

WHAT IS CLAIMED IS:

1. A data transmitting method, performed by a terminal, the method comprising:
receiving beam indication information, wherein the beam indication information is configured to indicate a plurality of transmission beams for a configured grant Physical Uplink Shared Channel (CG-PUSCH); and

transmitting data based on a beam for transmitting uplink data on the CG-PUSCH configured by a base station;

in a case where the CG-PUSCH is configured as a channel of an unlicensed spectrum, performing a clear channel assessment (CCA) detection on the unlicensed spectrum before transmitting the data, wherein in a case where the data is transmitted using the plurality of transmission beams, beams for performing the CCA detection are the same as transmission beams on which the data is to be transmitted by the terminal; and

in a case where the CCA detection is successful, selecting part of the transmission beams from the plurality of transmission beams to transmit the data on the CG-PUSCH.

2. The method of claim 1, wherein receiving the beam indication information comprises:

receiving the beam indication information transmitted through Radio Resource Control (RRC) signaling; or

receiving the beam indication information transmitted through Downlink Control Information (DCI).

3. The method of claim 2, wherein the DCI is an activation DCI for activating the CG-PUSCH to transmit data.

4. The method of claim 1, wherein transmitting the data on the CG-PUSCH using the plurality of transmission beams comprises:

transmitting the data on the CG-PUSCH using different transmission beams within different time units of one configured period of the CG-PUSCH.

5. The method of claim 4, wherein transmitting the data on the CG-PUSCH using different transmission beams within different time units of one configured period of the CG-PUSCH comprises:

transmitting the data on the CG-PUSCH by polling the different transmission beams within different time units of the one configured period of the CG-PUSCH.

6. The method of claim 1, wherein transmitting the data on the CG-PUSCH using the plurality of transmission beams comprises:

transmitting the data using different transmission beams in different configured periods of the CG-PUSCH; wherein the data is transmitted using a same transmission beam within different time units of one configured period.

7. The method of claim 6, wherein transmitting the data using different transmission beams in different configured periods of the CG-PUSCH comprises:

transmitting the data by polling the different transmission beams in different configured periods of the CG-PUSCH.

8. A data receiving method, performed by a base station, the method comprising:

transmitting beam indication information, wherein the beam indication information is configured to indicate a plurality of transmission beams for a configured grant Physical Uplink Shared Channel (CG-PUSCH); and

receiving data based on a beam configured for transmitting uplink data on the CG-PUSCH;

receiving the data transmitted by a terminal on the CG-PUSCH using part of the transmission beams selected from the plurality of transmission beams in a case where the CG-PUSCH is configured as a channel of an unlicensed spectrum, wherein the terminal performs a clear channel assessment (CCA) detection on the unlicensed spectrum before transmitting the data and the CCA detection is successful, and wherein in a case where the data is transmitted using the plurality of transmission beams, beams for performing the CCA detection are the same as transmission beams on which the data is to be transmitted by the terminal.

9. The method of claim 8, wherein transmitting the beam indication information comprises:

transmitting Radio Resource Control (RRC) signaling carrying the beam indication information; or

transmitting Downlink Control Information (DCI) carrying the beam indication information.

10. The method of claim 9, wherein the DCI is an activation DCI for activating the CG-PUSCH to transmit data.

11. A data transmitting apparatus, applied in a terminal, the apparatus comprising a first receiving module and a first transmitting module, wherein

the first receiving module is configured to receive beam indication information, wherein the beam indication information is configured to indicate a plurality of transmission beams for a configured grant Physical Uplink Shared Channel (CG-PUSCH); and

the first transmitting module is configured to transmit data based on a beam for transmitting uplink data on the CG-PUSCH configured by a base station;

wherein the apparatus is further configured to:

in a case where the CG-PUSCH is configured as a channel of an unlicensed spectrum, perform a clear channel assessment (CCA) detection on the unlicensed spectrum before transmitting the data, wherein in a case where the data is transmitted using the plurality of transmission beams, beams for performing the CCA detection are the same as transmission beams on which the data is to be transmitted by the terminal; and

in a case where the CCA detection is successful, select part of the transmission beams from the plurality of transmission beams to transmit the data on the CG-PUSCH.

12. The apparatus of claim 11, wherein the first receiving module is further configured to:

receive the beam indication information transmitted through Radio Resource Control (RRC) signaling; or

receive the beam indication information transmitted through Downlink Control Information (DCI).

13. The apparatus of claim 12, wherein the DCI is an activation DCI for activating the CG-PUSCH to transmit data.

14. The apparatus of claim 11, wherein the first transmitting module is further

configured to:

transmit the data on the CG-PUSCH using different transmission beams within different time units of one configured period of the CG-PUSCH.

15. The apparatus of claim 14, wherein the first transmitting module is further configured to:

transmit the data on the CG-PUSCH by polling the different transmission beams within the different time units of the one configured period of the CG-PUSCH.

16. The apparatus of claim 11, wherein the first transmitting module is further configured to:

transmit the data using different transmission beams in different configured periods of the CG-PUSCH, wherein the data is transmitted using the same transmission beam within different time units of one configured period.

17. The apparatus of claim 16, wherein the first transmitting module is further configured to:

transmit the data by polling the different transmission beams in different configured periods of the CG-PUSCH.

18. A data receiving apparatus, applied in a base station, the apparatus comprising a second transmitting module and a second receiving module, wherein

the second transmitting module is configured to transmit beam transmission information, wherein the beam transmission information is configured to indicate a plurality of transmission beams for a configured grant Physical Uplink Shared Channel (CG-PUSCH); and

the second receiving module is configured to receive data based on a beam configured for transmitting uplink data on the CG-PUSCH;

wherein the apparatus is further configured to: receive the data transmitted by a terminal on the CG-PUSCH using part of the transmission beams selected from the plurality of transmission beams in a case where the CG-PUSCH is configured as a channel of an unlicensed spectrum, wherein the terminal performs a clear channel assessment (CCA) detection on the unlicensed spectrum before transmitting the data and the CCA

detection is successful, and wherein in a case where the data is transmitted using the plurality of transmission beams, beams for performing the CCA detection are the same as transmission beams on which the data is to be transmitted by the terminal.

19. The apparatus of claim 18, wherein the second transmitting module is further configured to:

transmit Radio Resource Control (RRC) signaling carrying the beam indication information; or

transmit Downlink Control Information (DCI) carrying the beam indication information.

20. The apparatus of claim 19, wherein the DCI is an activation DCI for activating the CG-PUSCH to transmit data.

21. A communication device, comprising:

an antenna;

a memory; and

a processor, connected to the antenna and the memory and configured to control transmission and reception of the antenna, wherein the processor is configured to perform a method of any one of claims 1 to 7 or the method of any one of claims 8 to 10 by performing computer-executable instructions stored on the memory.

22. A computer storage medium, having computer-executable programs stored thereon, wherein when the computer-executable programs are executed by a processor, the method of any one of claims 1 to 7 or the method of any one of claims 8 to 10 is performed.