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Invalidity of U.S. Patent No. 9,184,881

'881 Patent	Reference
1[pre] A method for feeding back confirmation information on a physical uplink shared channel, which is used for enabling a user equipment to feed back to an eNodeB whether data of a downlink sub-frame is correctly received in a situation that a number of the downlink sub-frames is greater than a number of uplink sub-frames in a time division duplex system, wherein the method comprises:	U.S. Patent Publication No. 2008/0253318 to Malladi at Abstract, [0005], [0008]-[0010], [0029], [0038]
	U.S. Patent No. 7,774,686 to Anh at Abstract, 2:19-32, 2:33-46, 2:53-67, 3:3-8, 10:5-14, 10:15-24, Fig. 8
	Chinese Patent No. 1295897C to Hao at Abstract, Pages 1-2
	U.S. Patent No. 8,281,204 to Hu at Abstract, 2:13-29, 4:52-5:22, 6:54-60, 9:27-31, Fig. 2
	U.S. Patent Publication No. 2008/0095252 to Kim at Abstract, [0010], [0011], [0030], [0105], [0133]
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 1-2, 9, Fig. 1
	3GPP TS 36.212 V8.2.0 (2008-03) at Section 5.2.3.1, Figure 5.2.2.-1
1[a] the eNodeB carries, in downlink control information, a number value of the downlink sub-frame corresponding to the confirmation information which is fed back by one uplink sub-frame, and transmits data on a plurality of continuous downlink sub-frames after the sub-frame carrying the downlink control information, wherein the number of the downlink sub-frames which transmit the data is equal to a number of the downlink sub-frames corresponding to the confirmation information fed back by the one uplink sub-frame;	3GPP TS 36.213 V8.2.0 (2008-03) at Section 10.3
	U.S. Patent Publication No. 2008/0253318 to Malladi at Abstract, [0007], [0012], [0032], [0033], [0038], [0061], Figs. 2, 3, 10
	U.S. Patent No. 7,774,686 to Anh at 3:9-19, 4:5-21, 6:3-12, 7:36-51, 8:2-12, 10:5-14, 10:15-24, Figs. 5, 8, Table 1
	Chinese Patent No. 1295897C to Hao at Pages 4-5
	U.S. Patent No. 8,281,204 to Hu at 2:13-42, 4:43-62, 8:55-9:20, Fig. 3
	U.S. Patent Publication No. 2008/0095252 to Kim at Abstract, [0011], [0020], [0027]-[0031]
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 1-2, 9, Fig. 1, Table 1
1[b] after the user equipment receives the downlink sub-frame which carries the downlink control information, the data is received from the downlink sub-frame which transmits the data	3GPP TS 36.212 V8.2.0 (2008-03) at Section 5.2.3.1, Figure 5.2.2.-1
	3GPP TS 36.213 V8.2.0 (2008-03) at Section 10.3
	U.S. Patent Publication No. 2008/0253318 to Malladi at [0032], [0033], [0036]-[0038], Figs. 2, 3
	U.S. Patent No. 7,774,686 to Anh at 3:9-19, 4:5-21, 6:3-12, 7:36-51, 8:2-12, 10:5-14, 10:15-24, Figs. 5, 8, Table 1

