CLAIMS

1. A communications method, comprising:

receiving, by a terminal, first indication information from a network device, wherein the first indication information indicates a type of a right multiplication matrix in a first codebook, the first codebook satisfies a formula $W = W_1 \widetilde{W}_2 W_f^H$, the first codebook is W, W_1 is a port selection matrix, $\widetilde{W}_2$ is a linear superposition coefficient matrix, W_f is the right multiplication matrix, and W_f^H is a conjugate transpose of W_f; and

determining, by the terminal, channel state information based on the first indication information .

2. The method according to claim 1, wherein the first indication information indicates that the type of W_f is a port selection matrix.

3. The method according to claim 1, wherein the first indication information indicates that the type of W_f is one specific column vector.

4. The method according to claim 3, wherein the one specific column vector is a column vector in which all elements are 1.

5. The method according to claim 1, wherein the first indication information indicates that the type of W_f is a discrete Fourier transform (DFT) matrix, and the DFT matrix comprises a column vector in which all elements are 1.

6. The method according to claim 5, wherein the first indication information further indicates the column vector in which all elements are 1.

7. The method according to claim 5, wherein the method further comprises:

receiving, by the terminal, second indication information from the network device, wherein the second indication information is used to indicate the column vector in which all elements are 1.

8. The method according to any one of claims 1 to 7, wherein W_1 is used to select one or a plurality of channel state information reference signal (CSI-RS) port groups, and W_f is used to select one or more CSI-RS ports in the CSI-RS port group, or used to select one or more CSI-RS ports in the plurality of CSI-RS port groups.

9. The method according to claim 1 or 2, wherein W_f is a port selection matrix, a length of a column vector of W_f is M_{Group}, a length of a column vector of W_1 is $2\tilde{X}_{Group}$, $M_{Group}*\tilde{X}_{Group}$=X/2, X is used to indicate a quantity of CSI-RS ports, M_{Group} is an integer greater than or equal to 1, and is used to indicate to select M_{Group} frequency-domain vectors, and $\tilde{X}_{Group}$ is an integer greater than or equal to 1, and is used to indicate to select $\tilde{X}_{Group}$ spatial-domain vectors in one polarization direction.

10. The method according to claim 3, wherein the channel state information comprises feedback information, and the feedback information indicates W_1 and $\widetilde{W}_2$.

11. The method according to claim 3 or 4, wherein a length of a column vector of W_f is N_{RB}^0, a length of a column vector of W_1 is X, X is used to indicate a quantity of CSI-RS ports, and N_{RB}^0 is an integer greater than or equal to 1, and is used to indicate to select N_{RB}^0 frequency-domain vectors.

12. A communications method, comprising:

determining, by a network device, first indication information; and

transmitting, by the network device, the first indication information to a terminal, wherein the first indication information indicates a type of a right multiplication matrix in a first codebook, the first codebook satisfies a formula $\mathrm{W} = W_1\widetilde{W}_2W_f^H$, the first codebook is W, W_1 is a port selection matrix, $\widetilde{W}_2$ is a linear superposition coefficient matrix, W_f is the right multiplication matrix, and W_f^H is a conjugate transpose of W_f.

13. The method according to claim 12, wherein the first indication information indicates that the type of W_f is a port selection matrix.

14. The method according to claim 12, wherein the first indication information indicates that the type of W_f is one specific column vector.

15. The method according to claim 14, wherein the one specific column vector is a column vector in which all elements are 1.

16. The method according to claim 12, wherein the first indication information indicates that the type of W_f is a discrete Fourier transform (DFT) matrix, and the DFT matrix comprises a column vector in which all elements are 1.

17. The method according to claim 16, wherein the first indication information further

indicates the column vector in which all elements are 1.

18. The method according to claim 16, wherein the method further comprises:

sending, by the network device, second indication information to the terminal, wherein the second indication information is used to indicate the column vector in which all elements are 1.

