is operable to generate a digital channel output corresponding to each desired channel " [14D] "to provide each digital channel output via a serial interface "
------------	---

1, 27, 55	" DFE is configured to concurrently select and provide each of the plurality of desired channels without providing any of the plurality of undesired channels"
-----------	--

IPR2024-00438 (11,399,206)

1, 25, 51	" selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels"
-----------	---

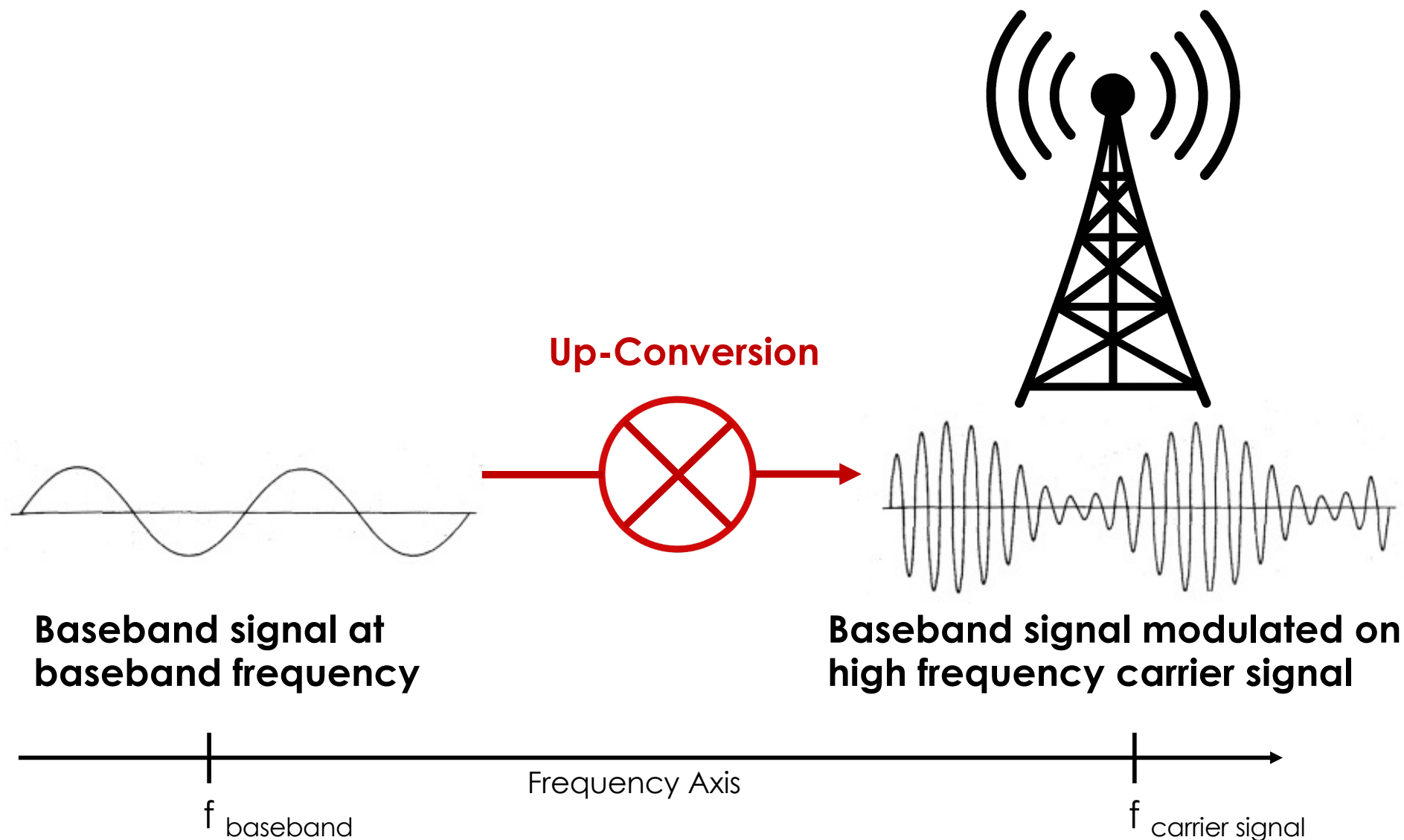
13, 38, 64	[13D] " digitally down converting each desired channel , of the plurality of desired channels, to generate a plurality of digital channel outputs ; [13E] providing the plurality of digital channel outputs via a serial interface "
------------	---

'866 Claims 14, 41, 69: “Each Digital Downconverter” To “Generate A Digital Channel Output Corresponding To Each Desired Channel”

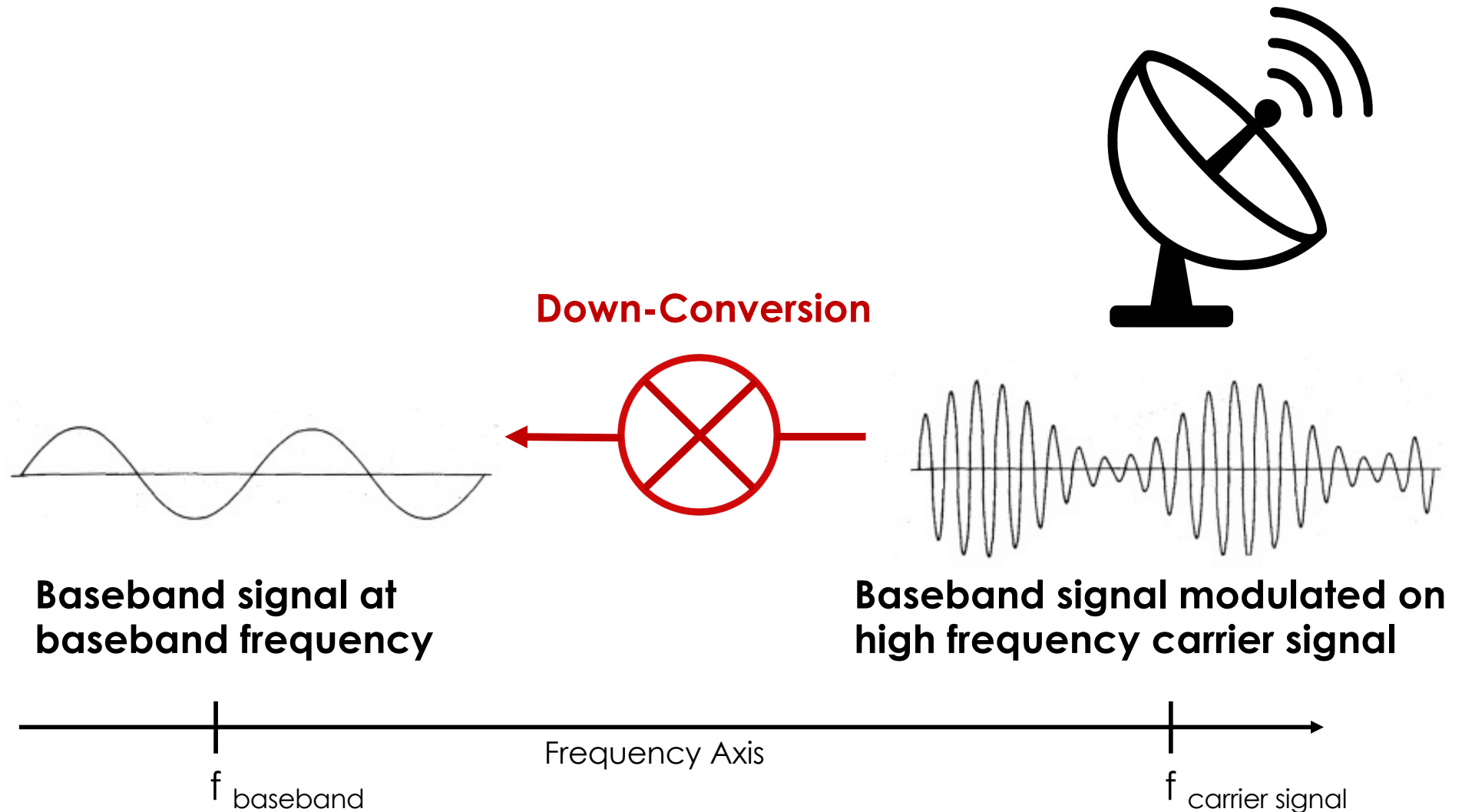
US 11,381,866 B2

14. A cable TV device comprising:
a wideband analog-to-digital converter (ADC) configured to digitize an input signal, wherein the input signal comprises a plurality of desired channels and a plurality of undesired channels; and
a plurality of digital down converters coupled to the wideband ADC, wherein each digital down converter, of the plurality of digital down converters, is operable to generate a digital channel output corresponding to each desired channel, of the plurality of desired channels, and wherein the plurality of digital down converters is operable to provide each digital channel output via a serial interface.

Up-Conversion: Baseband Signal Containing Information Is Modulated On High Frequency Carrier Signal For Transmission

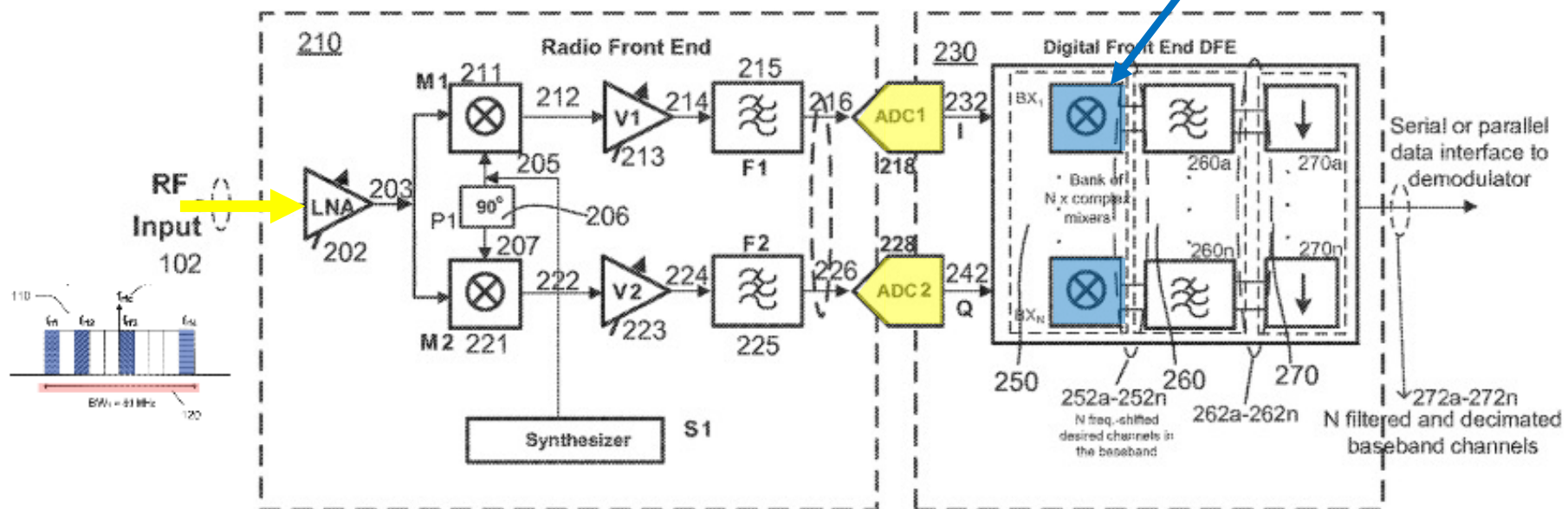


Down-Conversion: A Receiver Down-Converts The Received Signal From Carrier Frequency To Baseband Frequency



'866 Patent: Each Downconverter Downconverts One Of Desired Channels

N mixers select and down-convert N desired channels without selecting or downconverting any undesired channels



Petitioner Relies On Zhang Multipliers 320(1)-(n) In Demultiplexer 230 As The “Plurality Of Downconverters”

