

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,

Petitioner,

v.

INTELLECTUAL VENTURES II LLC

Patent Owner.

Case No. IPR2025-00343

U.S. Patent No. 10,292,138

Patent Owner Demonstrative Exhibits

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

1

Overview Of The '138 Patent

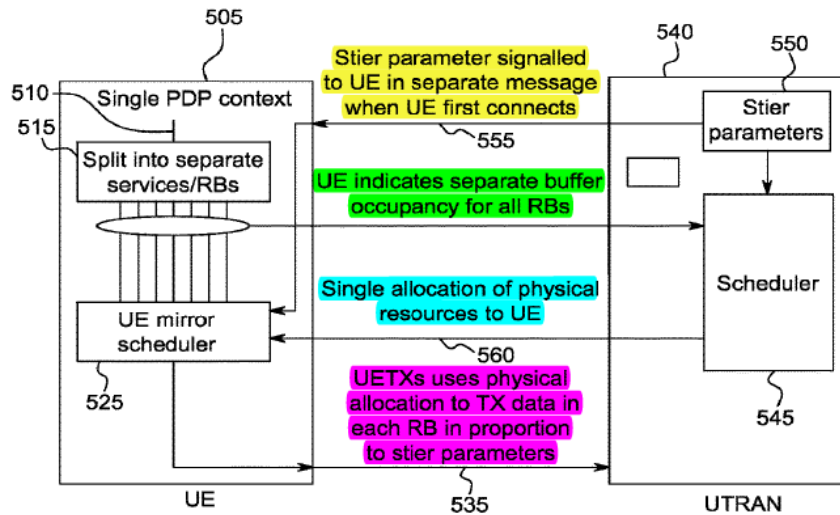


FIG. 5

The UTRAN (the network) signals S_{tier} parameters (used for determining weightings) to the UE.

The UE sends separate buffer occupancies for its RBs to the UTRAN.

The UTRAN scheduler allocates resources for each queue, and then sums them together and sends "only a single physical allocation" to the UE.

The UE uses a "mirror scheduler" which mirrors the logic in the UTRAN. The UE scheduler "takes the single physical allocation and splits it between different RBs using the weight S_{tier} values."

Ex. 1001, 9:36-50; FIG. 5; POR, 8-10.

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2

A Single Physical Allocation Of Resources Is Provided To The UE

SUMMARY OF INVENTION



In one embodiment of the present invention, the apparatus further comprises a transmitter transmitting the set of weight values to the wireless communication unit. This feature provides the advantage that the UE can then properly prioritize traffic whilst receiving a single physical allocation from the network and not have to use the simple absolute priority system defined in 3GPP.

Ex. 1001, 4:30-36.

* * *

DETAILED DESCRIPTION



If there are multiple QoS requirements within a single 3GPP PDP context, a single physical allocation of radio resources may be made to the UE. In this manner, a single PDP context implies a single CCTrCh. This single physical allocation of radio resources provided to a UE is shared amongst a number of services, in proportion to their respective QoS requirements, for example in proportion to the signalled weight values (S_{tier}).

Ex. 1001, 9:36-49.

The network knows separate buffer occupancies associated with each RB. Therefore, the logic required to operate the uplink case is largely unchanged compared with the aforementioned downlink case. However, as only a single physical allocation is signaled to the UE, all the physical allocations associated with each queue are summed together.

* * *

WORKING EXAMPLE (FIG. 6)



RAAU represents a quantum of physical resource (codes and timeslots); and
FreeRAAU is a number of free RAAU that the resource allocator (RA) can share out.

Ex. 1001, 11:7-11.

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POR, 4-5.

3

One Problem – Separate Allocation Messages For Small Amounts Of Data Were Undesirable

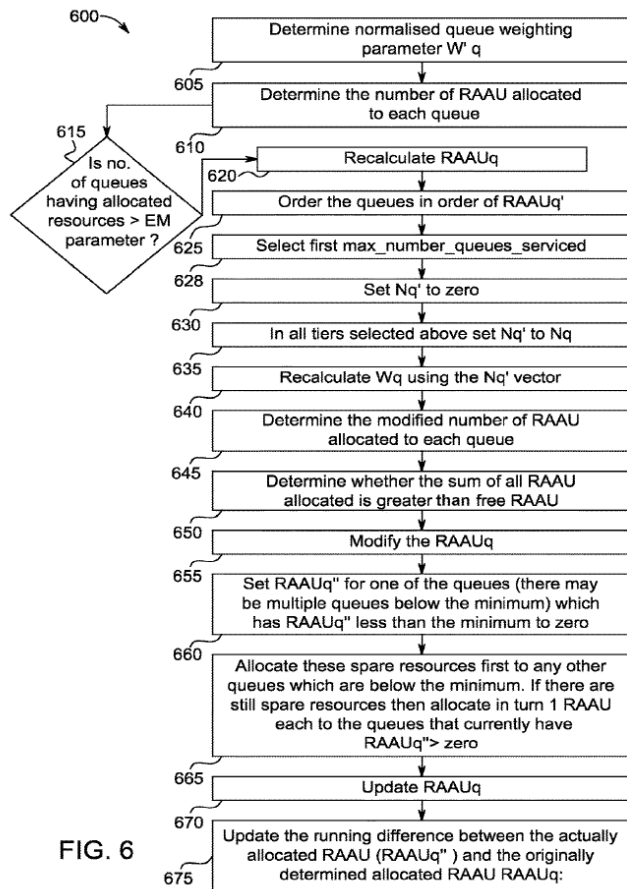
As each SLA is can now be split into multiple RBs it may be the case that **very small proportions of the overall resources are allocated to each RB**. This may create signaling problems, as the mechanism may result in a large number of individual users being allocated some resource at any one time and each user will require **a separate allocation message**. Therefore, in an enhanced embodiment of the present invention, a mechanism to implement additional functionality to limit a total number of queues served, e.g. to be allocated resource allocation units, is described. Thus, this algorithm **limits a number queues that can be allocated resource at any one instance, for example to an operator-specified value**. The algorithm may also ensure that the ratio of allocated resource is maintained, over the long term, to the ratios specified by the Stier values.

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Ex. 1001, 10:32-45; POR, 5.

4

Overview Of The Allocation Algorithm Of The '138 Patent



A single allocation of physical resources is provided to the UE during each transmission cycle. S_{teir} parameters (used to determine weightings (W'_q and W''_q)) are also sent to the UE.

The UE distributes that single allocation to only subset of queues in order to address signalling problems that may occur when a radio bearer is allocated a very small proportion of resources.

In each transmission cycle, the weights (W'_q and W''_q) are used to iteratively determine resource allocations ($RAAU_q$, $RAAU'_q$ and $RAAU''_q$) for a subset of the queues.

A running counter ($running_RAAU_delta_q$) for each queue tracks the under/over allocation of resources to each queue over time to achieve fairness.

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Ex. 1001, FIG. 5; POR, 5-6, 9.

5

FIG. 6 DISCLOSES HOW THE UE SHARES OUT THE SINGLE PHYSICAL ALLOCATION (FreeRAAU) ACROSS A SUBSET OF THE QUEUES

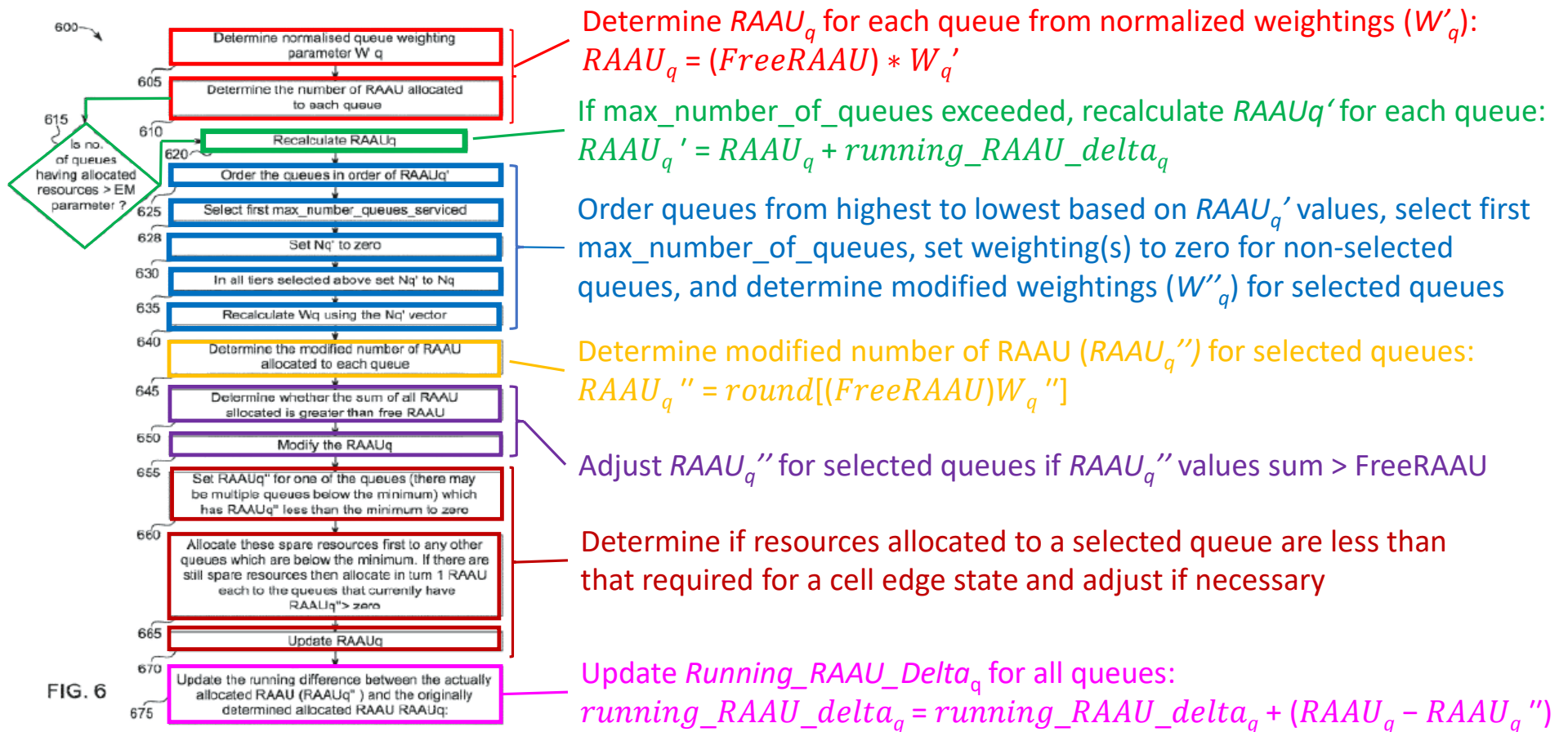


FIG. 6

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Ex. 1001, FIG. 6; POR, 11-24.