19. The method according to any one of claims 12 to 18, wherein W_1 is used to select one or a plurality of channel state information reference signal (CSI-RS) port groups, and W_f is used to select one or more CSI-RS ports in the CSI-RS port group, or used to select one or more CSI-RS ports in the plurality of CSI-RS port groups.

20. The method according to claim 12 or 13, wherein W_f is a port selection matrix, a length of a column vector of W_f is M_{Group}, a length of a column vector of W_1 is $2\tilde{X}_{Group}$, $M_{Group}*\tilde{X}_{Group}$=X/2, X is used to indicate a quantity of CSI-RS ports, M_{Group} is an integer greater than or equal to 1, and is used to indicate to select M_{Group} frequency-domain vectors, and $\tilde{X}_{Group}$ is an integer greater than or equal to 1, and is used to indicate to select $\tilde{X}_{Group}$ spatial-domain vectors in one polarization direction.

21. The method according to claim 14, wherein the channel state information comprises feedback information, and the feedback information indicates W_1 and $\widetilde{W}_2$.

22. The method according to claim 14 or 15, wherein a length of a column vector of W_f is N_{RB}^0, a length of a column vector of W_1 is X, X is used to indicate a quantity of CSI-RS ports, and N_{RB}^0 is an integer greater than or equal to 1, and is used to indicate to select N_{RB}^0 frequency-domain vectors.

23. A communications apparatus, comprising a receiving unit and a processing unit, wherein

the receiving unit is configured to receive first indication information from a network device, wherein the first indication information indicates a type of a right multiplication matrix in a first codebook, the first codebook satisfies a formula $\mathrm{W} = W_1\widetilde{W}_2W_f^H$, the first codebook is W, W_1 is a port selection matrix, $\widetilde{W}_2$ is a linear superposition coefficient matrix, W_f is the right multiplication matrix, and W_f^H is a conjugate transpose of W_f, and is used by the apparatus to determine channel state information based on the first codebook; and

the processing unit is configured to determine channel state information based on the first indication information.

24. The communications apparatus according to claim 23, wherein the first indication information indicates that the type of W_f is a port selection matrix.

25. The communications apparatus according to claim 23, wherein the first indication information indicates that the type of W_f is one specific column vector.

26. The communications apparatus according to claim 25, wherein the one specific column vector is a column vector in which all elements are 1.

27. The communications apparatus according to claim 23, wherein the first indication information indicates that the type of W_f is a discrete Fourier transform (DFT) matrix, and the DFT matrix comprises a column vector in which all elements are 1.

28. The communications apparatus according to claim 27, wherein the first indication information further indicates the column vector in which all elements are 1.

29. The communications apparatus according to claim 27, wherein the receiving unit is further configured to:

receive second indication information from the network device, wherein the second indication information is used to indicate the column vector in which all elements are 1.

30. The communications apparatus according to any one of claims 23 to 29, wherein W_1 is used to select one or a plurality of channel state information reference signal (CSI-RS) port groups, and W_f is used to select one or more CSI-RS ports in the CSI-RS port group, or used to select one or more CSI-RS ports in the plurality of CSI-RS port groups.

31. The communications apparatus according to claim 23 or 24, wherein W_f is a port selection matrix, a length of a column vector of W_f is M_{Group}, a length of a column vector of W_1 is $2\tilde{X}_{Group}$, M_{Group}*$\tilde{X}_{Group}$=X/2, X is used to indicate a quantity of CSI-RS ports, M_{Group} is an integer greater than or equal to 1, and is used to indicate to select M_{Group} frequency-domain vectors, and $\tilde{X}_{Group}$ is an integer greater than or equal to 1, and is used to indicate to select $\tilde{X}_{Group}$ spatial-domain vectors in one polarization direction.

32. The communications apparatus according to claim 31, wherein the channel state information comprises feedback information, and the feedback information indicates W_1 and $\widetilde{W}_2$.