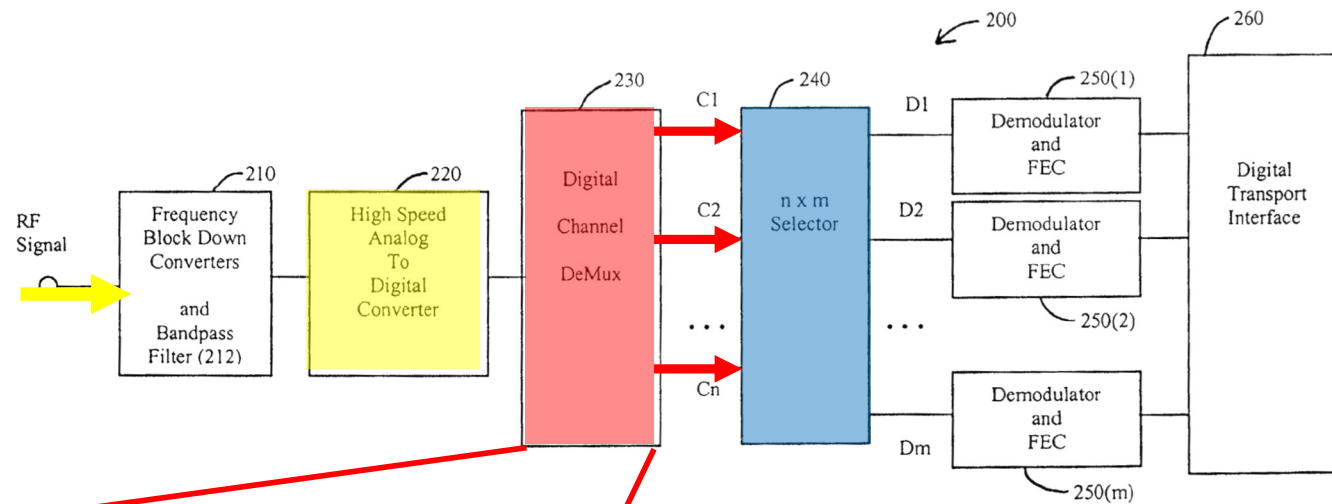


Fig. 2

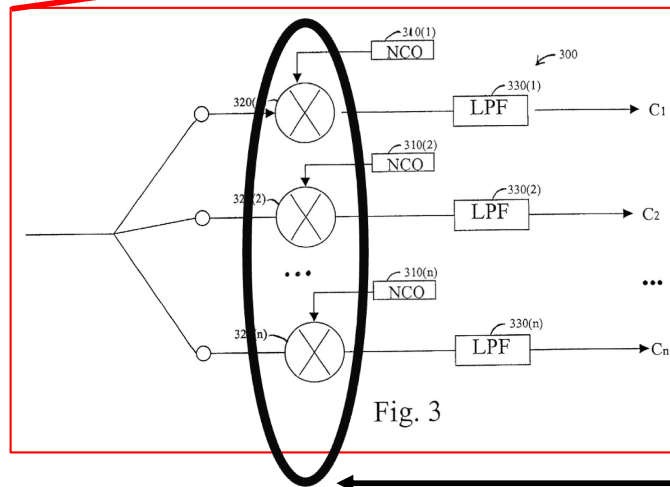


Fig. 3

Petitioner relies on multipliers 320(1)-(n) in Demultiplexer 230 as the claimed “plurality of downconverters”

Zhang: Each Of Multipliers 320(1)-(n) Downconverts One Of Channels C_1 - C_n

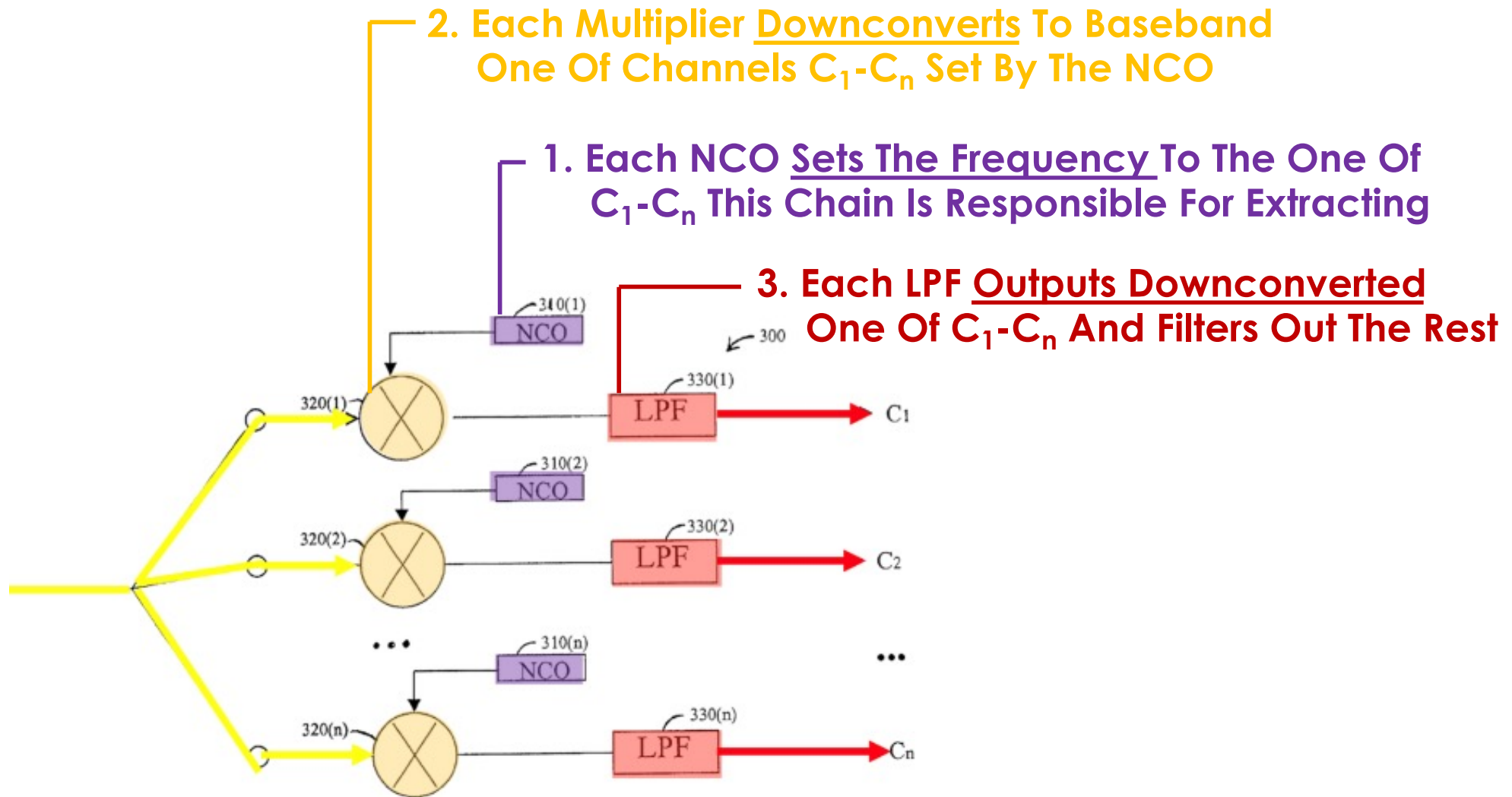


Fig. 3

Zhang Channels C_1 - C_n Are All Channels In The Entire Signal Band, Not “Desired Channels”

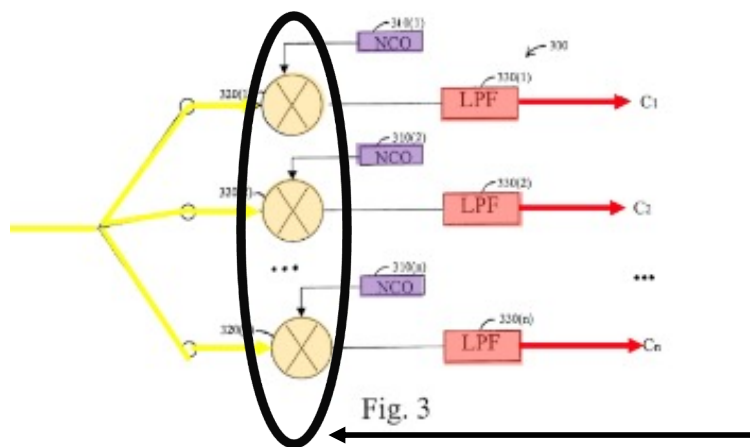
- Zhang Defines n :** C_1 - C_n are all channels “in the entire signal band.”
 Ex. 1013 [Zhang] [0027]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 78:14-22
- Architecture:** A selector subsequently selects desired channels D_1 - D_m .
 Ex. 1013 [Zhang] [0028], [0039], [0042]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 7:6-10
- Design Goal:** By design extracts all channels C_1 - C_n to permit quick selection.
 Ex. 1013 [Zhang] [0028]; Ex. 2019 [Lett-1st-Depo-Volume-II] 8:4-8
- EU Prosecution:** Confirms channels C_1 - C_n are “all of the RF channels.”
 Ex. 2012 [Zhang-EPO-Reply] 2-3



“Each” Of Zhang Multipliers 320(1)-(n) Do Not Generate An Output Corresponding To “Each Desired Channel”

US 11,381,866 B2

a plurality of digital down converters coupled to the wideband ADC, wherein each digital down converter, of the plurality of digital down converters, is operable to generate a digital channel output corresponding to each desired channel, of the plurality of desired channels, and wherein the plurality of digital down converters is operable to provide each digital channel output via a serial interface.



Only some of Zhang multipliers 320(1)-(n) generate an output that may in retrospect happen to correspond to a subsequently selected desired channel

Zhang C₁-C_n As “generate[d] ... output” Contradicts Mapping For “Provide Each Digital Channel Output Via A Serial Interface”

US 11,381,866 B2

14. A cable TV device comprising:

a wideband analog-to-digital converter (ADC) configured to digitize an input signal, wherein the input signal comprises a plurality of desired channels and a plurality of undesired channels; and

a plurality of digital down converters coupled to the wideband ADC, wherein each digital down converter, of the plurality of digital down converters, is operable to generate a digital channel output corresponding to each desired channel, of the plurality of desired channels, and wherein the plurality of digital down converters is operable to provide each digital channel output via a serial interface.

Petitioner Relies On Zhang Data Bus 1 In Its Figure 5 As Transmitting Digital Channel Outputs Via A Serial Interface

US 11,381,866 B2

a plurality of digital down converters coupled to the wideband ADC, wherein each digital down converter, of the plurality of digital down converters, is operable to generate a digital channel output corresponding to each desired channel, of the plurality of desired channels, and wherein the plurality of digital down converters is operable to provide each digital channel output via a serial interface.

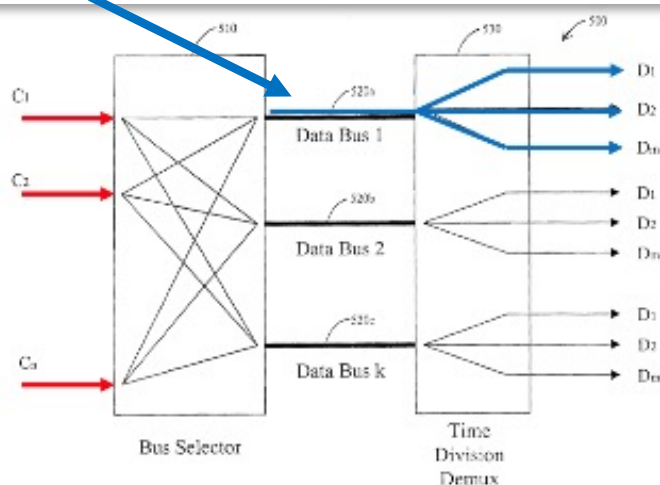
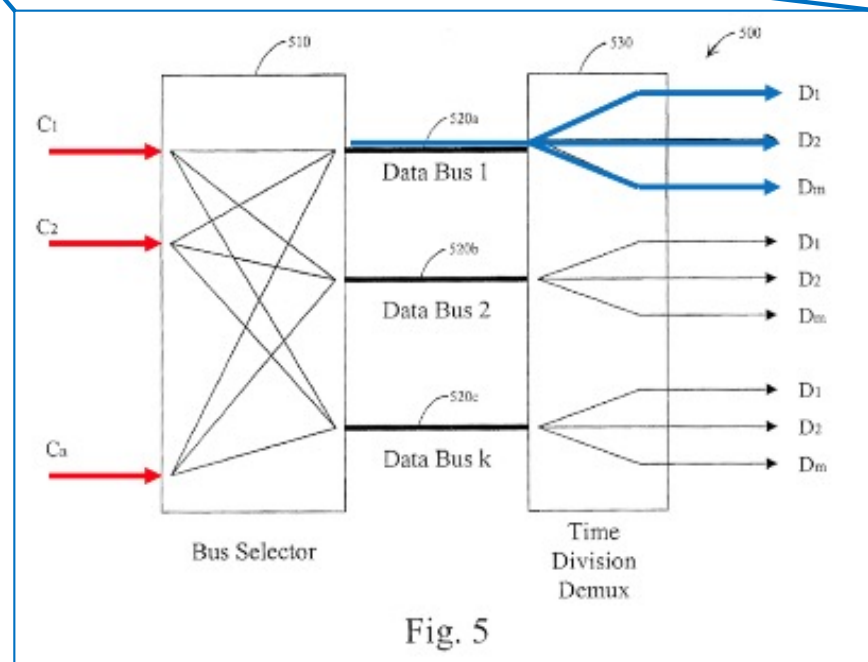
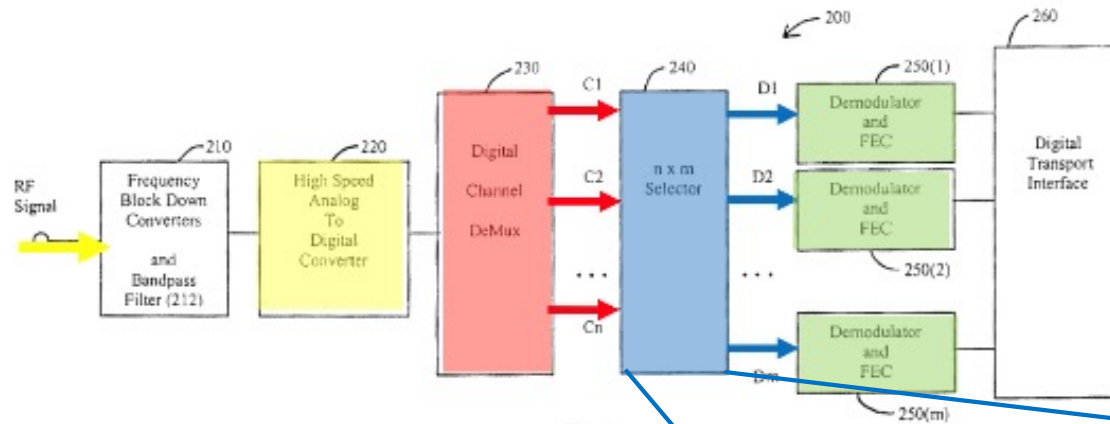
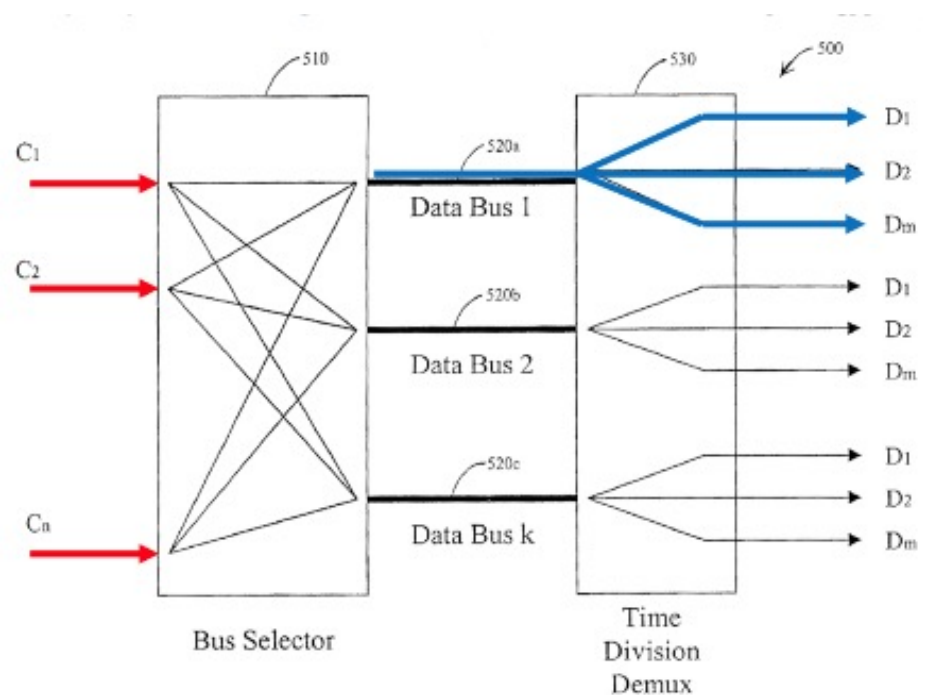