6

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

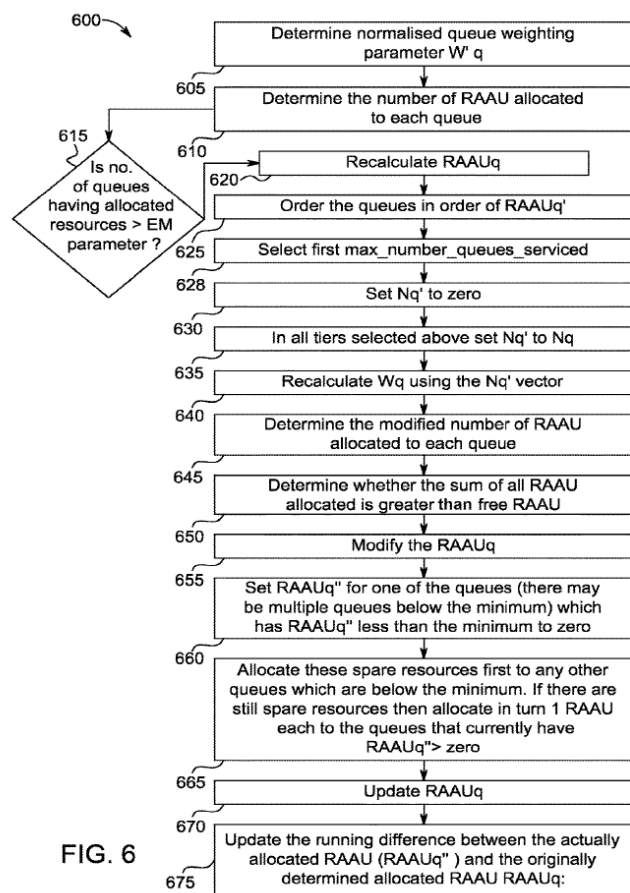


FIG. 6

Starting Values

FreeRAAU = 40

max_num_queues_served = 3

cell edge minimum = 7

Queue Number	q1	q2	q3	q4
S_{tier} value for queue (S_q)	0.3	0.3	0.2	0.2
running_RAAU_delta for queue	0	0	0	0
Initial fill level for each queue (N_q)	110	100	55	50

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Ex. 1001, FIG. 6; POR, 12.

7

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

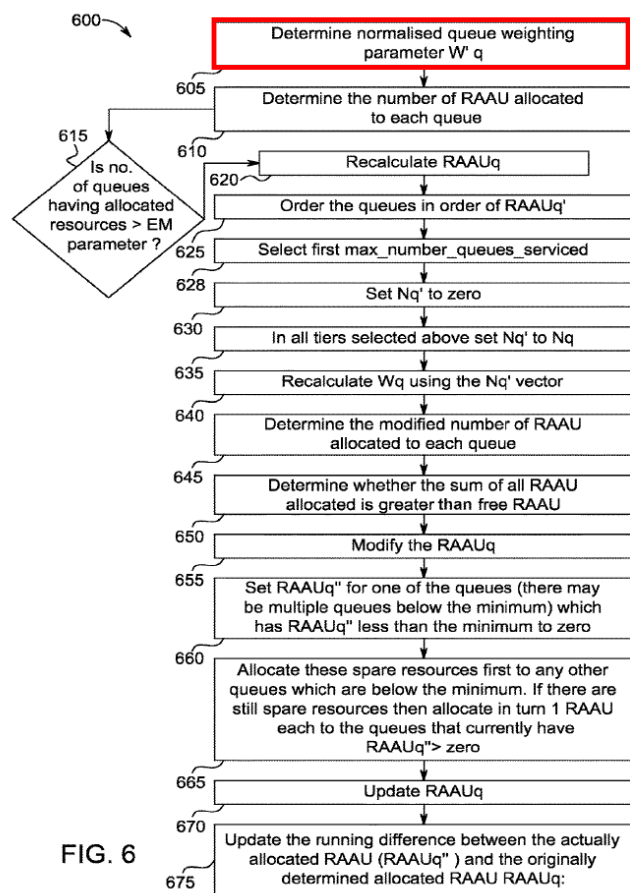


FIG. 6

Ex. 1001, FIG. 6; POR, 12-14.

Step 605 - Determine Normalized Queue Weightings (W'_q)

$$W'_q = \frac{S_q N_q}{\sum_q S_q N_q} \quad \text{Equation [6]}$$

Queue Number	q1	q2	q3	q4
S_{tier} value for queue (S_q)	0.3	0.3	0.2	0.2
Initial fill level for each queue (N_q)	110	100	55	50

$$\sum_q S_q N_q = (0.3 * 110) + (0.3 * 100) + (0.2 * 55) + (0.2 * 50) = 84$$

$$W'_1 = \frac{33}{84} = 0.39286$$

$$W'_3 = \frac{11}{84} = 0.13095$$

$$W'_2 = \frac{30}{84} = 0.35714$$

$$W'_4 = \frac{10}{84} = 0.11905$$

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ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

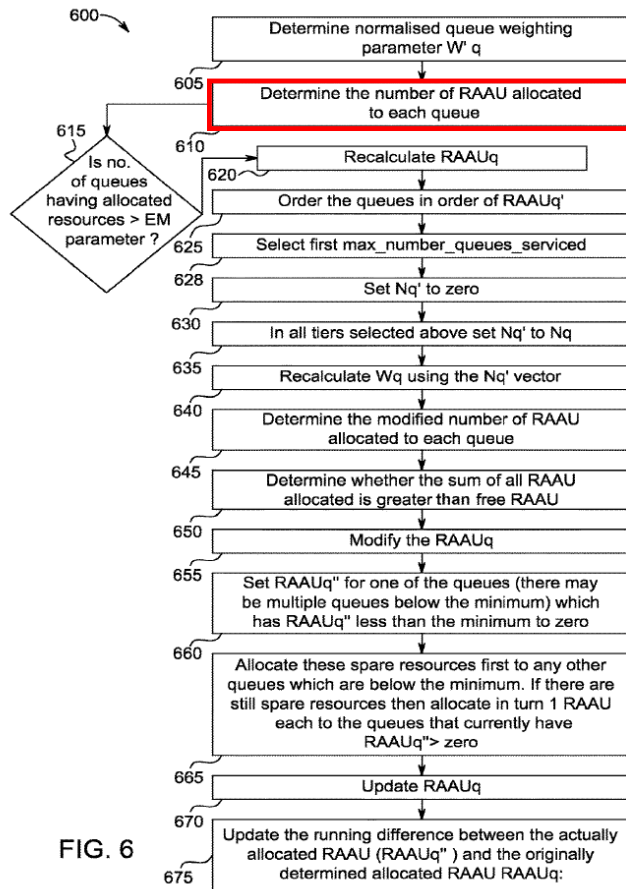


FIG. 6

Ex. 1001, FIG. 6; POR, 14-15.

Step 610 - Determine Queue Allocations ($RAAU_q$)

$$RAAU_q = (FreeRAAU) * W'_q \quad \text{Equation [7]}$$

Starting Value of $FreeRAAU = 40$

$$W'_1 = 0.39286 \quad W'_2 = 0.35714 \quad W'_3 = 0.13095 \quad W'_4 = 0.11905$$

$$RAAU_1 = (40)(0.39286) = 15.714$$

$$RAAU_3 = (40)(0.13095) = 5.2380$$

$$RAAU_2 = (40)(0.35714) = 14.286$$

$$RAAU_4 = (40)(0.11905) = 4.7620$$

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ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

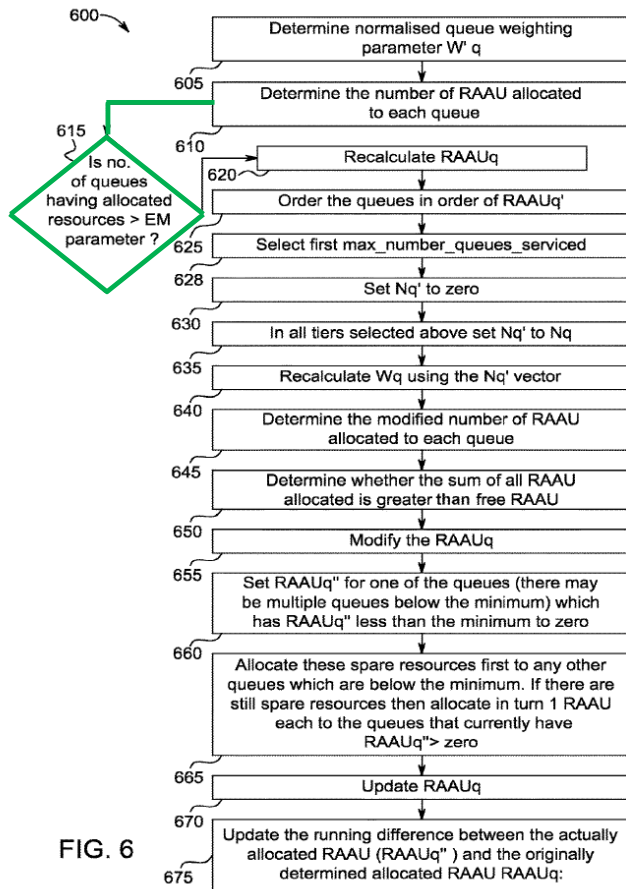


FIG. 6

Ex. 1001, FIG. 6; POR, 15.

Step 615 - Determine If “max_number_of_queues_served” Is Exceeded

Starting Value of max_number_of_queues_served = 3

Four queues had resources allocated to them in previous step:

$$RAAU_1=15.714 \quad RAAU_2=14.286 \quad RAAU_3=5.2380 \quad RAAU_4=4.7620$$

The number of queues having resources allocated (4 queues) exceeds the max_num_queues_served (3 queues).

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10

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

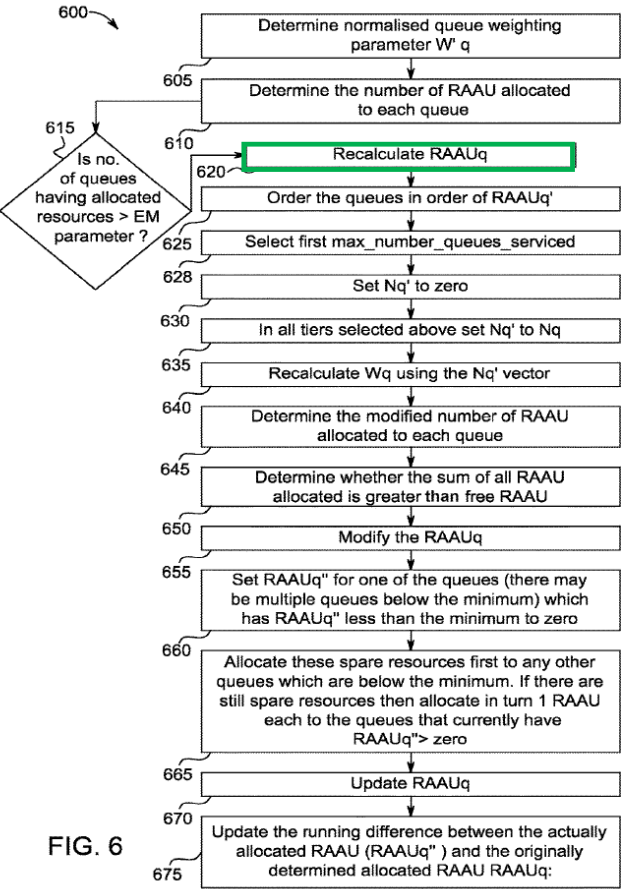


FIG. 6

Ex. 1001, FIG. 6; POR, 15-17.

