

U.S. Patent No. 10,924,500 Claim Listing

No.	Limitation
1[p]	A system comprising:
1[a]	a telecommunications network configured to identify mobile telecommunications device and comprising a core network and a base station,
1[b]	wherein the base station is configured to receive radio signals from the mobile telecommunications device and further process the radio signals into processed signals and to transmit the processed signals to the core network,
1[c]	wherein the telecommunications network is arranged to count in the core network a number of occurrences of a certain predetermined signal associated with the mobile telecommunications device,
1[d]	the certain predetermined signal representing an interaction between network devices in the core network for normal processing of signals,
1[e]	and wherein the telecommunications network is further arranged to register when the number of occurrences of the certain predetermined signal exceeds a level indicating acceptable behaviour of the mobile telecommunications device in the telecommunications network,
1[f]	wherein the certain predetermined signal indicates handover of the mobile telecommunications device.
2[a]	The system according to claim 1, wherein the telecommunications network is arranged to count in the core network the number of occurrences of the certain predetermined signal by counting a number of times occurrence of the certain predetermined signal is detected when the number of occurrences exceed a predetermined temporal rate,
2[b]	and wherein the telecommunications network is further arranged to register when the number of times the occurrence of the certain predetermined signal detected exceeds a predetermined threshold.

3	The system according to claim 2, wherein the telecommunications network is arranged to count the number of occurrences of the certain predetermined signal when a time between a detected occurrence and a previously detected occurrence is within a predetermined time interval.
4[a]	The system according to claim 3, wherein the telecommunications network includes a counter and a timer,
4[b]	and wherein the telecommunications network is arranged to start the counter upon detection of the occurrence and further to start the timer,
4[c]	and wherein the telecommunications network is further arranged to increase the counter by one unit if a following occurrence is within the predetermined time interval as measured by the timer.
5	The system according to claim 1, wherein the telecommunications network is further configured to detect when the number of occurrences of the certain predetermined signal exceeds a predetermined rate.
6[a]	The system according to claim 5, wherein the telecommunications network includes a counter and a timer,
6[b]	and wherein the telecommunications network is arranged to start the counter upon detection of the occurrence and further to start the timer,
6[c]	and wherein the telecommunications network is further arranged to calculate a rate as a ratio of a counted number of detected occurrences to time as measured by the timer.
7	The system according to claim 1, wherein the telecommunications network is arranged to register when the number of occurrences of the certain predetermined signal exceeds the level for acceptable behaviour by setting a flag and/or starting a back off.
8[a]	The system according to claim 1, wherein the telecommunications network is further arranged to monitor a tracking area of the mobile telecommunications device
8[b]	and to register the number of occurrences of the certain predetermined signal only when the monitoring of tracking area

	shows that the mobile telecommunications device remains within a single tracking area.
9	The system according to claim 1, wherein the telecommunications network is arranged to count the number of occurrences of the certain predetermined signal in a Mobility Management Entity or Serving Gateway Support Node or Mobile Switching Center of the telecommunications network.
10[p]	The system according to claim 1, wherein the telecommunications network is further configured to:
10[a]	identify at least one additional mobile telecommunications device,
10[b]	receive radio signals from the at least one additional mobile telecommunications device and to process these radio signals into processed signals and to transmit the processed signals to the core network,
10[c]	count in the core network a number of occurrences of a certain predetermined signal associated with the at least one additional mobile telecommunications device, the certain predetermined processed signal representing an interaction between network devices for normal processing of signals
10[d]	register when the number of occurrences of a certain predetermined signal associated with the at least one additional mobile telecommunications device exceeds a level indicating acceptable behaviour of the at least one additional mobile telecommunications device within the telecommunications network,
10[e]	wherein the telecommunications network is further arranged to aggregate registered data of the mobile telecommunications device and the at least one additional mobile telecommunications device,
10[f]	and wherein the certain predetermined signal associated with the at least one additional mobile telecommunications device indicates handover of the at least one additional mobile telecommunications device.
11[p]	A method for detecting behaviour of a mobile telecommunications device in a telecommunications network comprising a core network,

	the telecommunications network including a base station, the method comprising:
11[a]	at the base station, receiving radio signals from the mobile telecommunications device, and processing the radio signals into processed signals and transmitting the processed signals to the core network;
11[b]	in the telecommunications network, identifying the mobile telecommunications device;
11[c]	the telecommunications network counting, in the core network, a number of occurrences of a certain predetermined signal associated with the mobile telecommunications device,
11[d]	the certain predetermined signal representing an interaction between network devices in the core network for normal processing of signals; and
11[e]	registering when the number of occurrences of the certain predetermined signal exceeds a level indicating acceptable behaviour of the mobile telecommunications device in the telecommunications network,
11[f]	wherein the certain predetermined signal indicates handover of the mobile telecommunications device.