Fig. 5

Zhang Figure 5 Implements Its Selector 240 That Selects Channels D_1 - D_m From All Channels C_1 - C_n



What Is Output On A Serial Interface In Zhang Figure 5 Is Channels D_1 - D_m , Not Channels C_1 - C_n



Weimin Zhang,

Fig. 5

[0039] In operation, digital selector **500** digitally selects one or more RF channels D_1 to D_m from the digital RF channels C_1 to C_n and then sends them to appropriate demodulators or output ports (not shown) through different data buses (not shown). Because a bus clock is much faster

Petitioner Misapprehends Patent Owner's Argument (Claim 14) As Requiring No Outputs Corresponding To Undesired Channels

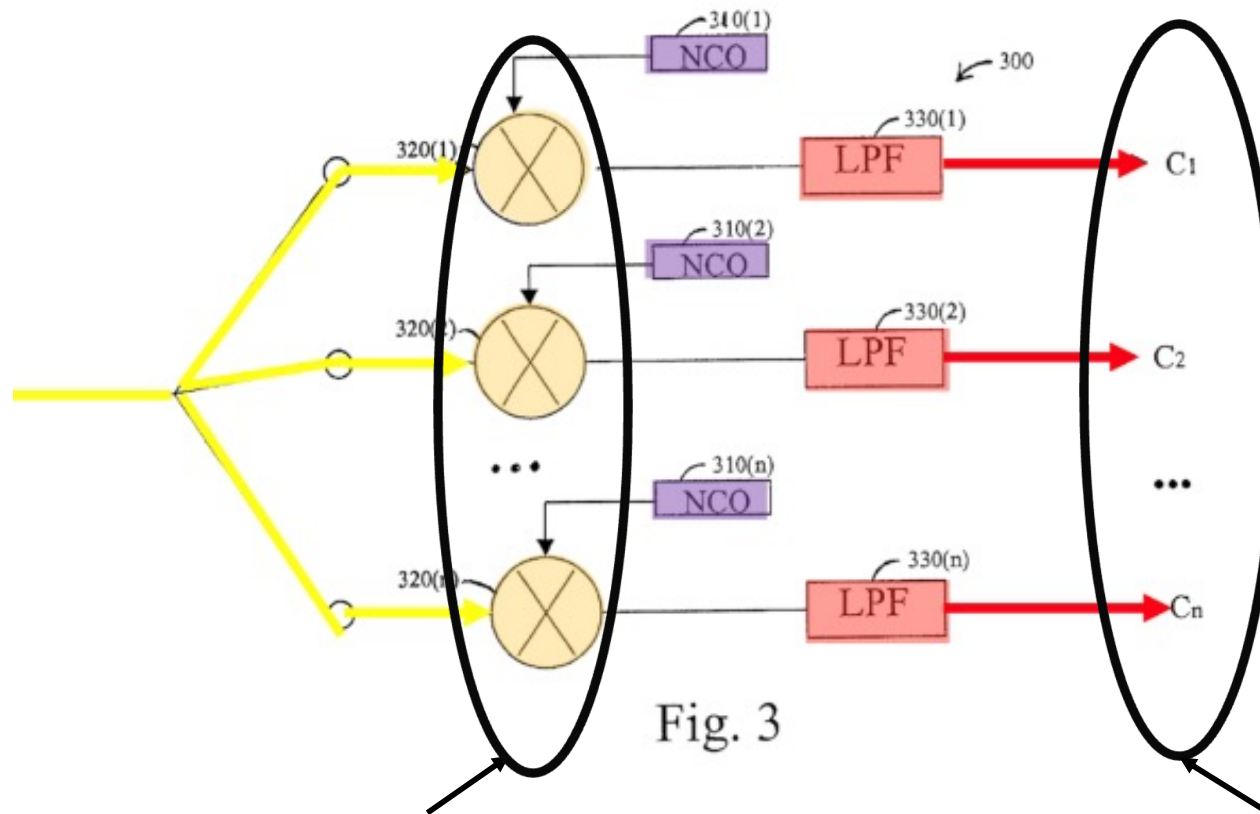
PETITIONER'S REPLY

not to be *provided*. Element [1C] places no requirement on *selecting* undesired channels and Element [14C] places no requirement regarding undesired channels in any respect. Ex. 1078, ¶ 20. PO's argument that "not selecting any undesired channels" and "not generating digital channel outputs corresponding to undesired channels" should be written into the claims is incorrect.

IPR2024-00435 Reply, 15

“Each” Of Plurality Of Down Converters Relied Upon By Petitioner Do Not Correspond To “Each Desired Channel”

Weimin Zhang,



“plurality of down converters”
relied upon by Petitioner

All channels C_1 - C_n “in the
entire signal band”

Petitioner Fails To Show Independent Claims:

IPR2024-00432 (9,210,362)

1, 11	" select said plurality of desired television channels from said digitized plurality of frequencies "
-------	--

IPR2024-00435 (11,381,866)

14, 41, 69	[14C] " each digital down converter ... is operable to generate a digital channel output corresponding to each desired channel " [14D] "to provide each digital channel output via a serial interface "
------------	---

1, 27, 55	" DFE is configured to concurrently select and provide each of the plurality of desired channels without providing any of the plurality of undesired channels"
-----------	--

IPR2024-00438 (11,399,206)

1, 25, 51	" selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels"
-----------	---

13, 38, 64	[13D] " digitally down converting each desired channel , of the plurality of desired channels, to generate a plurality of digital channel outputs ; [13E] providing the plurality of digital channel outputs via a serial interface "
------------	---

Petitioner Fails To Show Claims 1, 27, 55 For Three Independently Sufficient Reasons

US 11,381,866 B2

a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

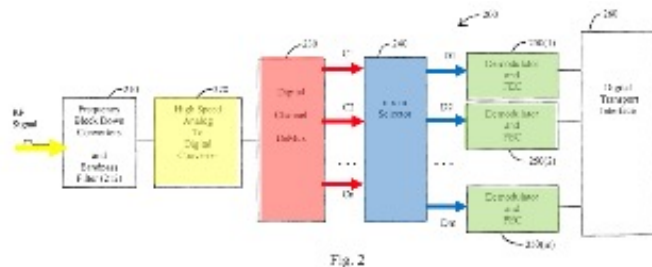
Petitioner Fails To Show:

1. “Select ... each of the plurality of desired channels”
2. “A DFE ... to ... provide each of the plurality of desired channel”
3. “Concurrently” under Petitioner’s expert’s understanding of the limitation

Petitioner Relies On Zhang Channels C_1 - C_n And Demultiplexer 230 To “Select ... Each Of The Plurality Of Desired Channels”

'866 Pat. Cl. 1:

a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.



PETITION:

Digital tuner 300 (an embodiment of demultiplexer 230) (below left) has the same structure as the '866 patent's digital front end 230 (below right), including multiple signal paths for concurrently selecting and providing a plurality of desired channels C_1 - C_n (light blue). Compare Ex. 1013, Fig. 3 (filters 330), [0030]-[0034],

Pet., 23

REPLY:

The Petition explained how Zhang's demultiplexer 230 receives a digitized version of the multi-Channel RF signal from ADC 220 and selects from this signal a number “n” of desired channels C_1 - C_n (green), each at a unique “target” RF

Reply, 8

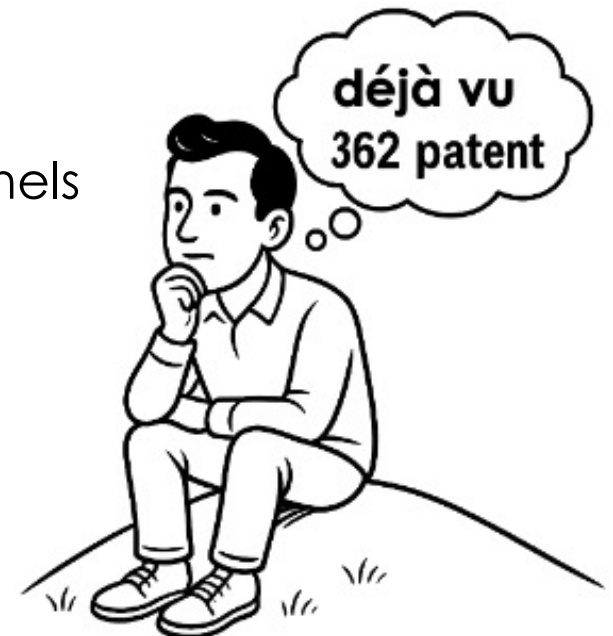
Zhang Channels C_1 - C_n Are Not “Desired Channels” And Are Not “Selected”

C_1 - C_n Are All Channels, Not “Desired Channels”

- **Zhang Defines n:** C_1 - C_n are all channels “in the entire signal band.”
Ex. 1013 [Zhang] [0027]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 78:14-22
- **Architecture:** A selector subsequently selects desired channels D_1 - D_m .
Ex. 1013 [Zhang] [0028], [0039], [0042]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 7:6-10
- **Design Goal:** By design extracts all channels C_1 - C_n to permit quick selection.
Ex. 1013 [Zhang] [0028]; Ex. 2019 [Lett-1st-Depo.-Volume-II] 8:4-8
- **EU Prosecution:** Confirms channels C_1 - C_n are “all of the RF channels.”
Ex. 2012 [Zhang-EPO-Reply] 2-3

C_1 - C_n Are Not Selected

- **Not selected:** indiscriminately demultiplexes all channels without selection
Ex. 1013 [Zhang] [0028]; Abstract.
- **Petitioner’s Construction:** select $\neq$ indiscriminate demultiplexing of all channels
Ex. 2021 [Lett-2nd-Depo.] 49:13-25; IPR2024-00432 Sur-Reply, 17-18