Step 620 - Recalculate Queue Allocations ($RAAU_q$)

$$RAAU'_q = RAAU_q + running_RAAU_delta_q \quad \text{Equation [8]}$$

Queue Number	q1	q2	q3	q4
running_RAAU_delta for queue	0	0	0	0

$$RAAU'_1 = RAAU_1 + 0$$

$$= 15.714$$

$$RAAU'_3 = RAAU_3 + 0$$

$$= 5.238$$

$$RAAU'_2 = RAAU_2 + 0$$

$$= 14.286$$

$$RAAU'_4 = RAAU_4 + 0$$

$$= 4.762$$

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

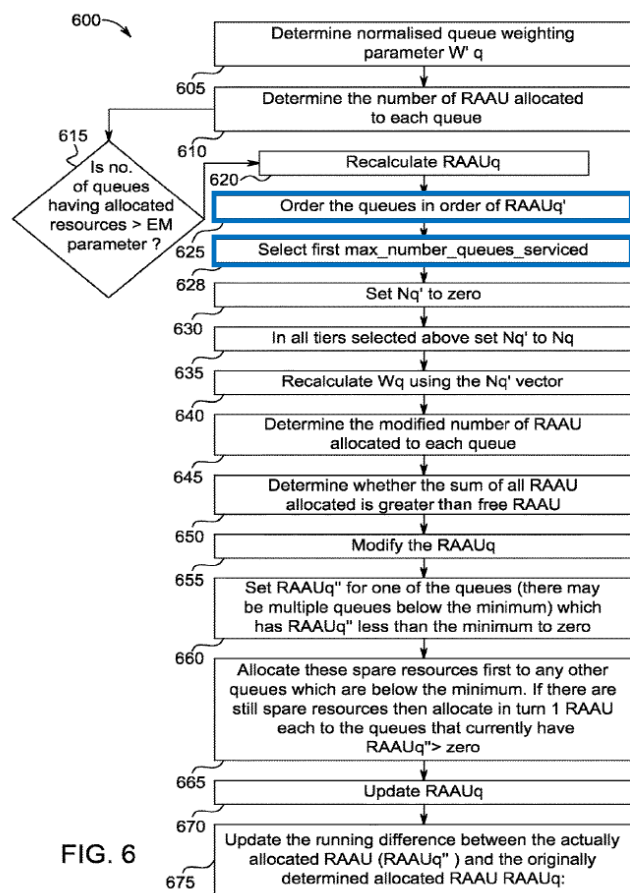


FIG. 6

Ex. 1001, FIG. 6; POR, 17-18.

Step 625 - Order queues based on $RAAU_q'$ values

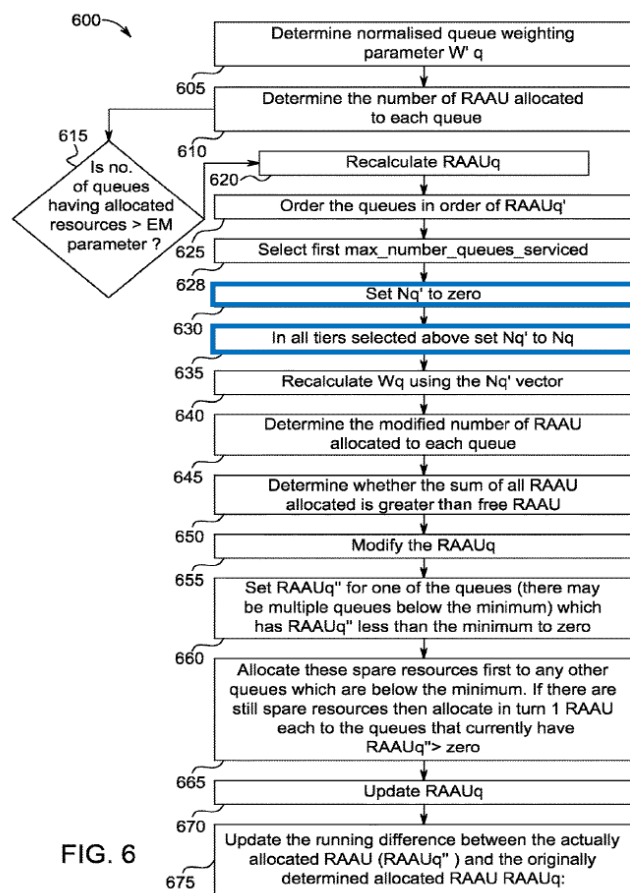
Rank	Queue	$RAAU_q'$
1	q1	15.714
2	q2	14.286
3	q3	5.238
4	q4	4.762

Step 628 - Select the first “max_number_of_queues_served” (=3) from ordered list

Rank	Queue	$RAAU_q'$
1	q1	15.714
2	q2	14.286
3	q3	5.238
4	q4	4.762

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ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT



Step 630 – Set N_q' to zero for all queues not selected in step 628

Step 635 – Set $N_q' = N_q$ for all queues selected in step 628

Queue	N_q (from Step 605)	Queue Selected in Step 628?	N_q' Set In Steps 630 and 635
q1	110	YES	110
q2	100	YES	100
q3	55	YES	55
q4	50	NO	0

Ex. 1001, FIG. 6; POR, 18-19.

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13

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

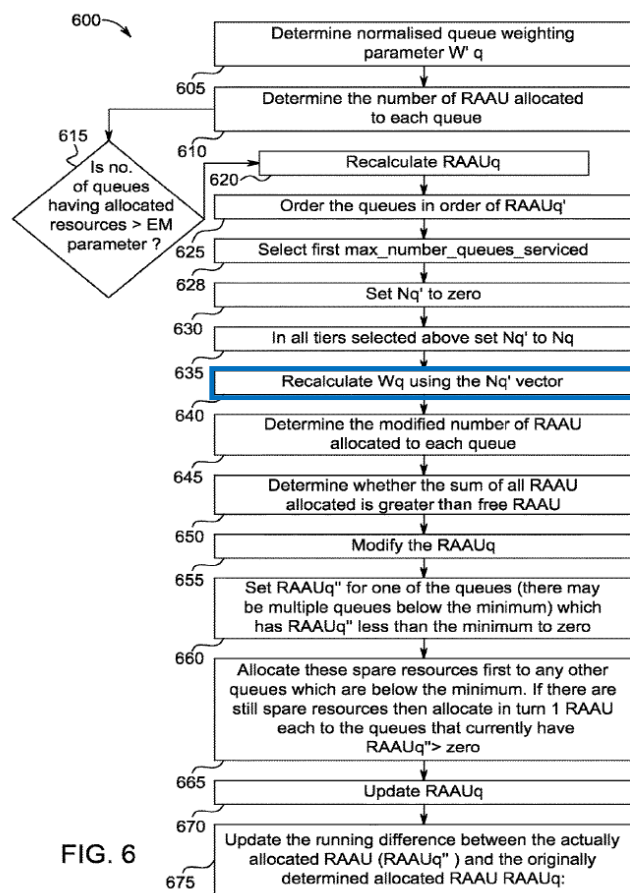


FIG. 6

Step 640 - Determine New Normalized Queue Weightings (W''_q)

$$W''_q = \frac{S_q N'_q}{\sum_q S_q N'_q} \quad \text{Equation [10]}$$

$$\sum_q S_q N'_q = (0.3 * 110) + (0.3 * 100) + (0.2 * 55) + (0.2 * 0) = 74$$

$$W''_1 = \frac{33}{74} = 0.4459$$

$$W''_2 = \frac{30}{74} = 0.4054$$

$$W''_3 = \frac{11}{74} = .1486$$

$$W''_4 = \frac{0}{74} = 0.000$$

Ex. 1001, FIG. 6; POR, 19-20.

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14

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

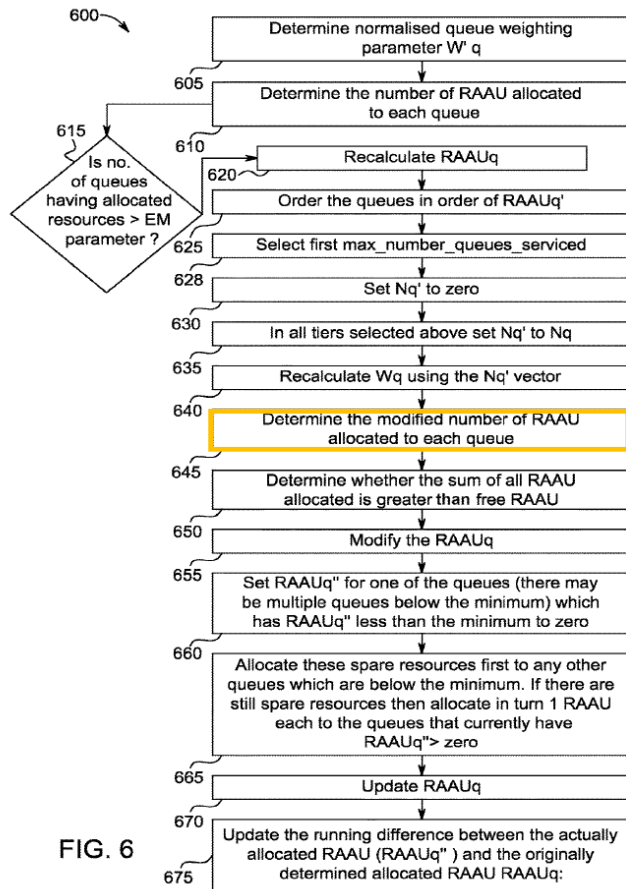


FIG. 6

Step 645 - Determine modified number of RAAU ($RAAU_q''$) for selected queues:

$$RAAU_q'' = \text{round}[(FreeRAAU)W_q''] \quad \text{Equation [11]}$$

Starting Value of $FreeRAAU = 40$

$$W_1'' = 0.4459 \quad W_2'' = 0.4054 \quad W_3'' = 0.1486 \quad W_4'' = 0$$

$$\begin{aligned} RAAU_1'' &= (40)(0.4459) \\ &= 17.84 \\ &\rightarrow 18 \end{aligned}$$

$$\begin{aligned} RAAU_3'' &= (40)(0.1486) \\ &= 5.944 \\ &\rightarrow 6 \end{aligned}$$

$$\begin{aligned} RAAU_2'' &= (40)(0.4054) \\ &= 16.22 \\ &\rightarrow 16 \end{aligned}$$

$$\begin{aligned} RAAU_4'' &= (40)(0.0000) \\ &= 0 \\ &\rightarrow 0 \end{aligned}$$

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Ex. 1001, FIG. 6; POR, 20-21.

