CLAIMS

1. A beam management method, comprising:

sending, by a first communication apparatus, a first radio frame to a second communication apparatus in a first frequency band, wherein the first radio frame indicates that searching for a millimeter-wave transmit beam is about to start;

sending, by the first communication apparatus, a second radio frame to the second communication apparatus in a second frequency band, wherein the second radio frame is used for searching for the millimeter-wave transmit beam; and

sending, by the first communication apparatus, a third radio frame to the second communication apparatus in the first frequency band, wherein the third radio frame indicates the second communication apparatus to feed back an index of a received millimeter-wave transmit beam, wherein

the first frequency band is less than the second frequency band.

2. The method according to claim 1, wherein the method further comprises:

receiving, by the first communication apparatus, a fourth radio frame from the second communication apparatus in the first frequency band, wherein the fourth radio frame comprises the index of the received millimeter-wave transmit beam.

3. The method according to claim 1 or 2, wherein the method further comprises:

sending, by the first communication apparatus, a fifth radio frame to the second communication apparatus in the first frequency band, wherein the fifth radio frame is used to request to perform searching of a millimeter-wave receive beam, and the fifth radio frame further indicates a number of millimeter-wave receive beams;

receiving, by the first communication apparatus, a fifth radio frame from the second communication apparatus in the first frequency band, wherein the fifth radio frame further indicates to perform searching of the millimeter-wave receive beam; and

receiving, by the first communication apparatus, a second radio frame from the second communication apparatus in the second frequency band, wherein the second radio frame is further used for searching for the millimeter-wave receive beam.

4. The method according to claim 3, wherein

the fifth radio frame is further used to request to perform millimeter-wave beam combined training, and the fifth radio frame further indicates a number of millimeter-wave transmit beams and a number of millimeter-wave receive beams in the combined training.

5. The method according to claim 4, wherein the fifth radio frame further indicates to perform the millimeter-wave beam combined training.

6. The method according to any one of claims 1 to 5, wherein

the first radio frame comprises a null data physical protocol data unit announcement NDPA, an application identifier AID field in the NDPA comprises a first value, and the first value indicates that searching for the millimeter-wave transmit beam is about to start.

7. The method according to any one of claims 1 to 6, wherein

the second radio frame comprises a null data physical protocol data unit NDP, the NDP comprises a beam index field, and the beam index field indicates an index of a millimeter-wave transmit beam.

8. The method according to claim 7, wherein the NDP further comprises at least one of the following:

a bandwidth field, a partial AID field, a number of symbols field of a long training field, a number of millimeter-wave transmit beams field, a cyclic redundancy check code field, or a number of remaining to-be-sent millimeter-wave beams field.

9. The method according to any one of claims 3 to 8, wherein the fifth radio frame comprises at least one of the following:

a millimeter-wave receive beam training request field, a millimeter-wave receive beam training confirm field, a millimeter-wave beam combined training request field, a millimeter-wave beam combined training confirm field, a number of to-be-trained millimeter-wave receive beams field, or a number of to-be-trained millimeter-wave transmit beams field.

10. A beam management method, comprising:

receiving, by a second communication apparatus, a first radio frame from a first communication apparatus in a first frequency band, wherein the first radio frame indicates that searching for a millimeter-wave transmit beam is about to start;

receiving, by the second communication apparatus, a second radio frame from the first communication apparatus in a second frequency band, wherein the second radio frame is used for searching for the millimeter-wave transmit beam; and

receiving, by the second communication apparatus, a third radio frame from the first communication apparatus in the first frequency band, wherein the third radio frame indicates the second communication apparatus to feed back an index of a received millimeter-wave transmit beam, wherein

the first frequency band is less than the second frequency band.

11. The method according to claim 10, wherein the method further comprises:

sending, by the second communication apparatus, a fourth radio frame to the first communication apparatus in the first frequency band, wherein the fourth radio frame comprises the index of the received millimeter-wave transmit beam.

12. The method according to claim 10 or 11, wherein the method further comprises:

receiving, by the second communication apparatus, a fifth radio frame from the first communication apparatus in the first frequency band, wherein the fifth radio frame is used to request to perform searching of a millimeter-wave receive beam, and the fifth radio frame further indicates a number of millimeter-wave receive beams;

sending, by the second communication apparatus, the fifth radio frame to the first communication apparatus in the first frequency band, wherein the fifth radio frame further indicates to perform searching of the millimeter-wave receive beam; and

sending, by the second communication apparatus, the second radio frame to the first communication apparatus in the second frequency band, wherein the second radio frame is further used for searching for the millimeter-wave receive beam.

13. The method according to claim 12, wherein

the fifth radio frame is further used to request to perform millimeter-wave beam combined training, and the fifth radio frame further indicates a number of millimeter-wave transmit beams and a number of millimeter-wave receive beams in the combined training.

14. The method according to claim 13, wherein the fifth radio frame further indicates to perform the millimeter-wave beam combined training.

15. The method according to any one of claims 10 to 14, wherein

the first radio frame comprises a null data physical protocol data unit announcement NDPA, an application identifier AID field in the NDPA comprises a first value, and the first value indicates that searching for the millimeter-wave transmit beam is about to start.

16. The method according to any one of claims 10 to 15, wherein

the second radio frame comprises a null data physical protocol data unit NDP, the NDP comprises a beam index field, and the beam index field indicates an index of a millimeter-wave transmit beam.

17. The method according to claim 16, wherein the NDP further comprises at least one of the following:

a bandwidth field, a partial AID field, a number of symbols field of a long training field, a number of millimeter-wave transmit beams field, a cyclic redundancy check code field, or a number of remaining to-be-sent millimeter-wave beams field.

18. The method according to any one of claims 12 to 17, wherein the fifth radio frame comprises at least one of the following:

a millimeter-wave receive beam training request field, a millimeter-wave receive beam training confirm field, a millimeter-wave beam combined training request field, a millimeter-wave beam combined training confirm field, a number of to-be-trained millimeter-wave receive beams

field, or a number of to-be-trained millimeter-wave transmit beams field.

19. A communication apparatus, comprising a processor, wherein the processor is configured to enable, by executing a computer program or instructions or via a logic circuit, the communication apparatus to perform the method according to any one of claims 1 to 18.

20. The communication apparatus according to claim 19, wherein the communication apparatus further comprises a memory, and the memory is configured to store the computer program or the instructions.

21. The communication apparatus according to claim 19 or 20, wherein the communication apparatus further comprises a communication interface, and the communication interface is configured to input and/or output a signal.

22. A communication apparatus, comprising a logic circuit and an input/output interface, wherein the input/output interface is configured to input and/or output a signal, and

the logic circuit is configured to perform the method according to any one of claims 1 to 18.

23. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program or instructions, and

when the computer program or the instructions are run on a computer, the method according to any one of claims 1 to 18 is performed.

24. A computer program product, comprising instructions, wherein when the instructions are run on a computer, the method according to any one of claims 1 to 18 is performed.