Petitioner Relies On Zhang Selector 240 For Claimed “Provide Each Of The Plurality Of Desired Channels”

'866 Cl. 1:

a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

PETITION:

Selector 240 further provides the desired channels “via a serial interface” as recited in Element [1C]. Selector 240, implemented as illustrated in Figure 5, includes a bus selector 510 and one or more multiple data buses 520. Ex. 1013,

Pet., 24

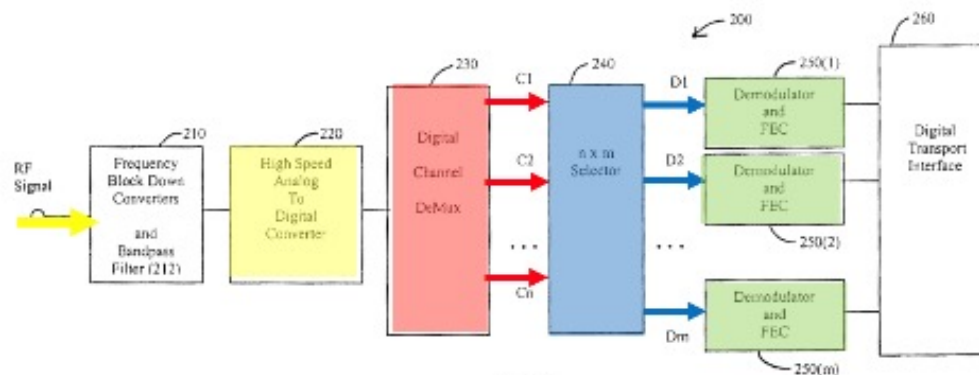


Fig. 2

Petitioner Fails To Show Zhang Selector 240 Is A Part Of The Claimed “Digital Frontend (DFE)”

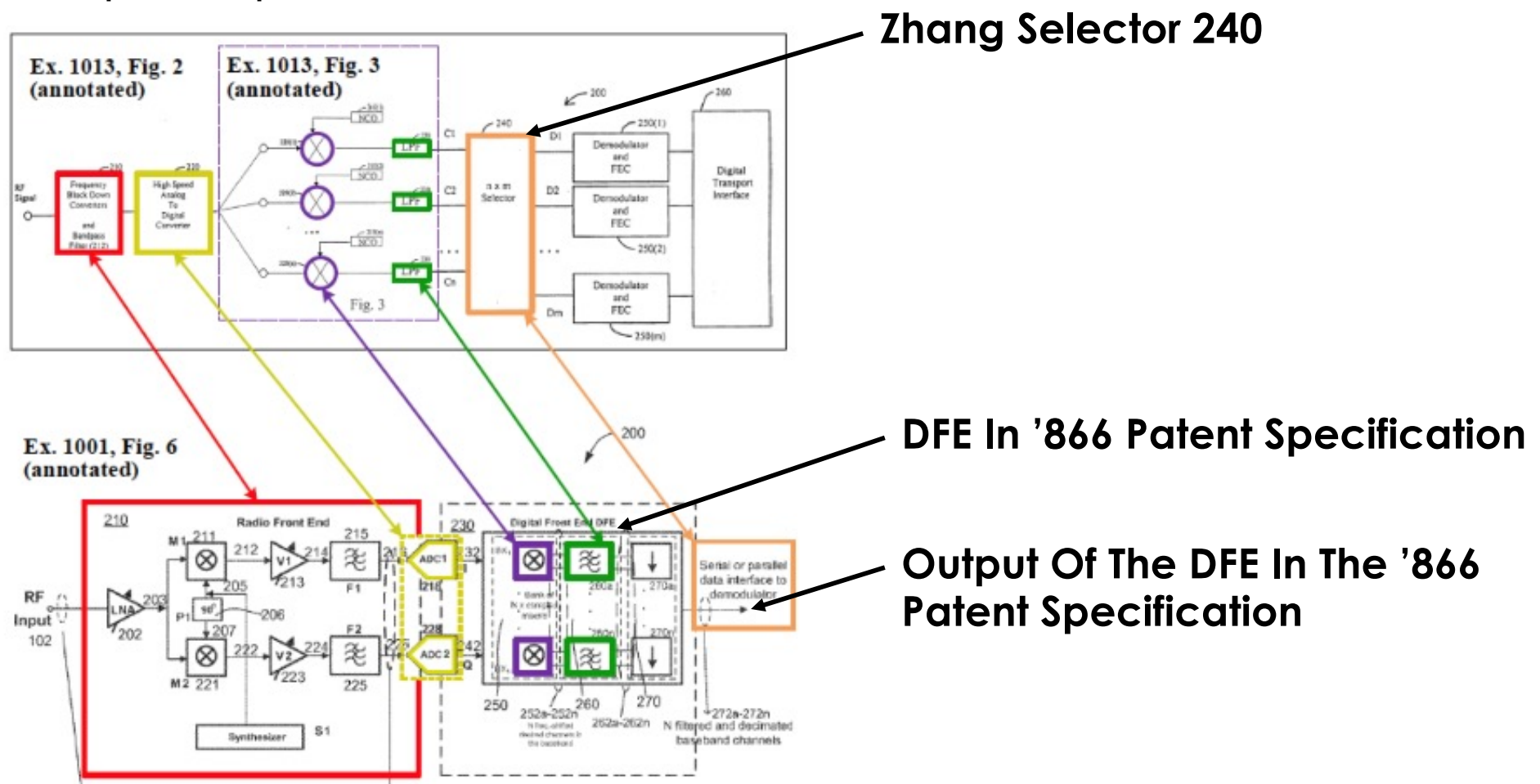
'866 Cl. 1:

a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

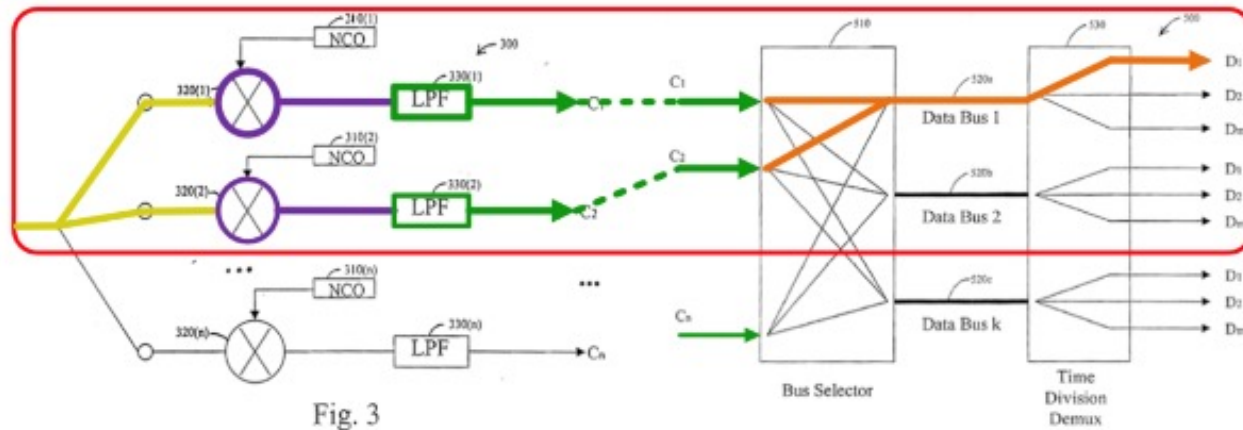
Petitioner's Expert: Zhang Selector 240 Corresponds To The Output Of The Patent's DFE, Not To The DFE

Mapping By Petitioner's Expert

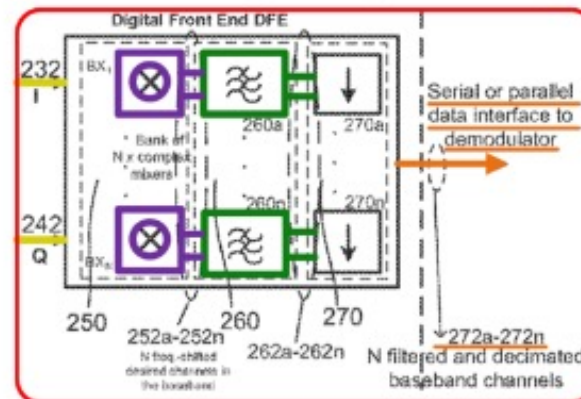
Ex. 1002 [Lett-1st-Decl.] ¶ 79



Reply Similarly Maps Zhang Selector 240 To The Output Of The Patent's DFE (Color Orange In Petitioner's Annotation Below)



Ex. 1013, Figs. 3, 5 (annotated)



Reply, 21

Petitioner: Zhang Demultiplexer 230, Not Selector 240, “Has The Same Structure As The '866 Patent's Digital Front End”

PETITION

Digital tuner 300 (an embodiment of demultiplexer 230) (below left) has the same structure as the '866 patent's digital front end 230 (below right), including multiple signal paths for concurrently selecting and providing a plurality of desired channels C_1 - C_n (light blue). Compare Ex. 1013, Fig. 3 (filters 330), [0030]-[0034], claims 34, 36-37 with Ex. 1001, Fig. 2 (filters 260), 6:3-8; Ex. 1002, ¶ 110. Like the '866 patent's DFE, each path includes a complex multiplier 320 (purple) followed by a low pass filter (LPF) 330 (green).

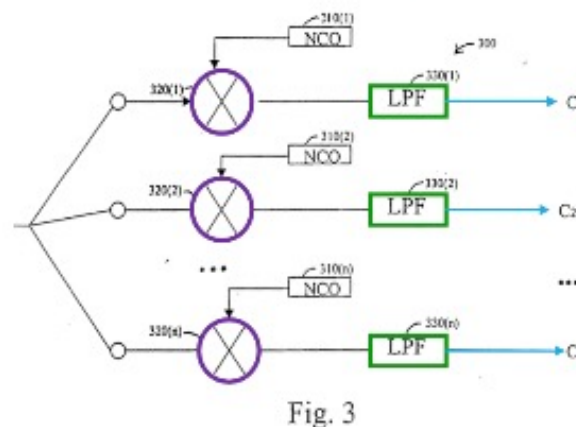
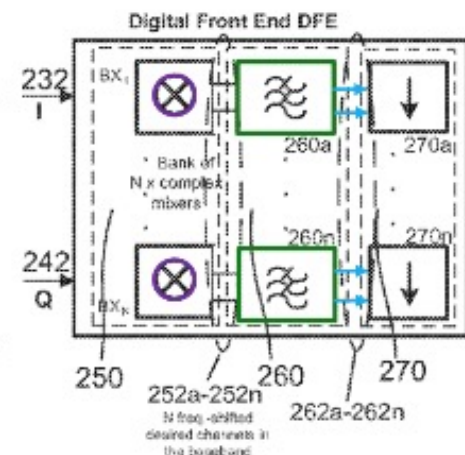


Fig. 3

Ex. 1013, Fig. 3 (annotated)



Ex. 1001, Fig. 2 (annotated)

Pet., 23

Petitioner's Expert At Deposition Repeatedly Defended Mapping Zhang Selector 240 To The Output Of The Patent's DFE

DEPOSITION OF DAVID B. LETT

16 Q Now, why did you map in purple the $n \times m$
 17 selector 240 in Zhang to the output of the Digital
 18 Front End DFE arrow titled serial or parallel to
 19 demodulator in Figure 6 of the '866 patent?

20 A Because the $n \times m$ selector outputs serial
 21 or parallel interface to a demodulator.

Ex. 2018 [Lett-1st-Depo.-Volume-I] 145:16-21

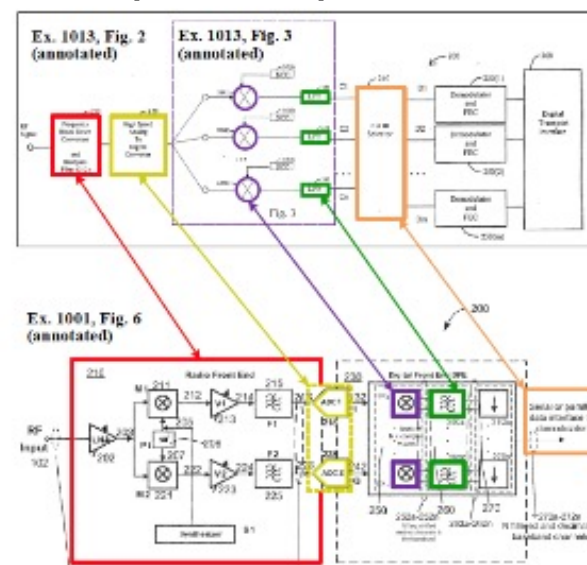
4 Q So in your opinion, would it be wrong to
 5 map the $n \times m$ selector 240 from Zhang to the output
 6 of filters 260 within the digital front end in
 7 Figure 6 of the '866 patent?

8 A Well, the output of the Figure 6
 9 annotated below is on the right side. And what
 10 we're mapping to is the output to demodulators.
 11 So it is more logical to map that to the output.
 12 And then we come along later and explain the
 13 decimation.