15

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

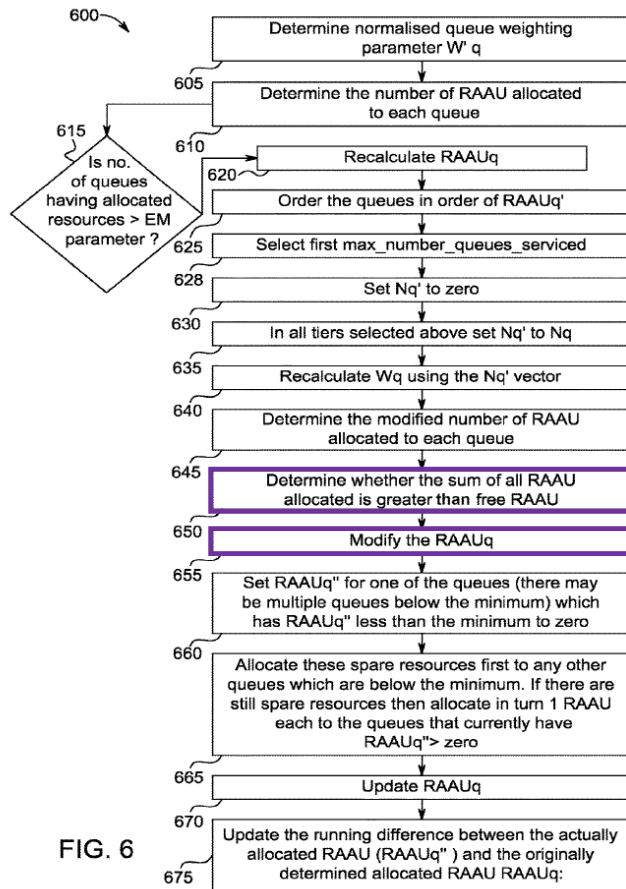


FIG. 6

Step 650 - Determine if $RAAU_q''$ values sum > FreeRAAU

$$RAAU_1'' = 18 \quad RAAU_2'' = 16 \quad RAAU_3'' = 6 \quad RAAU_4'' = 0$$

$$\Sigma (RAAU_1'' = 18) + (RAAU_2'' = 16) + (RAAU_3'' = 6) + (RAAU_4'' = 0) = 40$$

FreeRAAU = 40, thus the sum of all $RAAU_q''$ does not exceed FreeRAAU

Step 655 - Adjust $RAAU_q''$ for selected queues if sum of $RAAU_q''$ > FreeRAAU

No adjustment needed

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

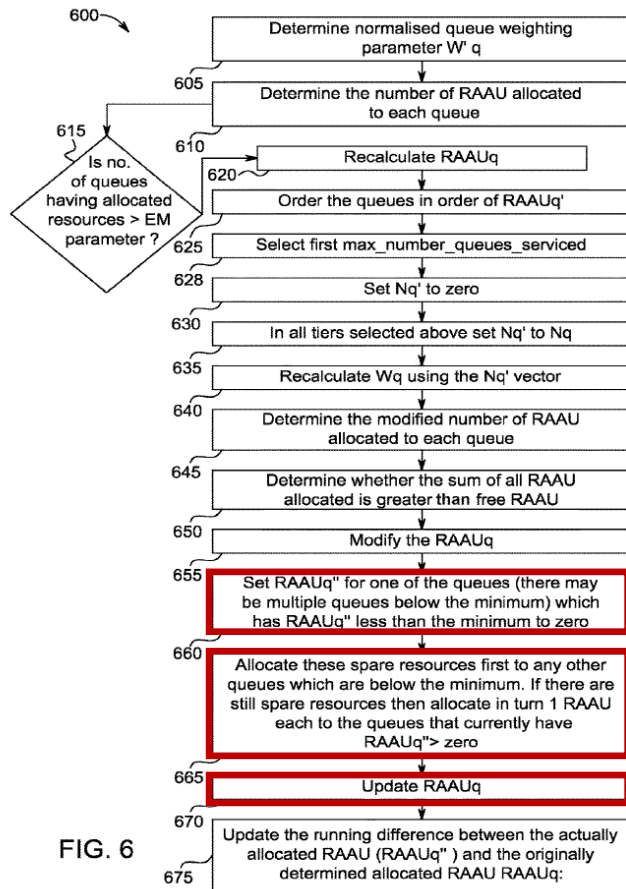


FIG. 6

Step 655: Set $RAAU_q'' = 0$ for any queue having an $RAAU_q''$ allocation that is less than the minimum RAAU required for the cell edge state

cell edge minimum = 7

$$RAAU_1'' = 18 \quad RAAU_2'' = 16 \quad RAAU_3'' = 6 \quad RAAU_4'' = 0$$

The volume of resources allocated to q3 ($RAAU_3'' = 6$) is 6, which is less than the cell edge state minimum of 7.

Thus, $RAAU_3''$ is set to zero.

Step 660: Allocate spare resources from q3 to other queues with $RAAU_q'' > 0$

Half of the 6 RAAU from q3 (or 3 RAAU) are reallocated to q1 and the other half of the 6 RAAU from q3 (or 3 RAAU) are reallocated to q2.

Step 665: Update $RAAU_q''$ values:

$$RAAU_1'' = 18 + 3 = 21 \quad RAAU_2'' = 16 + 3 = 19 \quad RAAU_3'' = 0 \quad RAAU_4'' = 0$$

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Ex. 1001, FIG. 6; POR, 22-23.

17

ILLUSTRATION OF ALLOCATION PROCESS DISCLOSED IN FIG. 6 OF THE '138 PATENT

Step 675 - Update $Running_RAAU_Delta_q$ for each queue

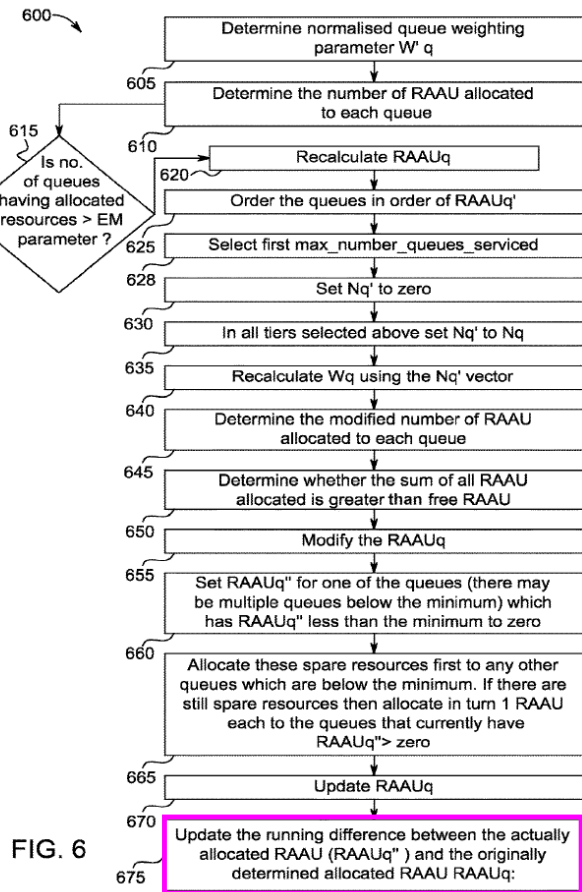
$$running_RAAU_delta_q = running_RAAU_delta_q + (RAAU_q - RAAU_q'') \quad \text{Equation [12]}$$

$$\begin{aligned} running_RAAU_delta_1 &= running_RAAU_delta_1 + (RAAU_1 - RAAU_1'') \\ &= 0 + (16 - 21) \\ &= -5 \end{aligned}$$

$$\begin{aligned} running_RAAU_delta_2 &= running_RAAU_delta_2 + (RAAU_2 - RAAU_2'') \\ &= 0 + (14 - 19) \\ &= -5 \end{aligned}$$

$$\begin{aligned} running_RAAU_delta_3 &= running_RAAU_delta_3 + (RAAU_3 - RAAU_3'') \\ &= 0 + (5 - 0) \\ &= 5 \end{aligned}$$

$$\begin{aligned} running_RAAU_delta_4 &= running_RAAU_delta_4 + (RAAU_4 - RAAU_4'') \\ &= 0 + (5 - 0) \\ &= 5 \end{aligned}$$



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Ex. 1001, FIG. 6; POR, 23-25.

18

Summary Of Allocation Process Disclosed In '138 Patent

A single allocation of physical resources (called "FreeRAAU") is provided to the UE during each transmission cycle.

The "single allocation" corresponds to a finite "quantum of physical resources" that can be shared out, such as the resources defined by a combination of spreading codes and timeslots.

The UE shares out that single allocation among only subset of queues in order to address signalling problems that may occur when a radio bearer is allocated a very small proportion of resources.

In each transmission cycle, the weights (W'_q and W''_q) are used to iteratively determine resource allocations ($RAAU_q$, $RAAU'_q$ and $RAAU''_q$) for a subset of the queues.

A running counter ($running_RAAU_delta_q$) for each queue tracks the under/over allocation of resources to each queue over time to achieve fairness.

POR, 5-6, 25-27; Ex. 1001, 9:39-43 and 11:7-10.

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19

Claim 1 Of The '138 Patent

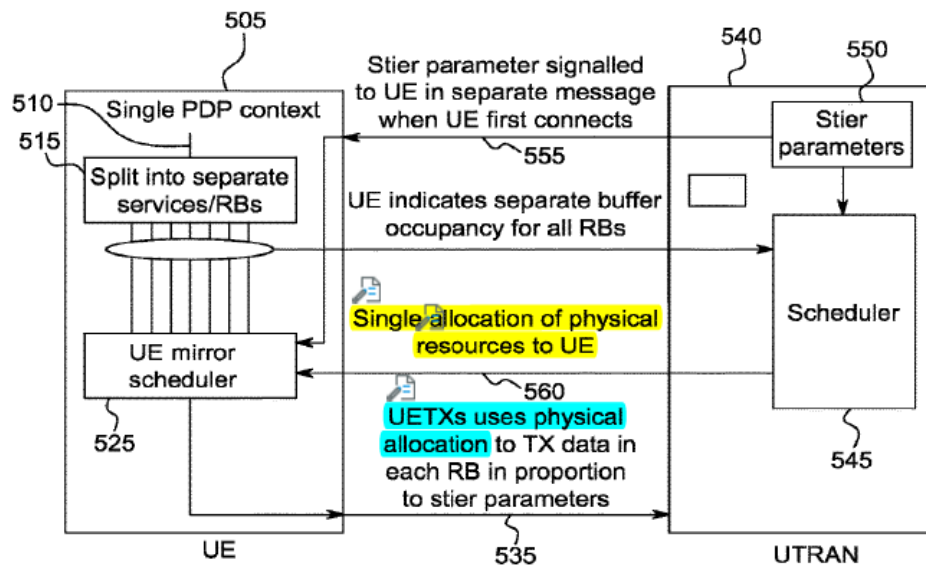


FIG. 5

A user equipment (UE) comprising:
 a processor communicatively coupled to a transmitter and circuitry configured to receive; and
 the processor is configured to:

- cause the circuitry to receive parameters associated with a plurality of radio bearers,
- determine a plurality of buffer occupancies, wherein each of the plurality of buffer occupancies is associated with one or more radio bearers of the plurality of radio bearers,
- cause the transmitter to transmit a message including the plurality of buffer occupancies to a network,
- cause the circuitry to receive a single allocation of uplink resources,
- select data from the plurality of radio bearers for transmission using the single allocation of uplink resources, wherein the selection of the data occurs using a first iteration and a second iteration,
- wherein in the first iteration, the selection of the data is selected from a subset of the plurality of radio bearers based on the received parameters,
- wherein in the second iteration, the selection of the data is based on buffered data for respective radio bearers, and
- cause the transmitter to transmit a signal including the selected data.

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POR, 9, 26.

20

The Petition Challenges Independent Claims 1 And 8 With One Ground

Ground 1 alleges that independent claims 1 and 8 are obvious over Eckert in view of Lohr-1 and Bucknell.

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POR, 30.

21

Eckert Explained That A Very Simple Control Header Can Be Used To Signal The Makeup Of The Transmitted Data When A Transmission Is Limited To Data From Only One Queue

The Background of Eckert contained a description of the High Speed Downlink Shared Channel (HS-DSCH) set forth in the UMTS communication standard. Ex. 1005, [0018].

The standard specified that all the MAC-hs SDUs in a transmission time interval belong to the same priority queue, i.e. in each transmission time interval only MAC-hs SDUs having the same priority are transmitted on an HS-DSCH transport channel. *Id.*, [0020].