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after this downlink sub-frame, and the confirmation information of receiving the data is fed back together with uplink data to the eNodeB through a physical uplink shared channel through an uplink sub-frame;	Chinese Patent No. 1295897C to Hao at Pages 4-5, Fig. 1
	U.S. Patent No. 8,281,204 to Hu at 4:65-5:22, 8:55-9:20, Fig. 3
	U.S. Patent Publication No. 2008/0095252 to Kim at [0025], [0032]-[0035]
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 1-2, 9, Fig. 1
	3GPP TS 36.212 V8.2.0 (2008-03) at Section 5.2.3.1, Figure 5.2.2.-1
	3GPP TS 36.213 V8.2.0 (2008-03) at Section 10.3
1[c] wherein, in a situation that the user equipment feeds back a plurality of groups of the confirmation information, an amount of the confirmation information fed back in each group is equal to a maximum number of codeword streams in this downlink sub-frame, and respective confirmation information in each group corresponds to the confirmation information of the codeword stream of a corresponding downlink sub-frame;	U.S. Patent Publication No. 2008/0253318 to Malladi at [0032], [0033], [0036]-[0038], [0092], [0093]-[0095], [0099], [0100], [0101], [0105], [0110], Figs. 2, 3, 6-8
	U.S. Patent No. 7,774,686 to Anh at 3:41-54, 3:55-4:4, 10:33-48, 10:48-52, 15:65-67, 16:1-17:11, Figs. 11, 12
	Chinese Patent No. 1295897C to Hao at Pages 4-5, Fig. 1
	U.S. Patent No. 8,281,204 to Hu at 5:7-22, 6:3-19, 6:54-7:47, 9:22-10:34, Fig. 2
	U.S. Patent Publication No. 2008/0095252 to Kim at [0028], [0105], [0107], [0108], [0110]-[0114], [0118]-[0120], [0128], [0129], Figs. 10B, 11, 12
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 2-6, 8, Figs. 2-3, Table 2
	3GPP TS 36.212 V8.2.0 (2008-03) at Section 5.2.3.1, Figure 5.2.2.-1
	3GPP TS 36.213 V8.2.0 (2008-03) at Section 10.3
1[d] in the situation that the number of codeword streams of the downlink sub-frames is smaller than the maximum number of the codeword streams of the downlink sub-frame, the user equipment feeds back the confirmation information of the number of the maximum codeword streams, wherein confirmation information without a corresponding codeword stream is set as a predefined fixed value;	U.S. Patent Publication No. 2008/0253318 to Malladi at [0032], [0033], [0036]-[0038], [0092], [0093]-[0095], [0099], [0100], [0105], [0110], Figs. 2, 3, 6-8
	U.S. Patent No. 7,774,686 to Anh at 3:41-54, 3:55-4:4, 10:33-48, 10:48-52, 15:65-67, 16:1-17:11, Figs. 11, 12
	Chinese Patent No. 1295897C to Hao at Pages 4-5, Fig. 1
	U.S. Patent No. 8,281,204 to Hu at 5:7-22, 6:3-19, 6:54-7:47, 9:22-10:34, Fig. 2
	U.S. Patent Publication No. 2008/0095252 to Kim at [0028], [0105], [0107], [0108], [0110]-[0114], [0118]-[0120], [0128], [0129], [0132], Figs. 10B, 11, 12
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 2-6, 8, Figs. 2-3, Table 2

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	3GPP TS 36.212 V8.2.0 (2008-03) at Section 5.2.3.1, Figure 5.2.2.-1
	3GPP TS 36.213 V8.2.0 (2008-03) at Section 10.3
1[e] when the user equipment fails to detect the physical downlink control channel corresponding to the transmitted data in the sub-frame which transmits the data, the user equipment feeds back the negative acknowledgement message as the confirmation information of each codeword stream in a group corresponding to this downlink sub-frame.	U.S. Patent Publication No. 2008/0253318 to Malladi at [0032], [0033], [0036]-[0038], [0092], [0093]-[0095], [0099], [0100], [0101], [0105], [0110], Figs. 2, 3, 6-8
	U.S. Patent No. 7,774,686 to Anh at 3:41-54, 3:55-4:4, 10:33-48, 10:48-52, 15:65-67, 16:1-17:11, Figs. 11, 12
	Chinese Patent No. 1295897C to Hao at Pages 4-5, Fig. 1
	U.S. Patent No. 8,281,204 to Hu at 5:7-22, 6:3-19, 6:54-7:47, 9:22-10:34, Fig. 2
	U.S. Patent Publication No. 2008/0095252 to Kim at [0011], [0020], [0025], [0028], [0105], [0107], [0108], [0110]-[0114], [0118]-[0120], [0128], [0129], Figs. 10B, 11, 12
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 2-6, 8, 9, Figs. 2-3, Table 2
	3GPP TS 36.212 V8.2.0 (2008-03) at Section 5.2.3.1, Figure 5.2.2.-1
	3GPP TS 36.213 V8.2.0 (2008-03) at Section 10.3
2. The method according to claim 1, wherein the eNodeB uses a signaling in the downlink control information for representing an index of the uplink sub-frame for transmitting uplink data in the situation that the number of the downlink sub-frames is smaller than the number of the uplink sub-frames to carry the number of the downlink sub-frames corresponding to the confirmation information which is fed back by the one uplink sub-frame.	The support above for claim 1
	U.S. Provisional Application No. 61/086,834 to Shen at Page 1, Fig. 1, Table 1
3. The method according to claim 1, wherein the eNodeB determines a set of number values of all the downlink sub-frames corresponding to information which is fed back by the one uplink sub-frame according to a configuration pattern	The support above for claim 1