Ex. 2018 [Lett-1st-Depo.-Volume-I] 147:4-13

Mapping By Petitioner's Expert

Ex. 1002 [Lett-1st-Decl.] ¶ 79



Petitioner's Expert: Merely Being "Digital" Is Not Sufficient To Be Part Of The DFE, Depends On Specific Context And Product

DEPOSITION OF DAVID B. LETT

13 Q. Is anything that has some digital
14 circuitry in it considered digital front end?

15 A. I don't think so. I mean I think you'd
16 have to be more specific than that.

Ex. 2021 [Lett-2nd-Depo.] 108:13-16

24 Q. Now, Mr. Lett, is the term "digital
25 front end" a term of art that a POSITA would know
1 what it means in general in this field?

2 MR. CUVIELLO: Objection. Form.

3 THE WITNESS: Well, I think one would
4 need to put it in the context of the type of product
5 we're talking about to get a general idea.

6 So, digital front end in one type of
7 product may be totally different than another. But

Ex. 2021 [Lett-2nd-Depo.] 107:24-108:7

Petitioner Fails To Meet Its Burden To Show What The Claimed Digital Front End Is And Why Zhang Selector 240 Is A Part Of It



“In an *inter partes* review, the **burden of persuasion is on the petitioner** to prove unpatentability by a preponderance of the evidence, 35 U.S.C. § 316(e), and **that burden never shifts to the patentee.**”



In re Magnum Oil Tools Int'l, Ltd., 829 F.3d 1364, 1375 (Fed. Cir. 2016)

Reply For The First Time Relies On Combinations Of Zhang With Secondary References To Disclose The Claimed DFE

PETITIONER'S REPLY

Moreover, in addition to Zhang alone, the Petition explained how Zhang in view of the applicant's admitted prior art (AAPA), the knowledge of a POSITA, and Pandey teach the claimed "DFE configured to concurrently select and provide ... via a serial interface." Petition, 24-27, 32-33, 73-78. To the extent Zhang alone does not teach a DFE, the POR does not dispute that any of these combinations teach the claimed DFE.

IPR2024-00435 Reply, 22

The Petition Only Relied On AAPA, Knowledge Of POSITA And Pandey For Disclosure Of A “Serial Interface,” Not DFE

PETITION

To the extent Zhang does not disclose a serial interface, implementing Zhang’s circuitry to output the selected channels via a serial interface was obvious in light of the POSITA’s general knowledge, creativity, and common sense as one of two common design choices that were well-known in integrated circuits at the

Pet., 26-27

As discussed above, Zhang discloses the serial interface of claims 1, 14, 36, 50, 64, and 78 (and claims 3-7, 9-13, 16-20, and 22-26, which depend from claim 1 or 14), and the claimed “parallel interface” of claims 35, 49, 63, and 77. *See* Sections VII.A.1-2, VII.A.5-10, VII.B.4-8. While Zhang teaches these serial and parallel interfaces, so does Pandey. Ex. 1002, ¶ 252.

Pet., 72

Petitioner Does Not Provide Any Analysis Why Its Newly Relied Upon Combinations Disclose The Claimed DFE



Petitioner Fails To Show “Concurrently” Under Its Expert’s Understanding Of The Claim Limitation

'866 Cl. 1:

a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

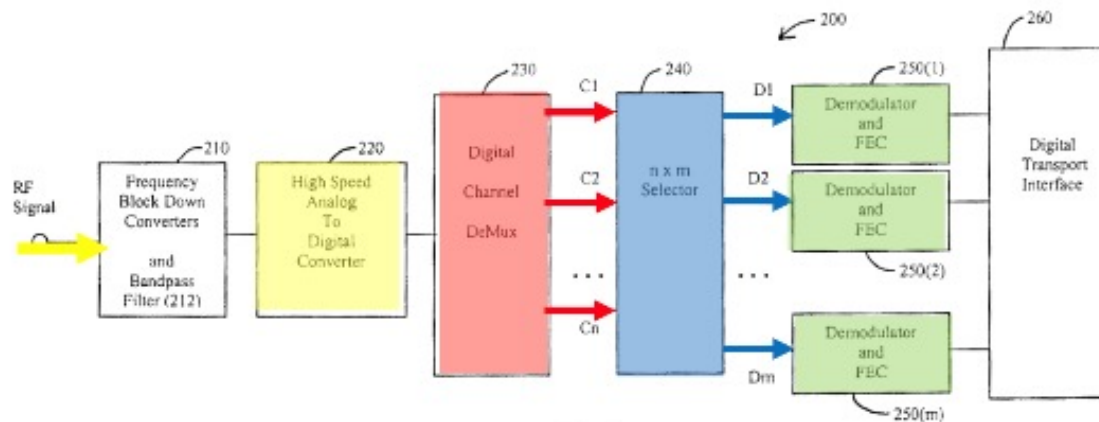


Fig. 2

Petitioner's Expert: The Acts Of "Selecting" And "Providing" Must Be Concurrent

DEPOSITION OF DAVID B. LETT

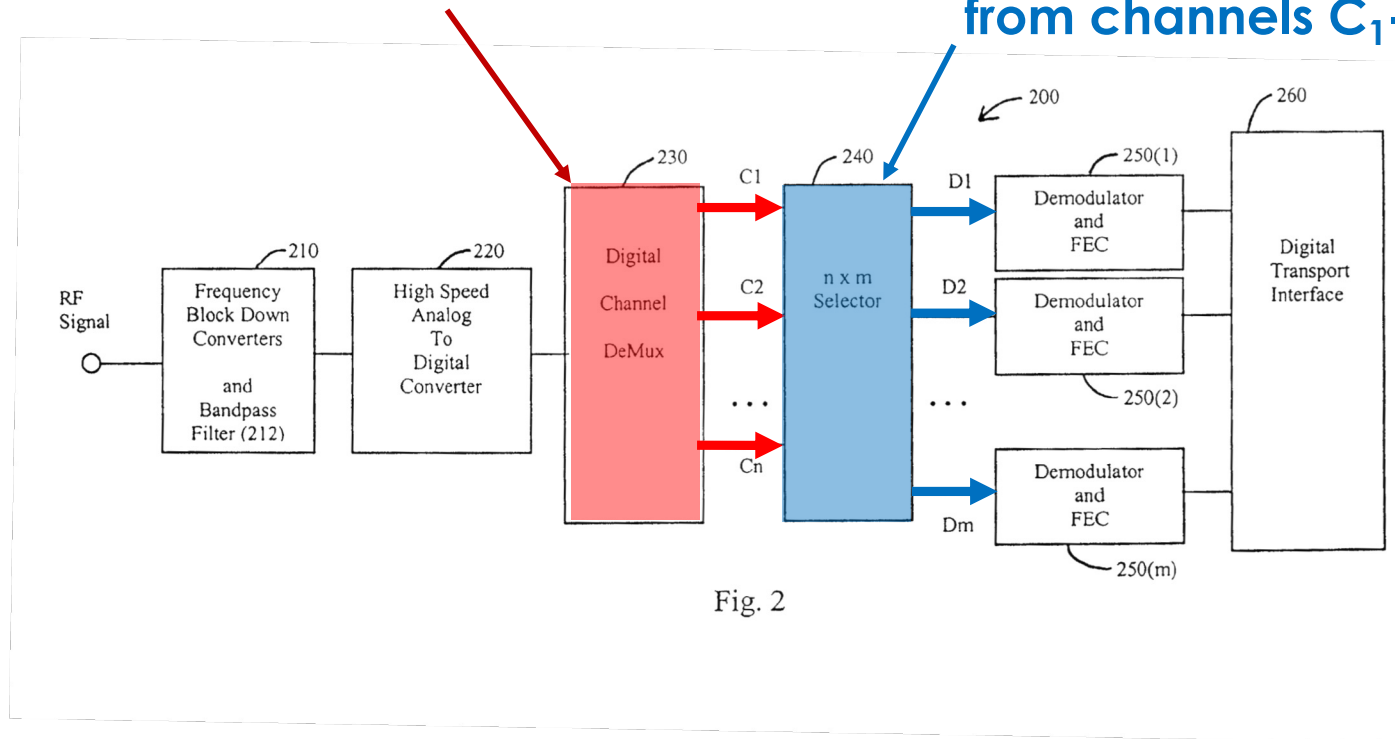
25 Q So in your opinion, do the acts of selecting
1 and providing have to happen concurrently in claim 27?
2 A It seems to. Again, I'm not an attorney.
3 Maybe there's some other meaning that I don't
4 understand, but it seems to me that they both have to
5 occur.

Ex. 2019 [Lett-1st-Depo-Volume-II] 76:25-77:5

Zhang Demultiplexer 230 (Putative “Select”) And Selector 240 (Putative “Provide”) Operate Sequentially, Not Concurrently

1. Channels C_1 - C_n are extracted

2. Channels D_1 - D_m are selected from channels C_1 - C_n



Petitioner Fails To Show Independent Claims:

IPR2024-00432 (9,210,362)

1, 11	" select said plurality of desired television channels from said digitized plurality of frequencies "
-------	--

IPR2024-00435 (11,381,866)

14, 41, 69	[14C] " each digital down converter ... is operable to generate a digital channel output corresponding to each desired channel " [14D] "to provide each digital channel output via a serial interface "
------------	---

1, 27, 55	" DFE is configured to concurrently select and provide each of the plurality of desired channels without providing any of the plurality of undesired channels"
-----------	--

IPR2024-00438 (11,399,206)

1, 25, 51	" selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels"
-----------	---

13, 38, 64	[13D] " digitally down converting each desired channel , of the plurality of desired channels, to generate a plurality of digital channel outputs ; [13E] providing the plurality of digital channel outputs via a serial interface "
------------	---

'206 Claims 1, 25, 51: "Select" "Desired Channels" "From The Input Signal"

US 11,399,206

1. A method for receiving a television (TV) signal comprising:
receiving an input signal from a cable network;
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;
concurrently selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels; and
providing the plurality of desired channels via a serial interface.

Petitioner Alternatively Relies On Zhang Channels C_1 - C_n And D_1 - D_m As The Claimed “Desired Channels”

'206 Patent Claim 1:

- [1D] concurrently selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels; and
- [1E] providing the plurality of desired channels via a serial interface.

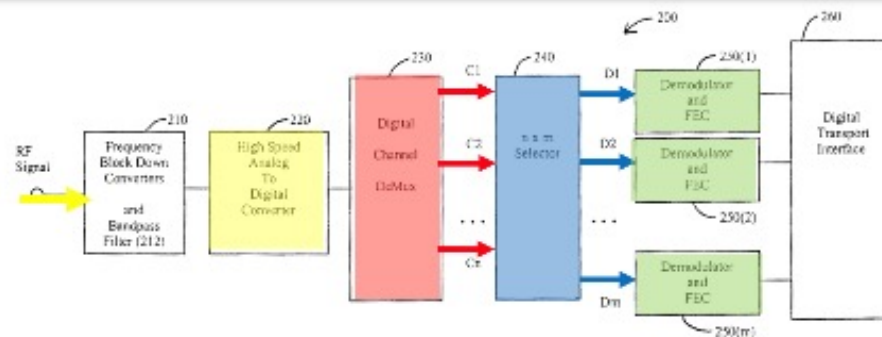


Fig. 2

Channels C_1 - C_n :

- i. Not “Desired Channels”;
 - ii. Not “Selected”;
 - iii. Not Same Channels
- “Output” In Limitation 1[E]

Channels D_1 - D_m :

- i. No “Selection” Based On Petitioner’s Construction
- ii. Not Selected “From The Input Signal”

Zhang Channels C_1 - C_n Are Not “Desired Channels” Or “Selected” For Same Reasons As Discussed For '362 Patent

C_1 - C_n Are All Channels, Not “Desired Channels”

- **Zhang Defines n:** C_1 - C_n are all channels “in the entire signal band.”
Ex. 1013 [Zhang] [0027]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 78:14-22
- **Architecture:** A selector subsequently selects desired channels D_1 - D_m .
Ex. 1013 [Zhang] [0028], [0039], [0042]; Ex. 2018 [Lett-1st-Depo.-Volume-I] 7:6-10
- **Design Goal:** By design extracts all channels C_1 - C_n to permit quick selection.
Ex. 1013 [Zhang] [0028]; Ex. 2019 [Lett-1st-Depo.-Volume-II] 8:4-8
- **EU Prosecution:** Confirms channels C_1 - C_n are “all of the RF channels.”
Ex. 2012 [Zhang-EPO-Reply] 2-3

C_1 - C_n Are Not Selected

- **Not selected:** indiscriminately demultiplexes all channels without selection
Ex. 1013 [Zhang] [0028]; Abstract.