Since in each data transmission “data from just one priority queue are transmitted,” the control data header “has a very simple structure and it is necessary to transmit only the information regarding the priority queue from which the data to be transmitted originate.” *Id.*, [0022] (emphasis added).

Eckert Identified As Problematic The Signaling Overhead In The Control Header Of A Data Unit Containing Data From Multiple Queues

The Background in Eckert also discussed the then recent introduction of “a new dedicated transport channel called Enhanced Dedicated Channel (E-DCH).” Ex. 1005, [0012].

In contrast to the HS-DSCH, in the E-DCH framework “data from various priority queues, are transmitted in an MAC-e protocol data unit within a data transmission time interval.” *Id.*, [0023] (emphasis added).

Eckert then identified a problem: how should a device transmitting data from multiple queues signal to the receiver the specifics of the queue(s) from which the data transmitted in the MAC-e protocol data unit originated, as well as the amount of data from each such queue being transmitted. *Id.*, [0024]-[0027].

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POR, 31-32.

23

Eckert Explained That An *Enormous* Amount Of Data Signaling Data Would Be Required For Packets With Data From *Multiple Queues* If The Header Of Every Packet Needed To Identify The Flow-IDs and Queue-IDs Of The Data In The Packet

One possible solution to signaling the association of an MAC-e SDU, i.e. an MAC-d PDU, for example, with a respective priority queue and with a respective MAC-d data stream would be to add to each MAC-e SDU *a control data header with an identification of the respective MAC-d flow (flow-ID, FID) and then to add a control data header with an identification of the respective priority queue (queue ID, QID) to every single data packet from a priority queue before transmission*, so as then to be able to split the data at the receiver again as appropriate in the data link layer.

However, this would be *disadvantageous* on account of the *enormous volume of additional signalling data in the control data header (large overhead) which is required*. ...

On the basis of the prior art, it is thus *merely possible to signal the total size of an MAC-e protocol data unit but not how the data of an MAC-e protocol data unit need to be made up, i.e. from which priority queues how many and using what packet size* it is necessary to transmit data in an MAC-e protocol data unit. *Id.*, [0024]-[0027] (emphasis added).

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POR, 32-33.

24

Eckert Set Out To Provide A Solution That *Reduced* The Signaling Overhead In
The Control Header Of A Data Unit Containing Data From Multiple Queues

Eckert begins the Detailed Description by stating that the invention was directed toward reducing signalling complexity for packets with data from multiple queues:

The invention is based on the problem of mapping data from at least one logical channel onto at least one transport channel in a data link layer protocol unit in simple fashion with reduced signalling complexity in comparison with known procedures. *Id.*, [0040] (emphasis added).

Thus, Eckert's goal was to reduce the amount of additional *signalling data* that a UE operating in the E-DCH framework needed to send to the network in order to inform the network of the makeup of the transmitted data.

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POR, 32-33.

25

Eckert's Solution For Reducing Signaling Data

Eckert's Solution: Use Just An Index To A Row In A Table Of Predefined Transport Formats To Signal To The Receiver The Queues From Which The Transmitted Data Originated As Well As The Amount Of Data Being Transmitted From Each Queue.

In Eckert's solution, the mobile radio device selects a transport format for transmission of data on the uplink from a table of transport formats predefined by the base station. Ex. 1005, [0042], [0109], [0201] and [0206].

Each transport format in the table includes predefined data amount(s) from predefined queue(s). *Id.*, [0014], [0028], [0042], [0069], [0102], [0154], [0194] and [0204],

The mobile radio terminal signals the makeup of the transmitted data to the base station by signaling a selected transport format to the base station.

The mobile radio conveys the selected transport by specifying an index to a row in the table of predefined transport formats previously conveyed by the base station. *Id.*, [0235]-[0236]; *see also*, [0051]-[0052].

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POR, 33-34, 35-36.

26

Eckert's Solution For Reducing Signaling Data – Index To Table Of Predefined Transport Formats

TF	PQ #1		PQ #2		PQ #3	
	# of TBs	TB size (bit)	# of TBs	TB size (bit)	# of TBs	TB size (bit)
#1	0	100	0	100	0	100
#2	1	100	0	100	0	100
#3	0	100	1	100	0	100
#4	0	100	0	100	1	100
...	...	...	...	...	...	...
#10	2	200	2	100	0	100
#11	3	200	2	100	1	100
#12	2	300	1	200	2	100
...	...	...	...	...	...	...
#n	5	300	3	300	1	300

[0234] The information regarding how many data packets are transmitted in an MAC-e protocol data unit 607 from which MAC-d flow 301, 302 is indicated in the respectively selected transport format and is described in the table shown above, for example.

[0235] In one alternative embodiment of the invention, the full identifiers are not specified and transmitted in the MAC-e protocol data unit 607 to the mobile radio base station 109, but rather only an index for a row in a table or a pointer to a row in a table which explicitly stores the order and the number of data packets in a respective priority queue 306 and the size thereof.

[0236] In this case, this table is stored both on the terminal and on the network, which means that just one index for the respective table row needs to be written to the control range of the MAC-e protocol data unit 607, which additionally achieves significant savings in terms of bits required in the control data range 608, i.e. in the header field of the MAC-e protocol data unit 607, and still permits explicit coding and decoding of the data on the basis of the MAC-e protocol, i.e. particularly splitting of the multiplexed data over the respective priority queues 306 and the MAC-d flows at the receiver, particularly in the mobile radio base station 109.

POR, 34-36; Ex. 1005, [0204], [0234]-0236].

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27

To Simplify Mapping Of The Data, Eckert Disclosed The Use Of Weighting Values

In order to simplify the mapping of data onto transport channels, Eckert disclosed the use of “weighting values,” which Eckert defined differently than the “priority” of each queue:

Within the context of this description, the priority associated with a priority queue is to be understood to mean the relative or absolute significance of the data buffer-stored in the respective priority queue’s buffer storage.

A weighting value within the context of this description is to be understood to mean an indication of a data transmission bandwidth which is to be respectively allocated, in other words reserved, for reading the data stored in the respective data link layer protocol buffer storage. Ex. 1005, [0062]-[0063] (emphasis added).

Eckert's Use Of Weighting Values

Eckert discloses an embodiment where there are four priority queues A, B, C, D, where each queue is assigned the following weights:

for the first priority queue A 50% of the total available data transmission bandwidth,

for the second priority queue B 30% of the total available data transmission bandwidth,

for the third priority queue C 15% of the total available data transmission bandwidth, and

for the fourth priority queue D 5% of the total available data transmission bandwidth. *Id.*, [0254]-[0258] (emphasis added).

POR, 36-37.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

29

Eckert's System Links The Weights To The Transport Formats

In Eckert, the set of transport format combinations from which the mobile station selects a transport format for each uplink transmission are tied to the weightings used to proportionally allocate the total available transmission bandwidth among the queues. Ex. 1005., [0109] ("the weighting values ... preferably being linked to the respective transport formats").

Thus, when the mobile station proportionally allocates the total available transmission bandwidth among the queues in accordance with the weights, the process results in a combination of data from the queues which corresponds to one of the transport formats available for the mobile terminal to select.

The linkage between the weighting values and the available transport formats is what allows Eckert to use a single index value (corresponding to the selected transport format) transmitted in the header of the MAC-e protocol data unit to signal to the receiver the queue(s) from which the data transmitted originated, as well as the amount of data from each such queue being transmitted. *Id.*, [0051]-[0052], [0081] and [0235]-[0236].

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

POR, 39.

30

Eckert Discloses That The Weightings Need Not Be Explicitly Signalled

[0115] The weightings, i.e. the weighting values, or the weighting value ranges which are assigned to the respective data buffer storages in the data link layer, preferably to the priority queues in the MAC-e subprotocol layer, can be explicitly signalled as a defined percentage of the total available data transmission bandwidths used. Thus, when three data link layer buffer storages are provided, for example, the first buffer storage with the highest priority can be assigned 50%, the data link layer protocol buffer storage with the second highest priority, in other words with medium priority, can be assigned 25%, and the third data buffer storage buffer-storing data with the lowest priority can be assigned 25% of the total available transmission bandwidth.

[0116] The data which are transmitted within a defined time interval via the E-dedicated channel (E-DCH) are in this case made up proportionally from the data which are buffer-stored in the respective data buffer storages, in line with the signalled weighting (the signalled weighting values and the respective data buffer storages' associated data transmission bandwidths which are linked thereto).

[0117] In one advantageous variant, a priority queue buffer storage is provided in the MAC-e subprotocol layer for each data traffic class.

[0118] In this case, the weightings of the data buffer storages in the MAC-e subprotocol layer are not explicitly signalled, but rather the data traffic class is assigned to the weightings of the corresponding priority queues as stipulated previously, and in combination therewith the data transmission bandwidths provided which correspond to the priorities are allocated.

* * *

[0121] By way of example, the weighting values can be assigned to the priority queues on the basis of the data traffic classes such that streaming data are weighted with 40%, conversational data are weighted with 30%, interactive data are weighted with 20% and background data are weighted with 10%. In other words, this means that the streaming data are assigned 40% of the total available data transmission bandwidth, the conversational data are assigned 30%, the interactive data are assigned 20% and the background data are assigned 10%.

POR, 38; Ex. 1005, [0115]-[0118], [0121].

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

31

Like Eckert, Lohr-1's UE Also Selects A Transport Format From A Set Defined By The Base Station

In Lohr-1, “[t]he user equipment autonomously chooses among the allocated transport format combinations based on its own status e.g. available power and buffer status.” Ex. 1007, 3:23-26 (emphasis added).

When the user equipment (UE) wants to send data on the uplink, the “user equipment has to send a request message to the Node B. ... With a grant message sent in the downlink from the Node B to the UE, the Node B assigns the UE” the transport format combination set (TFCS). *Id.*, 7:2-9 (emphasis added).

“The UE selects a suitable TFC from the ‘Node B controlled TFC subset’ ... Any TFC in the ‘Node B controlled TFC subset’ might be selected by the UE, provided there is sufficient power margin, sufficient data available and TFC is not in the blocked state.” *Id.*, 8, 29-32.

Lohr-1 follows an “absolute priority” scheme in which “the MAC may select a TFC from the TFCS, which maximizes the transmission of higher priority data.” *Id.*, 17:14-15.

POR, 39-41.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

32

Lohr-1 Discloses A “Rate Controlled Mode” And A “Time And Rate Controlled Mode”

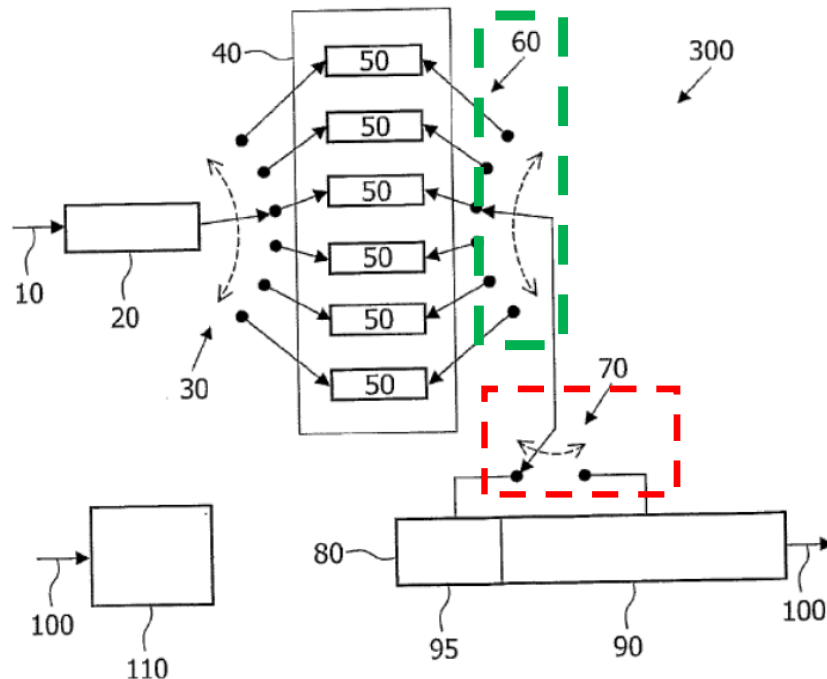
“In the rate controlled mode, UEs are allowed to transmit autonomously up to a maximum data rate, signaled by Node B. ... Since Node B scheduler has no control on the transmission timing of UEs in the rate controlled mode, uplink resources are not explicitly reserved for a UE.” Ex. 1007, 18:15-20 (emphasis added).