33. The communications apparatus according to claim 25 or 26, wherein a length of a column vector of W_f is N_{RB}^0, a length of a column vector of W_1 is X, X is used to indicate a quantity of

CSI-RS ports, and N_{RB}^{0} is an integer greater than or equal to 1, and is used to indicate to select N_{RB}^{0} frequency-domain vectors.

34. A communications apparatus, comprising a receiving unit and a processing unit, wherein the processing unit is configured to determine first indication information; and

the receiving unit is configured to transmit the first indication information to a terminal, wherein the first indication information indicates a type of a right multiplication matrix in a first codebook, the first codebook satisfies a formula $\mathrm{W} = W_1\widetilde{W}_2W_f^H$, the first codebook is W, W_1 is a port selection matrix, $\widetilde{W}_2$ is a linear superposition coefficient matrix, W_f is the right multiplication matrix, and W_f^H is a conjugate transpose of W_f.

35. The communications apparatus according to claim 34, wherein the first indication information indicates that the type of W_f is a port selection matrix.

36. The communications apparatus according to claim 34, wherein the first indication information indicates that the type of W_f is one specific column vector.

37. The communications apparatus according to claim 36, wherein the one specific column vector is a column vector in which all elements are 1.

38. The communications apparatus according to claim 34, wherein the first indication information indicates that the type of W_f is a discrete Fourier transform (DFT) matrix, and the DFT matrix comprises a column vector in which all elements are 1.

39. The communications apparatus according to claim 38, wherein the first indication information further indicates the column vector in which all elements are 1.

40. The communications apparatus according to claim 38, wherein the communications apparatus comprises a sending unit, the sending unit is further configured to:

send second indication information to the terminal, wherein the second indication information is used to indicate the column vector in which all elements are 1.

41. The communications apparatus according to any one of claims 34 to 40, wherein W_1 is used to select one or a plurality of channel state information reference signal (CSI-RS) port groups, and W_f is used to select one or more CSI-RS ports in the CSI-RS port group, or used to select one or more CSI-RS ports in the plurality of CSI-RS port groups.

42. The communications apparatus according to claim 34 or 35, wherein W_f is a port selection matrix, a length of a column vector of W_f is M_{Group}, a length of a column vector of

W_1 is $2\tilde{X}_{Group}$, M_{Group}*$\tilde{X}_{Group}$=X/2, X is used to indicate a quantity of CSI-RS ports, M_{Group} is an integer greater than or equal to 1, and is used to indicate to select M_{Group} frequency-domain vectors, and $\tilde{X}_{Group}$ is an integer greater than or equal to 1, and is used to indicate to select $\tilde{X}_{Group}$ spatial-domain vectors in one polarization direction.

43. The communications apparatus according to claim 36, wherein the channel state information comprises feedback information, and the feedback information indicates W_1 and $\widetilde{W}_2$.

44. The communications apparatus according to claim 36 or 37, wherein a length of a column vector of W_f is N_{RB}^0, a length of a column vector of W_1 is X, X is used to indicate a quantity of CSI-RS ports, and N_{RB}^0 is an integer greater than or equal to 1, and is used to indicate to select N_{RB}^0 frequency-domain vectors.

45. A communications apparatus, wherein the communications apparatus comprises a processor and a memory, the memory is configured to store a computer program, and the processor is configured to execute the computer program stored in the memory, to enable the apparatus to perform the communications method according to any one of claims 1 to 11, or any one of claims 12 to 22.

46. The communications apparatus according to any one of claims 23-45, wherein the communications apparatus is a chip.

47. A communications system, comprising the communications apparatus according to any one of claims 23 to 33 and the communications apparatus according to any one of claims 34 to 44.

48. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program; and when the computer program is executed by a computer, the computer is enabled to perform the method according to any one of claims 1 to 11, or any one of claims 12 to 22.

49. A computer program product, wherein the computer program product stores a computer program; and when the computer program is executed by a computer, the computer is enabled to perform the method according to any one of claims 1 to 11, or any one of claims 12 to 22.