

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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Title: METHODS AND ARRANGEMENTS IN A  
TELECOMMUNICATIONS NETWORK

**DECLARATION OF DR. ROBERT AKL, D.Sc.**

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1.	“[sending / receiving]... information on which of the uplink component carriers the timing correction is valid for to the user equipment” (independent claims 1, 13, 18, 30) .....	35
2.	“determining for which of the uplink component carriers used by the user equipment the determined timing correction is valid” (independent claims 1 and 18) .....	36
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1.	“A method that facilitates a timing alignment in a multicarrier system, the method comprising” .....	38

2.	“determining different downlink timings associated with a plurality of downlink carriers” .....	38
3.	“ascertaining an uplink timing associated with an uplink group of carriers including a first uplink carrier and a second uplink carrier,” .....	39
4.	“wherein the uplink timing is ascertained based on a processing of at least one downlink timing of the different downlink timings and” .....	39
5.	“a timing offset associated with the uplink group of carriers, and the at least one downlink timing of the different downlink timings; and.....	39
6.	“transmitting on the first uplink carrier at the uplink timing adjusted based on the timing offset associated with the at least one downlink timing of the different downlink timings, and on the second uplink carrier at the adjusted uplink timing.” .....	40
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	[1.0] A method in a base station for determining an uplink transmission timing correction for communication in a telecommunication system in which aggregation of component carriers is applied, the method comprising: .....	46
	[1.1] receiving a signal on a selected uplink component carrier from a user equipment;.....	47
	[1.2] measuring an arrival time of the received signal; .....	48
	[1.3] determining a timing correction of the uplink transmission timing based on the measured arrival time; .....	50

[1.4] determining for which of the uplink component carriers used by the user equipment the determined timing correction is valid; and.....	52
[1.5] sending the timing correction and information on which of the uplink component carriers the timing correction is valid for to the user equipment.....	53
[2.0] The method according to claim 1, wherein the determination for which of the uplink component carriers the determined timing correction is valid is based on a downlink timing reference associated with the respective uplink component carrier. ....	54
[3.0] The method according to claim 2, wherein the timing correction is determined to be valid for the uplink component carrier which has an associated downlink timing reference aligned with the downlink timing reference associated with the selected uplink component carrier.....	55
[4.0] The method according to claim 3, wherein the downlink timing reference is a synchronization signal or reference signal of one downlink component carrier. ....	55
[5.0] The method according to claim 2, wherein the timing correction is determined to be valid for the uplink component carrier which has an associated downlink timing reference with a defined offset relative to the downlink timing reference associated with the selected uplink component carrier.....	56
[6.0] The method according to claim 2, wherein the downlink timing references are synchronization signals or reference signals on different downlink component carriers. ....	57
[7.0] The method according to claim 1, wherein the timing correction is determined to be valid for only the selected uplink component carrier when the component carriers are time division duplex carriers with different downlink or uplink allocations across the carriers.....	57

[8.0] The method according to claim 1, wherein the information on which uplink component carrier the timing correction is valid for is configured via Radio Resource Control (RRC) signaling. ....	58
[9.0] The method according to claim 1, wherein the information on which uplink component carrier the timing correction is valid for is signaled with Medium Access Control (MAC) control elements.....	58
[10.0] The method according to claim 1, wherein the timing correction is sent in a timing advance command.....	59
[11.0] The method according to claim 1, wherein a message comprising both the timing correction and information on which of the uplink component carriers the timing correction is valid for is sent to the user equipment via Radio Resource Control (RRC) or Medium Access Control (MAC) control elements. ....	59
[12.0] The method according to claim 1, wherein determining the timing correction of the uplink transmission timing is also based on an arrival time reference. ....	60
[13.0] A method in a user equipment for determining an uplink transmission timing correction for communication in a telecommunication system in which aggregation of component carriers is applied, the method comprising: .....	60
[13.1] sending a signal on an uplink component carrier to a base station;.....	61
[13.2] receiving, from the base station, a timing correction of the uplink transmission timing and information on which uplink component carriers in the aggregation of component carriers the timing correction is valid for; and.....	62
[13.3] adjusting the uplink transmission timing of the uplink component carriers in the aggregation of	

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