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for the current number of downlink/uplink sub-frames, and selects corresponding number values from the set according to an amount of the data actually required to be transmitted to be carried in the downlink control information.	
4. The method according to claim 1, wherein the eNodeB sends a control signaling associated with the allocation of the physical uplink shared channel on a first downlink sub-frame in the downlink sub-frames corresponding to the confirmation information fed back by the uplink sub-frame.	The support above for claim 1
5. The method according to claim 1, wherein in the uplink sub-frames fed back to the eNodeB, the user equipment, according to the order of serial numbers of the received downlink sub-frames which transmit the data, receives each downlink sub-frame which transmits the data and feeds back corresponding confirmation information.	The support above for claim 1
6. The method according to claim 1, wherein in a situation that the user equipment fails to receive the data of in the sub-frame, the user equipment feeds back a negative acknowledgement message as the confirmation information of this downlink sub-frame; in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-frame transmitting the data, the user equipment analyzes the data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a	The support above for claim 1
	U.S. Patent Publication No. 2008/0253318 to Malladi at Abstract, [0007], [0030], [0038], [0092], [0094], Fig. 2
	U.S. Patent Publication No. 2008/0095252 to Kim at [0020], [0025], [0032]-[0035]
	U.S. Provisional Application No. 61/086,834 to Shen at Pages 2, 9, Table 2

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situation that the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information.	
7[pre] The method according to claim 6, wherein	The support above for claim 6
7[a] in a situation that the data in the downlink sub-frame that transmits the data is sent as a single codeword stream, each piece of confirmation information in the uplink sub-frame fed back by the user equipment to the eNodeB corresponds to a codeword stream of one downlink sub-frame that transmits the data;	The support above for claim 1 U.S. Patent Publication No. 2008/0095252 to Kim at [0049], [0107], [0109], [0110], [0132], Figs. 10A, 10B
7[b] in a situation that the data in the downlink sub-frame that transmits the data is sent as multiple codeword streams, for one downlink sub-frame that transmits the data, the user equipment acquires the confirmation information corresponding to each codeword stream thereof, in a situation that any one or more pieces of confirmation information among the confirmation information acquired is the negative acknowledgement message, the user equipment sets the confirmation information of this downlink sub-frame as a negative acknowledgement; in a situation that all the confirmation information acquired is the acknowledgement message, the user equipment sets the confirmation information of this downlink sub-frame as an acknowledgement.	The support above for claim 1
8. The method according to claim 1, wherein in a situation that the downlink sub-frames sent by	The support above for claim 1 U.S. Patent No. 7,774,686 to Anh at 6:48-51, 6:65-7:9, Table 1

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the eNodeB to the user equipment includes special sub-frames which cannot transmit data, the user equipment does not consider the special sub-frames when feeding back the confirmation information.	U.S. Patent No. 8,281,204 to Hu at 4:23-24, 6:54-60, Fig. 2
	U.S. Patent Publication No. 2008/0095252 to Kim at [0028], [0049], [0105], [0107], [0108], [0110]-[0114], [0118]-[0120], [0128], [0129], Figs. 10A, 10B, 11, 12
	U.S. Provisional Application No. 61/086,834 to Shen at Page 1, Table 1
9[pre] A method for feeding back confirmation information on a physical uplink shared channel, wherein, when the confirmation information is fed back together with uplink data on the physical uplink shared channel, in a situation that a user equipment fails to detect a physical downlink control channel corresponding to transmitted data in a sub-frame transmitting data, the user equipment feeds back a negative acknowledgement message as confirmation information of this downlink sub-frame; in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-frame transmitting the data, the user equipment analyzes data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a situation that the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information;	The support above for claim 1
9[a] wherein in a situation that the user equipment feeds back a plurality of groups of the confirmation information, an amount of the confirmation information fed back in each group is equal to a	The support above for claim 1[c]