C_1 - C_n Cannot Satisfy Limitation 1 [E]:

- **Inconsistent Mapping:** C_1 - C_n for [1D] are not the same “plurality of television channels” output to demodulators in [1E]
IPR2024-00438 POR, 24-26, Sur-Reply, 11-12



Petitioner Alternatively Relies On Zhang Channels D_1 - D_m As The Claimed “Desired Channels”

'206 Patent Claim 1:

- [1D] concurrently selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels; and
- [1E] providing the plurality of desired channels via a serial interface.

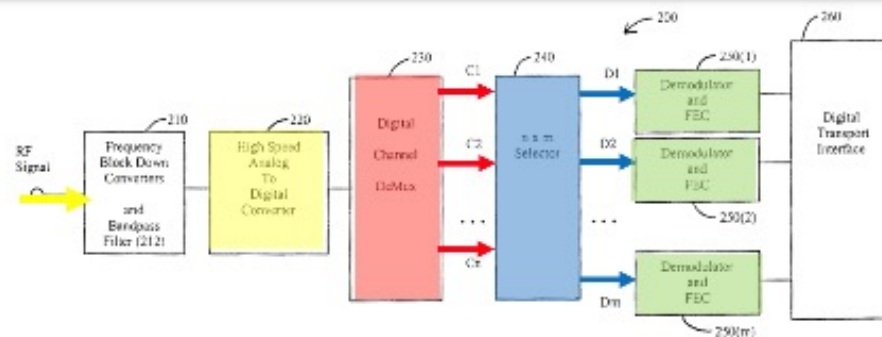


Fig. 2

Channels D_1 - D_m :

- i. No “Selection” Based On Petitioner’s Construction
- ii. Not Selected “From The Input Signal”

Summary: Zhang Channels D_1 - D_m Are Not “Select[ed]” “From The Input Signal” For Similar Reasons As The '362 Patent

D_1 - D_m Are Not “Selected” Under Petitioner’s Construction

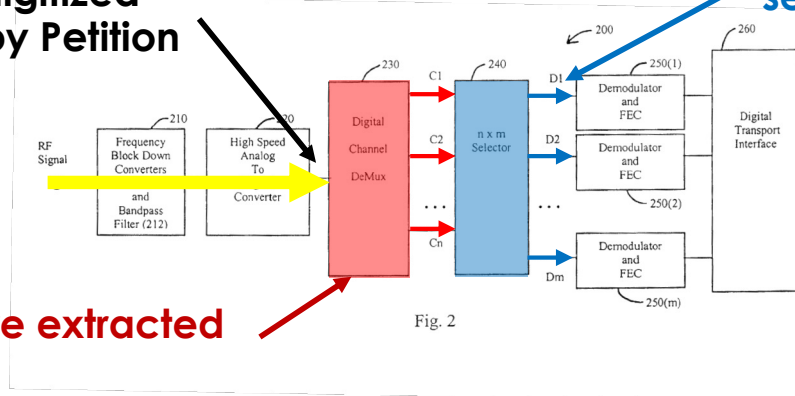
- **Petitioner’s Construction:** “Selection is simply extracting a channel from the plurality of frequencies in the digitized RF signal”
IPR2024-00438 Sur-Reply, 13-15
- **Not Extracted:** D_1 - D_m are not extracted; only selected from already extracted C_1 - C_n
IPR2024-00438 Sur-Reply, 13-15
- **Petitioner’s Expert Agrees:** Selector 240 does not select under this construction
Ex. 2021 [Lett-2nd-Depo-Volume-II] 82:4-18

D_1 - D_m Are Not Selected “From The Input Signal”

Down converted and digitized
input signal identified by Petition

Desired channels D_1 - D_m are
selected from channels C_1 - C_n

All channels C_1 - C_n are extracted
from the input signal



Petitioner Fails To Show Independent Claims:

IPR2024-00432 (9,210,362)

1, 11	" select said plurality of desired television channels from said digitized plurality of frequencies "
-------	--

IPR2024-00435 (11,381,866)

14, 41, 69	[14C] " each digital down converter ... is operable to generate a digital channel output corresponding to each desired channel " [14D] "to provide each digital channel output via a serial interface "
------------	---

1, 27, 55	" DFE is configured to concurrently select and provide each of the plurality of desired channels without providing any of the plurality of undesired channels"
-----------	--

IPR2024-00438 (11,399,206)

1, 25, 51	" selecting each of the plurality of desired channels from the input signal without selecting any of the plurality of undesired channels"
-----------	---

13, 38, 64	[13D] " digitally down converting each desired channel , of the plurality of desired channels, to generate a plurality of digital channel outputs ; [13E] providing the plurality of digital channel outputs via a serial interface "
------------	---

Claims 13, 38, 64: A “Plurality Of Digital Channel Outputs” (1) Generated By “Downconverting Each Desired Channel” And (2) Provided Via A Serial Interface

US 11,399,206

13. A method comprising:
receiving an input signal from a cable network;
digitizing all received channels in the input signal via a wideband analog-to-digital converter (ADC), wherein the received channels comprise a plurality of desired channels and a plurality of undesired channels;
digitally down converting each desired channel, of the plurality of desired channels, to generate a plurality of digital channel outputs; and
providing the plurality of digital channel outputs via a serial interface.

Petitioner Alternatively Relies On Zhang Channels C_1 - C_n And D_1 - D_m As The Claimed “Plurality Of Digital Channel Outputs”

'206 Patent Claim 13:

- [13D] digitally down converting each desired channel, of the plurality of desired channels, to generate a plurality of digital channel outputs; and
- [13E] providing the plurality of digital channel outputs via a serial interface.

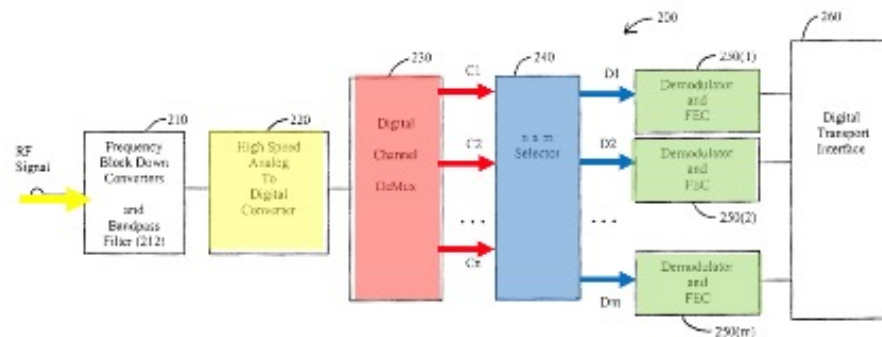


Fig. 2

Channels C_1 - C_n :

- i. Not Same “Outputs” Of Limitation 13[E]
- ii. Not Generated By Downconverting Each Desired Channel

Channels D_1 - D_m :

- i. No An Output Generated By “Down Converting” Channels

Petitioner Relies On Zhang Data Bus 1 In Its Figure 5 For “Providing ... Via A Serial Interface”

'206 Patent Claim 13:

- [13D] digitally down converting each desired channel, of the plurality of desired channels, to generate a plurality of digital channel outputs; and
- [13E] providing the plurality of digital channel outputs via a serial interface.

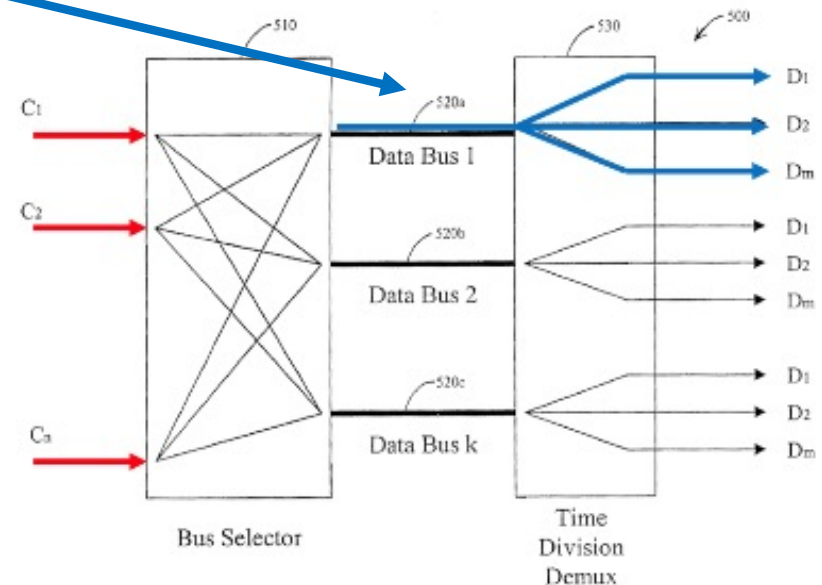
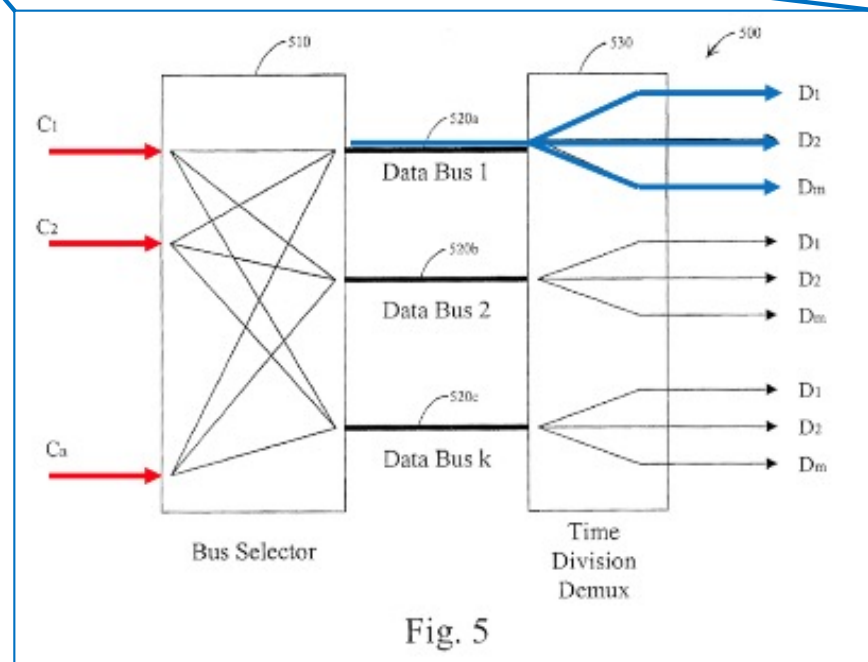
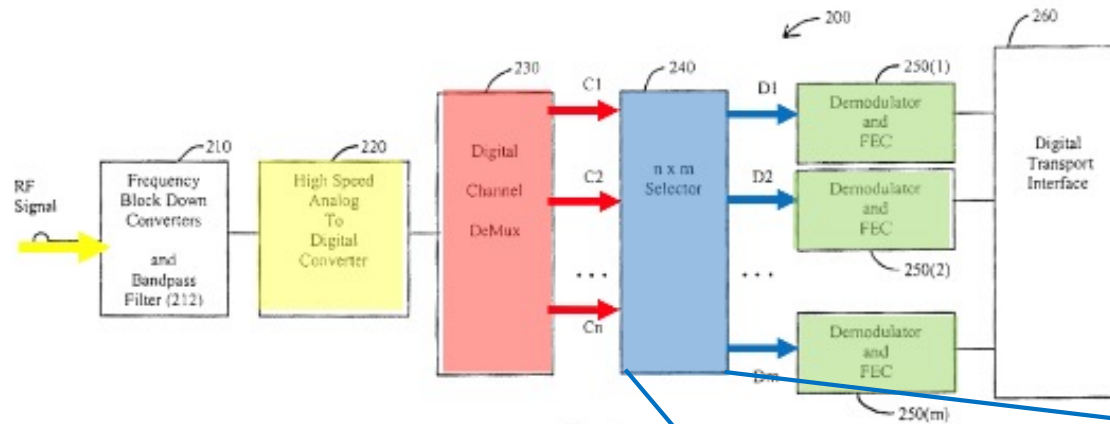
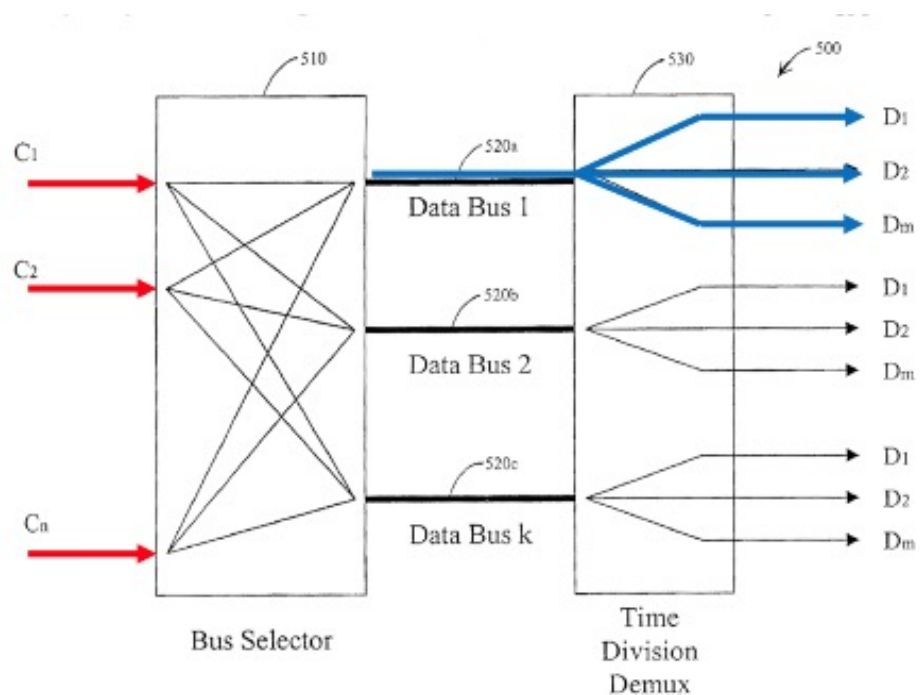