“In the time and rate controlled scheduling mode, Node B additionally controls the time when UEs are allowed to transmit.” *Id.*, 18:21-22 (emphasis added).

“Node B controlled time and rate scheduling provides a more precise RoT control compared to the rate-only controlled scheduling as already mentioned before. However this more precise control of the interference at this Node B is obtained at the cost of more signaling overhead and scheduling delay (scheduling request and scheduling assignment messages) compared to rate control scheduling.” *Id.*, 10:25-29 (emphasis added).

Bucknell Discloses An Apparatus For Multiplexing Data

“Data packets are selected for transfer from the queue stores 50 to the output buffer 80 by means of a **second routing means 60** ... and are transferred into the first portion 90 or the second portion 95 by means of a **switch 70**.” Ex. 1006, [0020].



- Bucknell does not disclose *how* the transmitting device signals the receiver with the makeup of the queue(s) from which the data transmitted originated, and the amount of data from each such queue being transmitted.
- Bucknell does not suggest that any of its data selection schemes are linked with predefined transport formats.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

POR, 42-43.

34

The Petition Mapped “A Single Allocation of Uplink Resources” To Eckert’s E-DCH Channel As A Whole

Claim 1 requires that the UE receive “a single allocation of uplink resources” from the network.

The Petition first alleged that this element was met by the totality of Eckert’s “E-DCH channel”:

... Eckert relates to the issue of “how the data about **the new transport channel E-DCH** are to be transmitted via the UMTS air interface.” Ex.1005, [0015]. Data from buffer storages are transmitted in “a defined time interval via the **E-dedicated channel (E-DCH)**.” Ex.1005, [0116] (“The data which are transmitted within a defined time interval via the E-dedicated channel (E-DCH) are in this case made up proportionally from the data which are buffer-storaged in the respective data buffer storages...”). **The allocated E-DCH channel, which is a transport channel and also an uplink channel, Ex.1005, [0012], is an example of a single allocation of uplink resources.** Ex.1003, ¶87.

The ’138 patent confirms that a transport channel is an example of “a single allocation of [] radio resources.” Ex.1001, 9:36-43. Petition, 34-35 (bold in original, underlining added).

The only reason for alleging that “a transport channel is an example of ‘a single allocation of uplink radio resources’” was because the Petition mapped a transport channel (*as a whole*) to “a single allocation of uplink radio resources.”



The Petition Mapped “A Single Allocation of Uplink Resources” To Eckert’s E-DCH Channel As A Whole

Other places where the Petition mapped the single allocation of uplink resources to the E-DCH channel as a whole:

[1.7] select data from the plurality of radio bearers for transmission using the single allocation of uplink resources, wherein the selection of the data occurs using a first iteration and a second iteration,

Eckert combined with Bucknell renders obvious limitation [1.7]. Ex.1003,

¶93.

First, Bucknell describes a selection of data from each of the MAC-d flows for transmission in a MAC-e PDU over E-DCH (*select data ... for transmission using the single allocation of uplink resources*), where, in view of Eckert, it would

Sur-Reply, 3, citing Petition, 36.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

36

The Petition Mapped “A Single Allocation of Uplink Resources” To Eckert’s E-DCH Channel As A Whole

Other places where the Petition mapped the single allocation of uplink resources to the E-DCH channel as a whole:

Both Eckert and Bucknell describe selecting data from a plurality of MAC-d flows (*select data from the plurality of radio bearers*) to fill a single scheduled data unit in the form of a MAC-e PDU for transmission (*for transmission*) over the E-DCH (*using the single allocation of uplink resources*), per the analysis of limitation [1.6]). For example, Eckert discloses that “[t]he MAC-e subprotocol

Sur-Reply, 3, citing Petition, 41.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

37

The Petition Erroneously Argued That The '138 Equated An Entire Transport Channel With "A Single Allocation of Uplink Resources"

Petition

The '138 patent confirms that a transport channel is an example of "*a single allocation of [] radio resources.*" Ex.1001, 9:36-43 ("In this manner, **a single PDP context implies a single CCTrCh. This single physical allocation of radio resources** provided to a UE..."). The abbreviation CCTrCh was understood in the art to refer to a transport channel known as the Coded Composite Transport Channel. Ex.1003, ¶88 (citing Ex.1011, [0021]). Petition, 35 (emphasis in original).

Actual Passage From '138 Patent

If there are multiple QoS requirements within a single 3GPP PDP context, **a single physical allocation of radio resources may be made to the UE.** In this manner, a single PDP context implies a single CCTrCh. **This single physical allocation of radio resources provided to a UE is shared amongst a number of services,** in proportion to their respective QoS requirements, for example in proportion to the signalled weight values (S_{tier}).

The passage from the '138 Patent does not equate a CCTrCh with a single allocation of uplink resources.

The reference to "This single physical allocation of radio resources" in the third sentence of the passage is referring back to "a single physical allocation of radio resources" in the first sentence of the passage.

The '138 Patent does *not* describe a method where the entirety of a CCTrCH (e.g., including infinite time frames and spreading codes) is shared out.

The algorithm in Figure 6 of the '138 Patent would be inoperable if the fractions used to implement the algorithm had infinity in their denominators.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

POR, 46-48; Ex. 1001, 9:36-43.

38

The Reply Alleges That The Petition Mapped A Single Allocation Of Uplink Resources To A Defined Time Interval On The E-DCH

The Petition did not map “a defined time interval” to “a single allocation” of resources:

First, Eckert discloses or renders obvious limitation [1.6]. Eckert explains that mobile radio terminals (UEs) are allocated “resources” by the network and “the protocols of the protocol layers 1 and 2 are configured.” Ex.1005, [0189]. Eckert relates to the issue of “how the data about **the new transport channel E-DCH** are to be transmitted via the UMTS air interface.” Ex.1005, [0015]. Data from buffer storages are transmitted in “a defined time interval” via the E-dedicated channel (E-DCH).” Ex.1005, [0116] (“The data which are transmitted within a defined time interval via the E-dedicated channel (E-DCH) are in this case made up proportionally from the data which are buffer-stored in the respective data buffer storages...”). The allocated E-DCH channel, which is a transport channel and also an uplink channel, Ex.1005, [0012], is an example of a single allocation of uplink resources Ex.1003, ¶87.

Sur-Reply, 3; Reply, 2-3.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

39

The “Single Allocation Of Radio Resources” Allegedly Disclosed In [0116] Of Eckert Requires Signalled Weighting Values Which Are Foreclosed By Petitioner’s Obviousness Theory

Eckert discloses the “defined time interval” only in connection with signalled weighting values which are precluded by Petitioner’s obviousness theory:

The data which are transmitted within a *defined time interval* via the E-dedicated channel (E-DCH) are in this case made up proportionally from the data which are buffer-stored in the respective data buffer storages, *in line with the signalled weighting (the signalled weighting values and the respective data buffer storages associated data transmission bandwidths which are linked thereto)*. Ex. 1005, [0116] (emphasis added).

The Petitioner cannot simultaneously rely on Eckert’s disclosure that data is transmitted *based on* the signaled *weighting* values “within a defined time interval” for the claimed “single allocation of uplink resources,” while at the same time advance a combination of Eckert and Bucknell that *excludes* the use of such weights.

The Petitioner has not provided any explanation why a POSITA would have mixed and matched aspects of different embodiments of Eckert in that manner.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

Sur-Reply, 9-10.

40

The Reply Fails To Explain How “A Defined Time Interval” Equates to “A Single Allocation of Uplink Resources”

Transmitting data “within” a defined time interval at most indicates when a UE has access to the channel – but not the quantum or allocation of radio resources that the UE can share out during that period.

The Reply conflates user “scheduling” with “allocation.” “Scheduling” is the process of deciding which user(s) have access to the channel in a given time slot, while “allocation” involves assigning specific physical-layer resources—such as resource blocks—to each scheduled user.

Absent more information such as, for example, the number of spreading codes allocated to the UE during the time interval, the data rate/power level at which the UE is permitted to transmit during the time interval, and/or the frequency band(s) on which the UE is permitted to transmit during the time interval, the UE has not received sufficient information necessary to indicate a single allocation of radio resources, i.e., a quantum of radio resources that can be shared out.

The Reply (at 5) alleges that “there are only a finite number of spreading codes employed on Eckert’s E-DCH channel.” However, Eckert does not disclose which ones of those codes are allocated to a given UE during the “defined time interval.”

Sur-Reply, 4-5.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

41

Petitioner Never Explains How Providing A UE With ***Multiple Data Quantity Options*** Equates To Providing The UE With “A ***Single*** Allocation Of Uplink Resources”

In Eckert, the UE autonomously chooses among the allocated transport format combinations.

TF	PQ #1		PQ #2		PQ #3	
	# of TBs	TB size (bit)	# of TBs	TB size (bit)	# of TBs	TB size (bit)
#1	0	100	0	100	0	100
#2	1	100	0	100	0	100
#3	0	100	1	100	0	100
#4	0	100	0	100	1	100
...	...	...	...	...	...	...
#10	2	200	2	100	0	100
#11	3	200	2	100	1	100
#12	2	300	1	200	2	100
...	...	...	...	...	...	...
# n	5	300	3	300	1	300

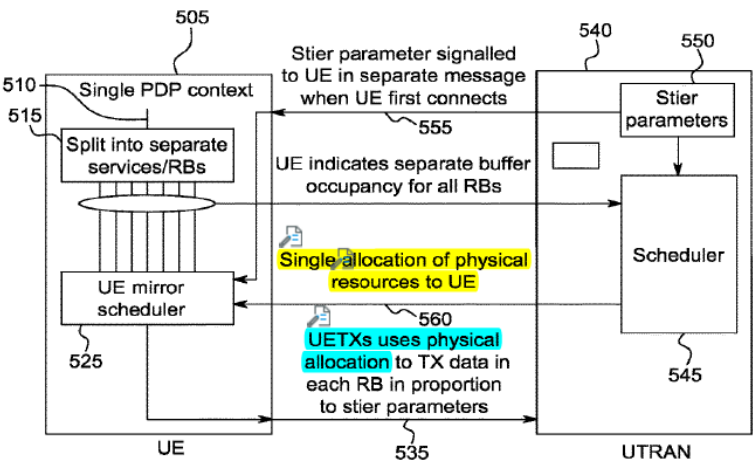
The Petition fails to explain how providing the UE with multiple data quantity options for transmitting data in a TTI equates to providing the UE with “a single allocation of uplink resources” from the network.