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maximum number of codeword streams in this downlink sub-frame, and respective confirmation information in each group corresponds to the confirmation information of the codeword stream of a corresponding downlink sub-frame;	
9[b] in a situation that the number of the codeword streams of the downlink sub-frame is smaller than the maximum number of the codeword streams of the downlink sub-frame, the user equipment feeds back the confirmation information of the maximum number of the codeword streams, wherein confirmation information without a corresponding codeword stream is set as a predefined fixed value;	The support above for claim 1[d]
9[c] when the user equipment fails to detect the physical downlink control channel corresponding to the transmitted data in the sub-frame which transmits the data, the user equipment feeds back the negative acknowledgement message as the confirmation information of each codeword stream in a group corresponding to this downlink sub-frame.	The support above for claim 1[e]
10[pre] The method according to claim 9, wherein	The support above for claim 9
10[a] in a situation that the data in the downlink sub-frame that transmits the data is sent as a single codeword stream, each piece of confirmation information in the uplink sub-frame fed back by the user equipment to an eNodeB corresponds to a codeword stream of one downlink sub-frame that transmits the data;	The support above for claim 7[a]

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10[b] in a situation that the data in the downlink sub-frame which transmits the data is sent as multiple codeword streams, for one downlink sub-frame that transmits the data, the user equipment acquires the confirmation information corresponding to each codeword stream thereof, in a situation that any one or more pieces of confirmation information among the confirmation information acquired is the negative acknowledgement message, the user equipment sets the confirmation information of this downlink sub-frame as a negative acknowledgement; in a situation that all the confirmation information acquired is the acknowledgement message, the user equipment sets the confirmation information of this downlink sub-frame as an acknowledgement.	The support above for claim 7[b]
11. The method according to claim 2, wherein in a situation that the user equipment fails to detect a physical downlink control channel corresponding to transmitted data in the sub-frame transmitting the data, or fails to receive the data thereof, the user equipment feeds back a negative acknowledgement message as the confirmation information of this downlink sub-frame; in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-frame transmitting the data, the user equipment analyzes the data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a situation that	The support above for claim 6

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the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information.	
12. The method according to claim 3, wherein in a situation that the user equipment fails to detect a physical downlink control channel corresponding to transmitted data in the sub-frame transmitting the data, or fails to receive the data thereof, the user equipment feeds back a negative acknowledgement message as the confirmation information of this downlink sub-frame; in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-frame transmitting the data, the user equipment analyzes the data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a situation that the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information.	The support above for claim 6
13. The method according to claim 4, wherein in a situation that the user equipment fails to detect a physical downlink control channel corresponding to transmitted data in the sub-frame transmitting the data, or fails to receive the data thereof, the user equipment feeds back a negative acknowledgement message as the confirmation information of this downlink sub-frame; in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-	The support above for claim 6

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frame transmitting the data, the user equipment analyzes the data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a situation that the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information.	
14. The method according to claim 5, wherein in a situation that the user equipment fails to detect a physical downlink control channel corresponding to transmitted data in the sub-frame transmitting the data, or fails to receive the data thereof, the user equipment feeds back a negative acknowledgement message as the confirmation information of this downlink sub-frame; in a situation that the user equipment detects the physical downlink control channel corresponding to the transmitted data in the sub-frame transmitting the data, the user equipment analyzes the data in this downlink sub-frame, and feeds back an acknowledgement message as the confirmation information in a situation that the analysis is successful, otherwise, the negative acknowledgement message is fed back as the confirmation information.	The support above for claim 6