Fig. 5

Zhang Figure 5 Implements Its Selector 240 That Selects Channels D_1 - D_m From All Channels C_1 - C_n



What Is Provided On A Serial Interface (Data Bus 1) In Zhang Figure 5 Is Channels D_1 - D_m , Not Channels C_1 - C_n



Weimin Zhang,

Fig. 5

[0039] In operation, digital selector **500** digitally selects one or more RF channels D_1 to D_m from the digital RF channels C_1 to C_n and then sends them to appropriate demodulators or output ports (not shown) through different data buses (not shown). Because a bus clock is much faster

Reliance On Zhang Channels C_1 - C_n Contradicts Petitioner's Mapping For "Providing" Limitation [13E]

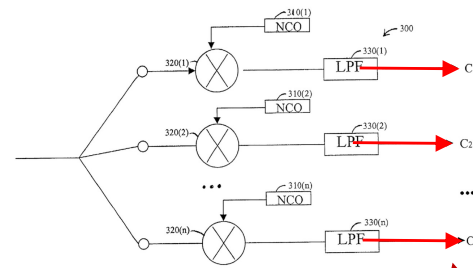


Fig. 3

Zhang down converts C_1 - C_n

'206 Patent Claim 13:

- [13D] digitally down converting each desired channel, of the plurality of desired channels, to generate a plurality of digital channel outputs; and
- [13E] providing the plurality of digital channel outputs via a serial interface.

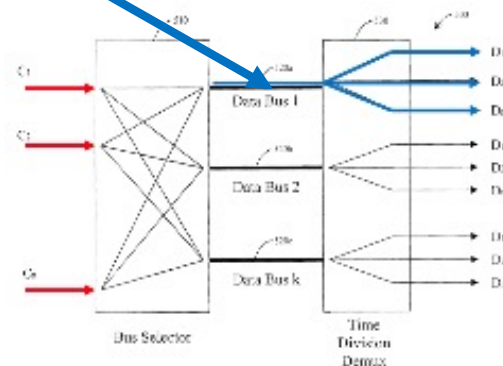


Fig. 5

Zhang provides D_1 - D_m via a serial interface

Theoretical Happenstance That All Channels C_1 - C_n May Be Later Selected And Output Does Not Disclose The Claims

- ***In re Facebook, Inc.***, 743 Fed Appx. 998, 1001-1002 (Fed Cir. 2018) (reversing the Board's anticipation and obviousness determination because even if the examples in the prior art “***happened to result in***” the claimed limitation, “***[n]othing about [the prior art's] algorithm required***” that outcome);
- ***In re Felton***, 484 F.2d 495, 500 (CCPA 1973) (reversing anticipation and obviousness determinations where “***it would be mere happenstance if any structure made according to [the prior art] met the limitations of the claims.***”)



Claims 13, 38, 64: A Method That Generates “A Plurality Of Digital Channel Outputs” By “Down Converting Each Desired Channel”

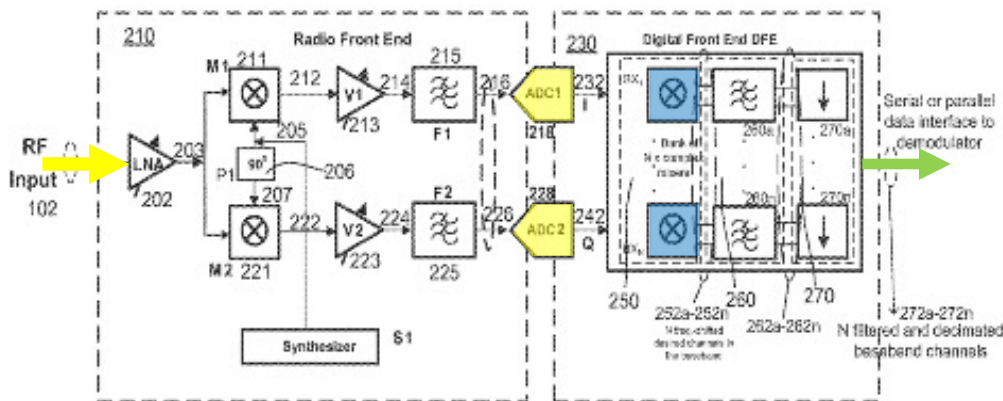
US 11,399,206

13. A method comprising:
receiving an input signal from a cable network;
digitizing all received channels in the input signal via a wideband analog-to-digital converter (ADC), wherein the received channels comprise a plurality of desired channels and a plurality of undesired channels;
digitally down converting each desired channel, of the plurality of desired channels, to generate a plurality of digital channel outputs; and
providing the plurality of digital channel outputs via a serial interface.

Zhang's Indiscriminate Downconverting Of All Channels C_1 - C_n Without Regard Or Knowledge Of Desirability Does Not Disclose The Patent's Method

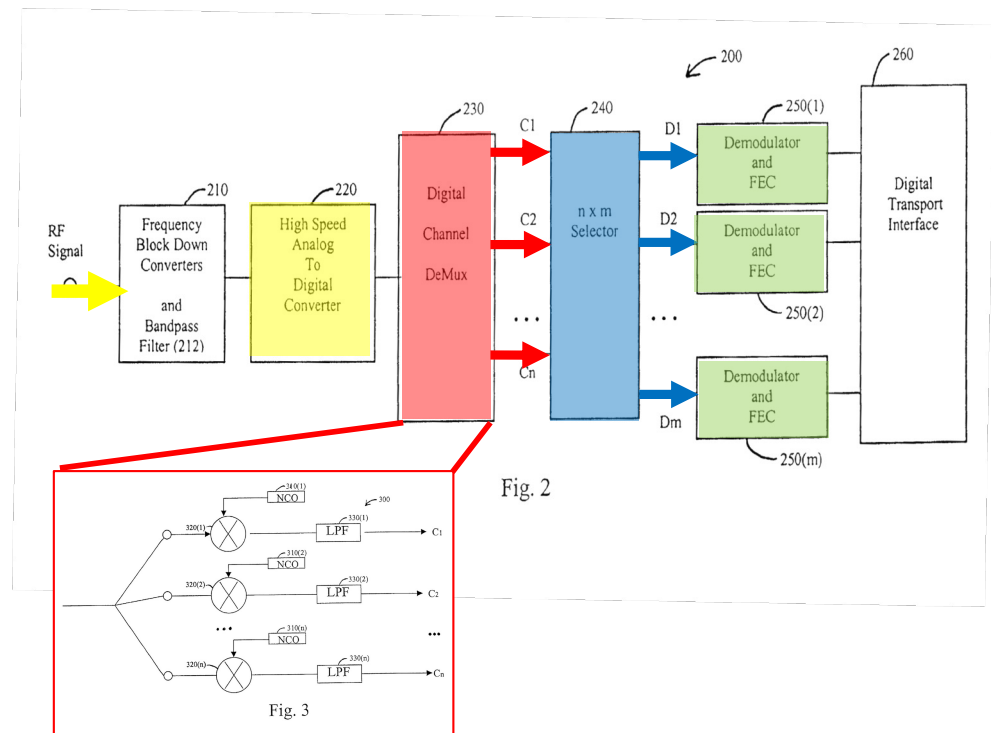
'206 Patent Claim 13 Method:

Generate outputs by “down converting each desired channel of the plurality of desired channels”



Zhang Method:

Generate outputs by down converting all channels without regard to or knowledge of any desirability



“The Very Details” Of How A Process Is Performed Are “At The Heart” Of A Method Claim



“A process patent, however, claims not a structural entity, ‘but rather an operation or series of steps leading to a useful result.’ 1 *Chisum on Patents* § 1.03, at 1-58 (2000). Thus, **the very details regarding how such “useful result” has come about are at the heart of a process patent**, whereas the process by which a patented product is obtained is ordinarily irrelevant to a product patent.”

Amgen, Inc. v. Hoechst Marion Roussel, 126 F. Supp. 2d 69, 101 (D. Mass. 2001) aff’d in relevant part, 314 F.3d 1313, 1346-1347 (Fed. Cir. 2003)

Petitioner Alternatively Relies On Zhang Channels D_1 - D_m As The Claimed “Plurality Of Digital Channel Outputs”

'206 Patent Claim 13:

- [13D] digitally down converting each desired channel, of the plurality of desired channels, to generate a plurality of digital channel outputs; and
- [13E] providing the plurality of digital channel outputs via a serial interface.

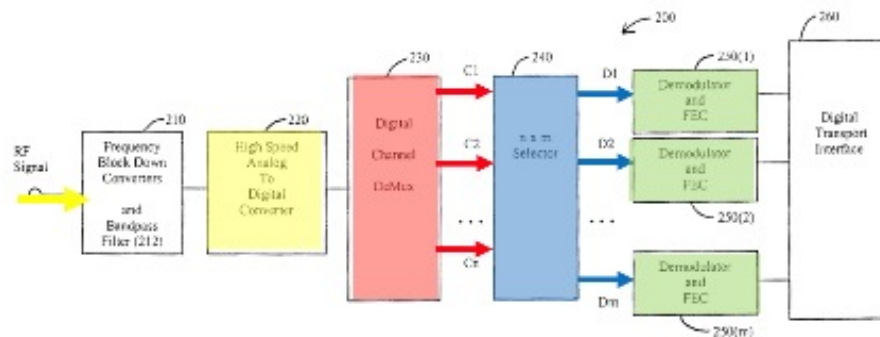


Fig. 2

Channels D_1 - D_m :

- i. No An Output Generated By “Down Converting” Channels

Zhang Outputs D_1 - D_m Are Not “Generate[d]” By “Down Converting” Channels

Outputs C_1 - C_n are generated by down converting all channels

Outputs D_1 - D_m are generated by selecting from already down converted C_1 - C_n