POR, 51-52.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

42

The Claim Language Requires That The UE Both **Receive** “A Single Allocation Of Uplink Resources” And Then **“Select Data”** For Transmission **“Using The Single Allocation”**



A user equipment (UE) comprising:
a processor communicatively coupled to a transmitter and circuitry configured to receive; and
the processor is configured to: ...
cause the circuitry to receive a single allocation of uplink resources,
select data from the plurality of radio bearers for transmission using the single allocation of uplink resources, wherein the selection of the data occurs using a first iteration and a second iteration,

‘138 Patent, 9:53-57: the UE “takes the single physical allocation and splits it between different RBs using...”

‘138 Patent, 10:23-28: “within the UE 505 ... the overall resources allocated by the network are now split up based on the relative values of W’tier.”

In the ‘138 Patent, the UE uses the single allocation (FreeRAAU) as inputs to equations used to select a data quantity from each queue:

$$RAAU_q = (FreeRAAU) * W_q \quad \blacksquare \quad RAAU_q'' = round[(FreeRAAU)W_q'']$$

Sur-Reply, 8-9.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

Lohr-1's Scheduling Modes Fail To Teach Providing The UE With A Single Allocation Of Uplink Resources

"In the rate controlled mode, UEs are allowed to transmit autonomously up to a maximum data rate, signaled by Node B. ... Since Node B scheduler has no control on the transmission timing of UEs in the rate controlled mode, uplink resources are not explicitly reserved for a UE." Ex. 1007, 18:15-20 (emphasis added).

"In the time and rate controlled scheduling mode, Node B additionally controls the time when UEs are allowed to transmit." *Id.*, 18:21-22 (emphasis added).

However, even in that mode, "[t]he user equipment is allowed to autonomously choose among the allocated transport format combinations based on its own status e.g. available power and buffer status." *Id.*, 3:23-26 (emphasis added); 7:5-8, 8:22-9:3 ("Any TFC in the 'Node B Controlled TFC subset' might be selected by the UE ...")

"Node B controlled time and rate scheduling provides a more precise RoT control compared to the rate-only controlled scheduling as already mentioned before. However this more precise control of the interference at this Node B is obtained at the cost of more signaling overhead and scheduling delay (scheduling request and scheduling assignment messages) compared to rate control scheduling." *Id.*, 10:25-29 (emphasis added).

The Petition's Purported Rationales For Combining Eckert And Bucknell

The Petition advanced two purported motivations why a POSITA would have combined Eckert and Bucknell.

First, the Petition argued that a POSITA would have been motivated to make the proposed combination in order to eliminate the need for “sending weighting values from a base station to a UE, as is done in Eckert, ... thus beneficially achieving reducing control signaling overhead compared to Eckert’s techniques.” Petition, 52.

The Petition’s second alleged reason why a POSITA would be motivated to do away with Eckert’s weightings is to “reduce complexity ... by avoiding the use of calculations that involve selecting data from queues in proportion to weighting values.” *Id.*

POR, 59-60; Sur-Reply, 14-15 and 17.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

45

The Petition's Proposed Exclusion Of Weightings From Eckert Would Render Eckert *Inoperable* For Its Primary Purpose Of Reducing Signaling Overhead

In order to reduce the signalling overhead, Eckert proposed a solution based on the use of "weighting values" for proportionally mapping data from queues to the transport channels based on weights. *Id.*, [0062]-[0063] and [0254]-[0258].

Eckert then tied the set of transport format combinations from which the mobile station selects a transport format to the weightings used to proportionally allocate the total available transmission bandwidth among the queues. *Id.*, [0109].

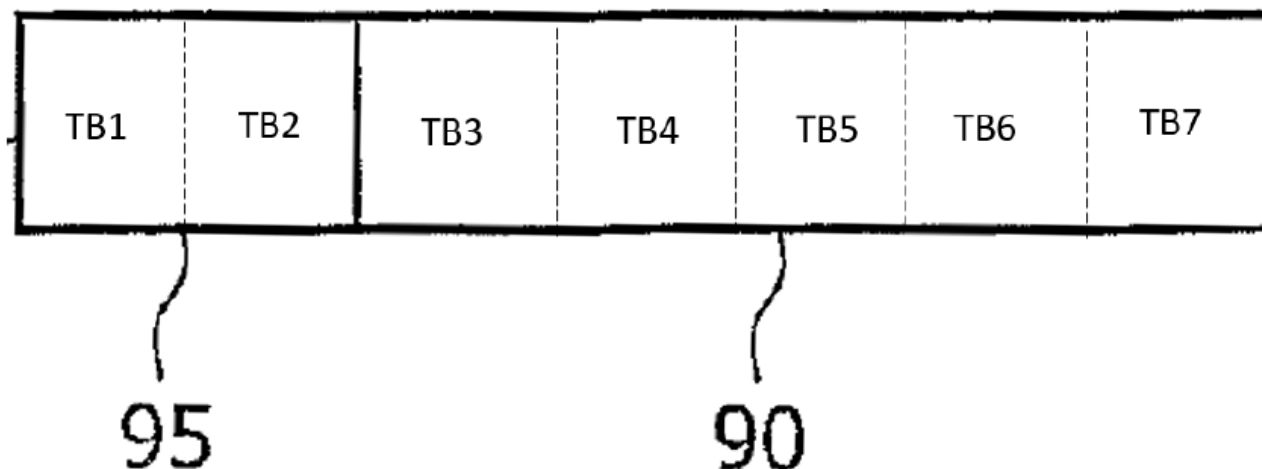
Thus, in Eckert, when the mobile station proportionally allocates the total available transmission bandwidth among the queues in accordance with the weights, the process results in a combination of data from the queues which corresponds to one of the transport formats available for the mobile terminal to select.

The linkage between the weighting values and the available transport formats is what allows Eckert to reduce signaling overhead by using a single index value (corresponding to the selected transport format) transmitted in the header to signal the makeup of the transmitted data to the receiver.

Doing away with Eckert's weightings would have thwarted Eckert's ability to use a single index value (corresponding to the selected transport format) to signal the makeup of the transmitted data to the receiver.

The Petition's Proposed Combination Of Eckert With Bucknell Would Have Drastically Increased Signaling Overhead

Consider a scenario (illustrated below) where Bucknell's "second portion 95" is mapped to two transport blocks (TB1 and TB2) and Bucknell's "first portion 90" is mapped to five transport blocks (TB3-TB7).



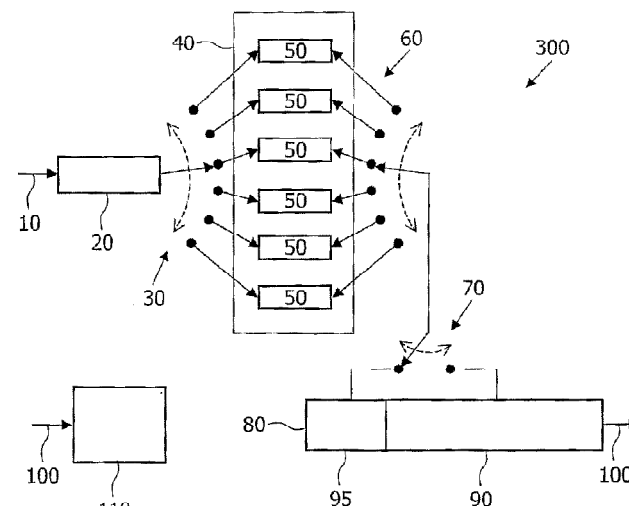
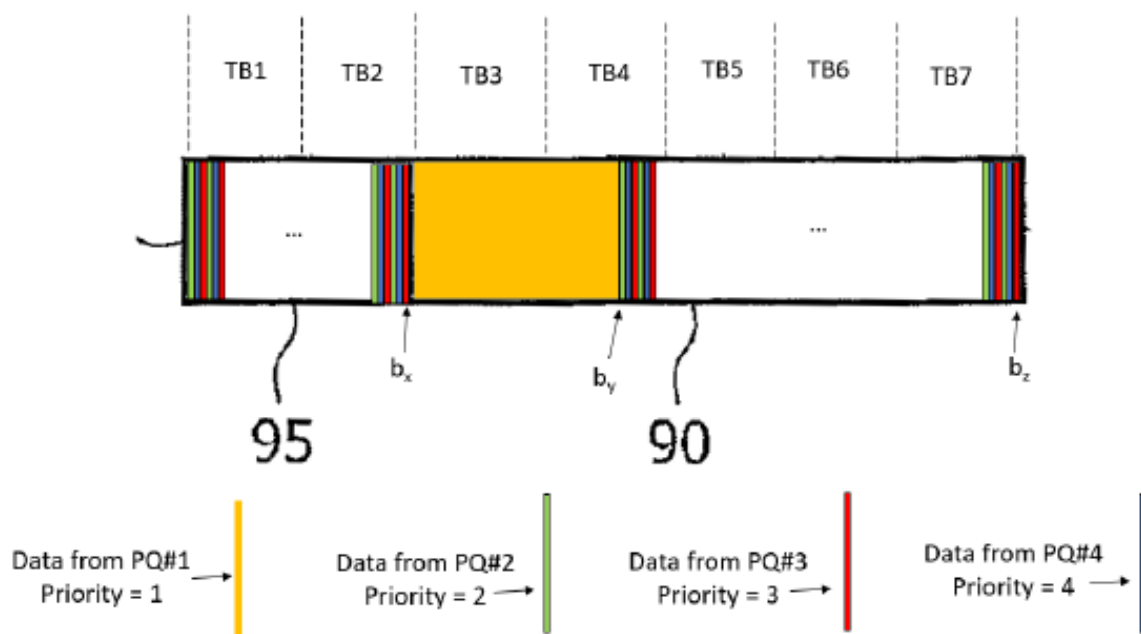
"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

47

Illustration Of Bucknell's Examples 1-3 With Four Queues

Bucknell's "first portion 90" is partially filled using data packets from the highest-priority queue (PQ#1 - shown in orange) but there is insufficient data in the highest-priority queue (PQ#1) to fully fill the first portion 90.

Next, "the second portion 95 is populated by taking one data packet in turn from each of the subset of queues" (which results in interleaving of data from the subset of queues) followed by making the unused resource from the first portion 90 "available for the second portion 95."



"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

48

POR, 56-58; Sur-Reply, 22.

The Petition's Proposed Combination Of Eckert With Bucknell Would Have Drastically Increased Signaling Overhead

The quantity of signaling data when transmitting data populated into the “first portion 90” and the “second portion 95” using Bucknell’s Examples 1-3 would be “enormous,” especially compared to Eckert’s solution which conveyed the makeup of the data being transmitted with a *single* index value.

Given the myriad of possible ways that the first and second portions could be filled with data from the different queues using Examples 1-3 of Bucknell, it would be impractical to link a defined set of predefined transport format combinations to all of the possible allocation outcomes that could be produced.

Absent from the Reply is any explanation of how a POSITA could link each of a limited set of predefined transport format combinations (as taught in Eckert) to one of the vast number of potential combinations in which the first and second portions in Bucknell could be filled with data from the different queues.

The Reply (at 19) makes only the conclusory allegation that “Eckert’s solution of using a single index to a row in a table of transport format combinations applies to signal the resulting PDU contents [of Bucknell’s selection methods] to the base station.” That conclusory allegation is insufficient to explain how such a result could be accomplished.

POR, 58; Sur-Reply, 21-22.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

49

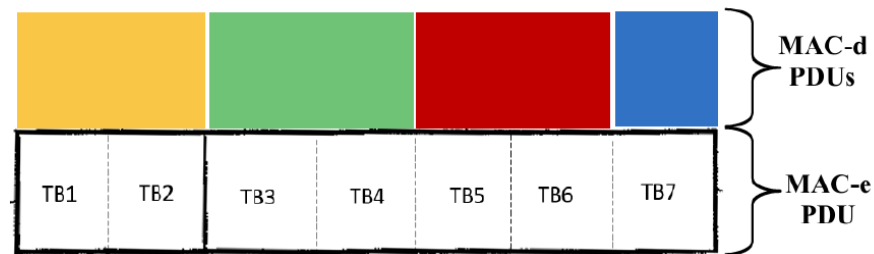
The Proposed Combination Of Eckert With Bucknell Would Have Drastically Increased Overhead

The Reply (at 21-23) suggests a POSITA would have rearranged the interleaved and fragmented data resulting from Bucknell's techniques into a more simple arrangement.

That argument is outside the scope of the references in the instituted grounds which do teach such rearrangement.

Moreover, even if the data were rearranged, the respective quantities of data from each queue would still fail to map neatly to one of a limited set of transport formats as required by Eckert.

The Reply merely posits without explanation that the interleaved and fragmented data resulting from Bucknell's Examples 1-3 could be rearranged such that the quantities of data from Queues 1, 2 and 3 each occupy exactly two transport blocks, while the data from Queue 4 occupies exactly one transport block, as shown below.



The Reply fails to explain how Bucknell's process of populating "the second portion 95 ... by taking one data packet in turn from each of the subset of queues," followed by making the unused resource from the first portion 90 available for the second portion 95," followed by "rearrangement," would magically result in quantities of data from each queue that align perfectly with the transport block boundaries.

POR, 58; Sur-Reply, 21-23.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

50

The Petition's Purported Rationales For Combining Eckert And Bucknell Do Not Withstand Scrutiny

Purported Rationale #1: First, the Petition argued that a POSITA would have been motivated to make the proposed combination in order to eliminate the need for “sending weighting values from a base station to a UE, as is done in Eckert, ... thus beneficially achieving reducing control signaling overhead compared to Eckert's techniques.” Petition, 52.

- Eckert already includes embodiments where the weightings “are not explicitly signalled” but rather are assigned based on traffic class. Ex. 1005, [0107], [0115] and [0118].
- A POSITA motivated to eliminate the sending of weighting values from the base station to a UE would not have needed to look beyond Eckert itself to accomplish that goal.
- Eliminating the weightings from Eckert would have increased signalling overhead by destroying the linkage between the weightings and the predefined set of transport formats used to convey the data makeup with single index value.
- At most, Eckert required the weightings to be transmitted from the base station to the UE at set-up time. The bandwidth required to transmit the weights once at set-up pales in comparison to the additional signaling overhead that would be required in the control header for every data transmission if Eckert's weighting methodology were tossed aside in favor of any of the examples from Bucknell.

POR, 60-61; Sur-Reply, 16.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

51

The Petition's Purported Rationales For Combining Eckert And Bucknell Do Not Withstand Scrutiny

Purported Rationale #2: The Petition's other rationale was that a POSITA would have been motivated to combine Eckert with Bucknell in order to "reduce complexity ... by avoiding the use of calculations that involve selecting data from queues in proportion to weighting values." Petition, 52.

- There is no need for the UE in Eckert to do any "calculations" to determine the amount of data associated with each weighting value because, in Eckert, the results of such calculations are already "baked into" the pre-defined transport formats provided by the base station to the UE. *See*, Eckert at [0204].
- The fraction of a clock cycle of processing required to multiply an available bandwidth quantity by an allocation percentage is so trivial that it would not motivate a POSITA to do away with the benefits of Eckert's ability to use a single index value to signal the makeup of the transmitted data to the receiver.
- A POSITA would toss aside the intended purpose of Eckert, or at the very least, engage in a substantial redesign of Eckert to substitute a priority based allocation methodology for Eckert's weighting-based system, in order to save a fraction of a clock cycle.

POR, 61-62.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

52

The Petition Did Not Articulate A Coherent Theory Where Data Was Retrieved From Eckert's Radio Bearers Based On Priorities Of The Data

In connection with Elements [1.4]-[1.5], the Petition (at 31-33) mapped the claimed “plurality of radio bearers” to “each radio bearer” disclosed in the background section of Eckert at [0011].

In the Detailed Description, Eckert refers to such radio bearers as “radio bearers (RB) 210.” Ex. 1005, [0149], [0156], [0163].

However, in connection with Elements [1.7]-[1.8] – which recite steps where data is selected from “the plurality of radio bearers” -- the Petition (at 36-38, 41-43, 45) switched its mapping of the claimed radio bearers from Eckert's radio bearers to Eckert's “MAC-d flows” which are not the same.

The Reply (at 10-13) argues that Patent Owner ignored an alternative theory espoused in the Petition which relied on Eckert's “priorities” (rather than weightings) to select data from the claimed radio bearers. However, the Petition never espoused a cohesive theory that Eckert used “priorities” to select data from Eckert's radio bearers 210 (mapped to the claimed “plurality of radio bearers” in Elements [1.4] and [1.5]).

The “priorities” disclosed in [0228] of Eckert and relied on by Petitioner for its “alternate theory” are used to select data from Eckert's “priority queues 306” which are not the same as Eckert's radio bearers 210.

Sur-Reply, 11-12.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

53

The Petition Did Not Articulate A Coherent Theory Where Data Was Retrieved
From Eckert's Radio Bearers Based On Priorities Of The Data

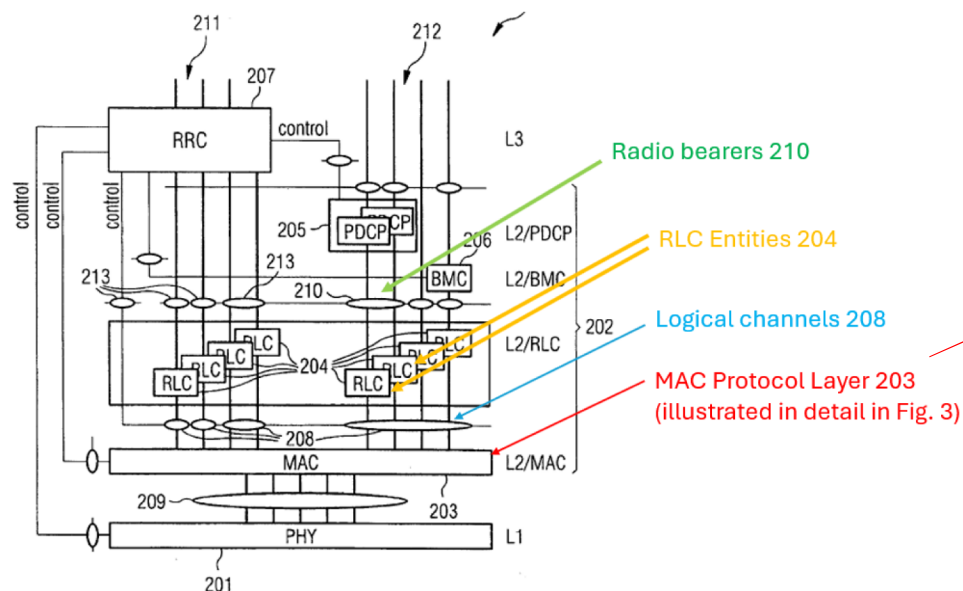
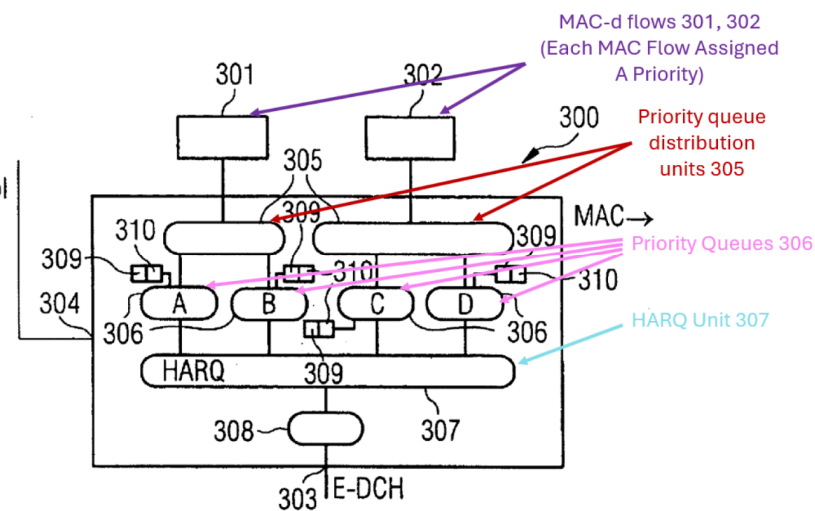


FIG 3

MAC Control



[0228] To set up the MAC-e protocol data unit 607, the HARQ unit 307 retrieves, i.e. reads, the data from the various priority queues 306 according to particular criteria, such as the priorities of the data or the weightings or weighting value ranges transmitted using an RRC message, as explained in more detail below, for the individual priority queues 306. This is done on the basis of the respective transport format selected using the transport format selection unit 308 (TF selection).

Sur-Reply, 12-13.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

54

Petitioner's New Obviousness Theory Set Forth In The Reply Must Be Rejected

The Reply (at 24-25) advances for the first time a new obviousness theory that “Bucknell and Eckert both address the problem of how to fill a MAC-e PDU from various MAC-d queues” and “Petitioner has demonstrated that Bucknell teaches a suitable option for addressing the same problem as in Eckert, which demonstrates obviousness” under *Intel Corp. v. Qualcomm Inc.*, 21 F. 4th 784, 800 (Fed. Cir. 2021).

This is a new theory which must be rejected because it was not set forth in the Petition and it would be prejudicial to Patent Owner to allow the Petitioner to wait to advance a new theory until the point in the proceedings where the Patent Owner is precluded from responding with testimony from Patent Owner's own expert.

Sur-Reply, 18-19.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

55

Petitioner's New Obviousness Theory Set Forth In The Reply Must Be Rejected

The new theory must be rejected because the Petitioner has failed to demonstrate that Bucknell “teaches a *suitable* option for address[ing] the same problem as in Eckert.” Reply, 24-25.

Rather than being suitable for Eckert, replacing Eckert's weightings with the relied-on techniques from Bucknell would have rendered Eckert inoperable for its intended purpose.

The new theory also fails to align with the other mappings set forth in Petition.

- In connection with Elements [1.4]-[1.5], the Petition (at 31-33) mapped the claimed “plurality of radio bearers” to the radio bearers mentioned in the background section of Eckert at [0011] and referred to as “radio bearers (RB) 210.” In Elements [1.7]-[1.8], the Petitioner was required to demonstrate that, in the proposed combination, data from those same radio bearers was selected.
- Even if “Bucknell and Eckert both address the problem of how to fill a MAC-e PDU from various MAC-d queues,” that fact does not meet Petitioner's burden of demonstrating that the proposed combination would have selected data from the same radio bearers identified by the Petition in connection with Elements [1.4]-[1.5], because the “various MAC-d queues” that both Eckert and Bucknell purportedly use to fill a MAC-e PDU are not one and the same as Eckert's radio bearers 210.

Sur-Reply, 18-20.

"DEMONSTRATIVE EXHIBIT - NOT EVIDENCE"

56