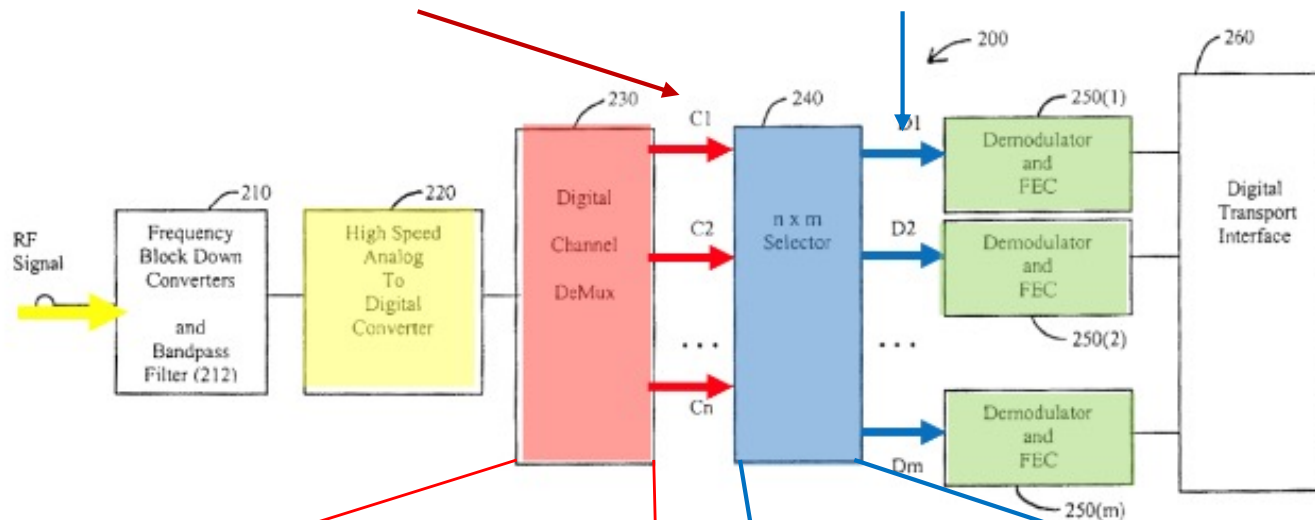


Fig. 2

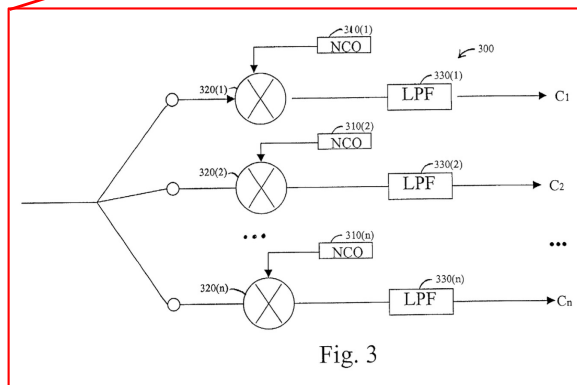


Fig. 3

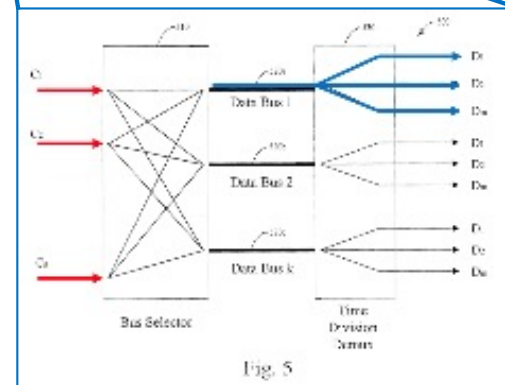
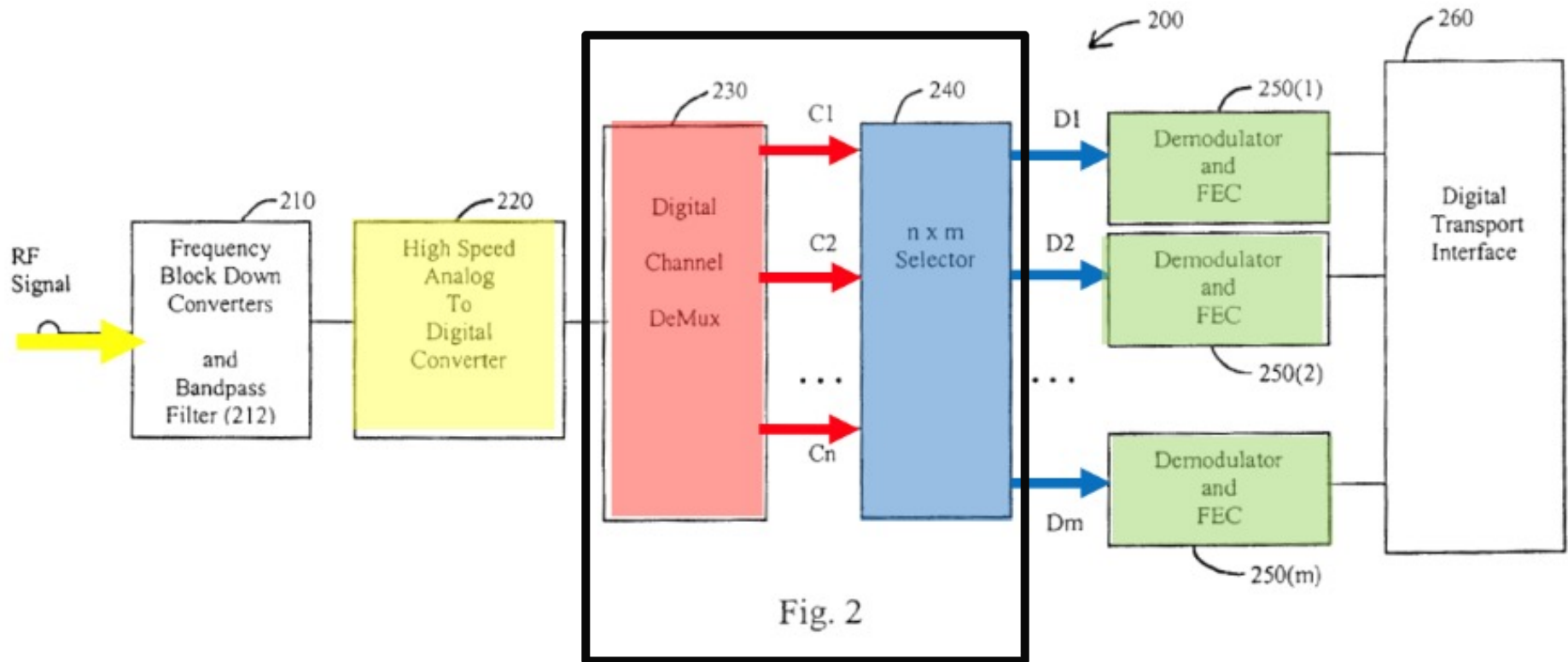


Fig. 5

Reply: Demultiplexer 230 And Selector 240 Together Are The Circuitry That Generates Outputs D_1 - D_m



Alleged circuitry that generates **outputs D_1 - D_m**

Petitioner's Box Drawing Does Not Change The Architecture Of Zhang

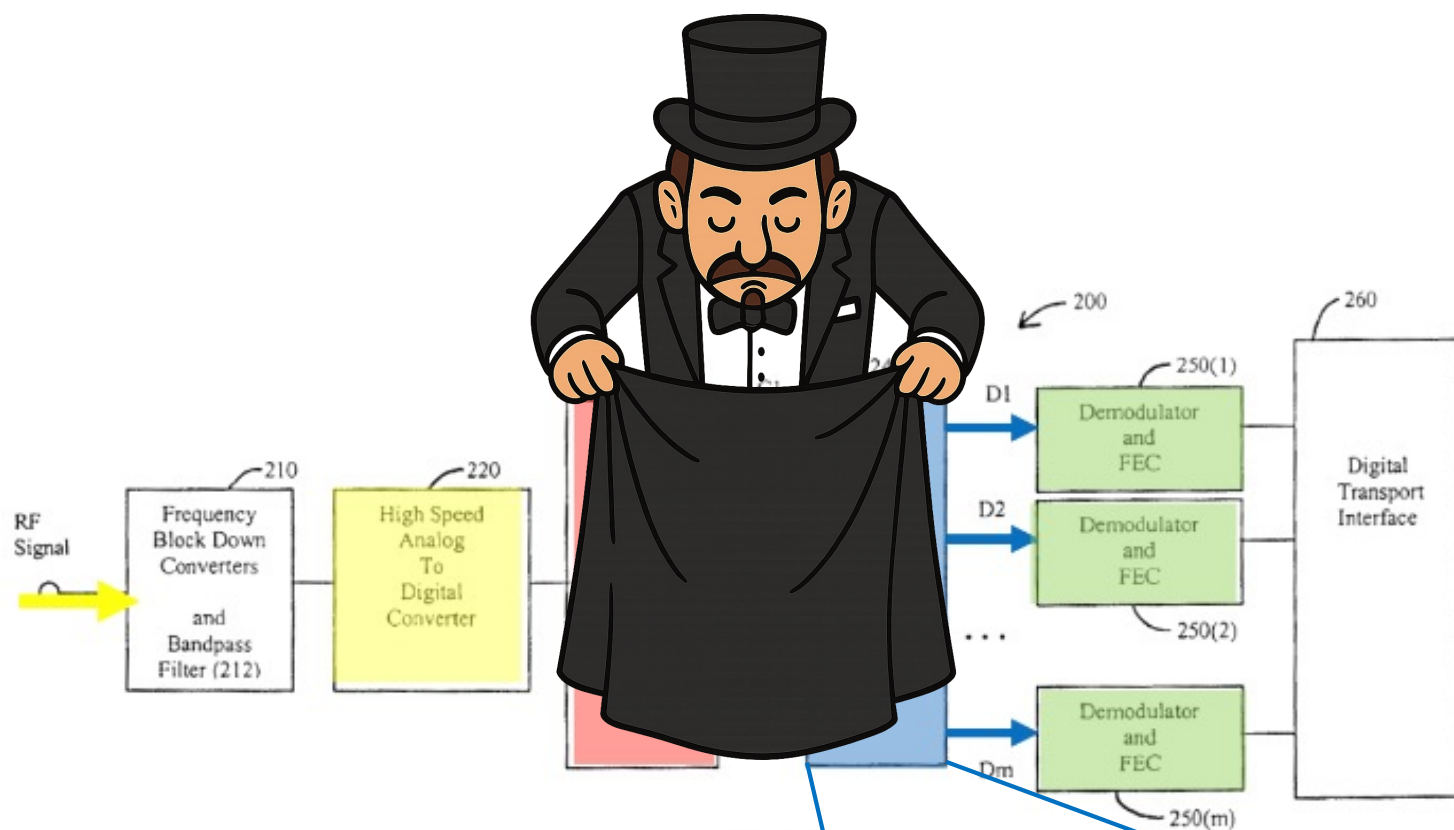
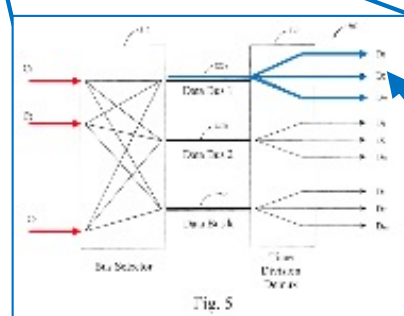


Fig. 2



Outputs D_1 - D_m Are Still Generated By Selecting From Channels C_1 - C_n , Not By Down Converting



Reserve

Zhang Demultiplexer 230 Cannot Meet The Claimed “Provide” Because It Also Provides Undesired Channels

'866 Pat. Cl. 1:

a digital frontend (DFE) coupled to the wideband ADC, wherein the DFE is configured to concurrently select and provide each of the plurality of desired channels, via a serial interface, without providing any of the plurality of undesired channels.

All Channels C_1 - C_n , both desired and undesired

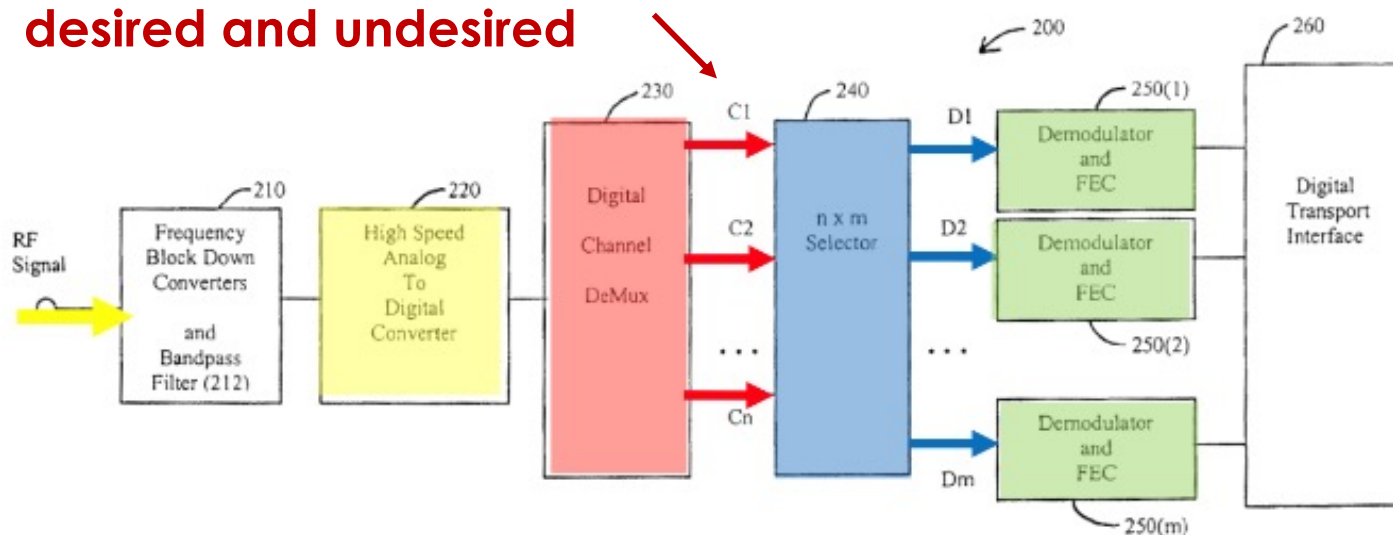


Fig. 2

Petitioner's Expert Confirms That Zhang Channels C_1 - C_n Are Not Desired Channels

DECLARATION OF DAVID B. LETT

[0010], [0023], [0025], [0027], [0030]-[0037], [0041]-[0042]. A digital channel demultiplexer 230 (green/purple) then separates signals of all the content channels in the digital RF signals (e.g., channels C_1 to C_n), while a nxm digital selector 240 selects and forwards only signals for a subset of content channels selected by a subscriber (e.g., channels D_1 to D_m) to one or more of demodulators 250(1), 250(2), . . . 250(m) (blue), which may be “shared demodulators” with common functional blocks. Ex. 1013, [0010]-[0011], [0028]-[0029], [0042], [0047], claims 1, 4, 9, 31-

IPR2024-00432 Ex. 1002 [Lett-Decl.] ¶ 79