CLAIMS

~~What is claimed is:~~

1. A discontinuous reception control method, comprising:

performing, by a first terminal, a first operation during sidelink-based transmission, wherein the first operation comprises at least one of the following: the first terminal determines a status of whether to send a hybrid automatic repeat request HARQ feedback, and the first terminal decodes a data packet; and

determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception.

2. The method according to claim 1, wherein before the performing, by a first terminal, a first operation, the method further comprises:

receiving, by the first terminal, sidelink control information SCI sent by a second terminal; wherein

the SCI is used to indicate at least one of the following:

the first terminal is configured with HARQ enable, the first terminal uses a negative-only acknowledgement information mode, and the first terminal uses a negative-positive acknowledgement information mode.

3. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

after the first terminal sends HARQ feedback to the second terminal, starting, by the first terminal, a first timer in timers for controlling sidelink discontinuous reception, wherein the HARQ feedback is positive feedback ACK or negative feedback NACK; and

in a case that the first timer expires and decoding of a data packet by the first terminal succeeds or fails, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a physical sidelink control channel PSCCH and/or a physical sidelink shared channel PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

4. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

after the first terminal sends HARQ feedback to the second terminal, in a case that the HARQ feedback is NACK, starting, by the first terminal, a first timer in timers for controlling sidelink discontinuous reception, wherein the first terminal does not start the first timer in a case that the HARQ feedback is ACK; and

in a case that the first timer expires and decoding of a data packet by the first terminal succeeds or fails, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a PSCCH and/or a PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

5. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

after the first terminal sends HARQ feedback to the second terminal, starting, by the first terminal, a first timer in timers for controlling sidelink discontinuous reception, wherein the HARQ feedback is positive feedback ACK or negative feedback NACK; and

in a case that the first timer expires, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a PSCCH and/or a PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

6. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that a duration of decoding a data packet exceeds a preset duration or decoding fails, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

the preset duration comprises at least one of the following: a running duration of a third timer, a duration specified by a protocol, and a duration configured by a network-side device; and during running of the second timer, the first terminal monitors a PSCCH and/or PSSCH.

7. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-only acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that a distance between the first terminal and the second terminal is greater than or equal to a communication range requirement, determining, by the first terminal, not to send the HARQ feedback and not to start a first timer and a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a PSCCH and/or a PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

8. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-only acknowledgement information mode, the determining, by the first terminal based on an execution result

of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that a distance between the first terminal and the second terminal is greater than or equal to a communication range requirement, determining, by the first terminal, not to send the HARQ feedback, and starting a first timer in timers for controlling sidelink discontinuous reception; wherein

in a case that the first timer expires, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a PSCCH and/or a PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

9. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-only acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that a distance between the first terminal and the second terminal is greater than or equal to a communication range requirement, after decoding of a data packet succeeds or fails and a HARQ feedback being NACK is sent, or after decoding of a data packet succeeds or fails and the first terminal determines not to send the HARQ feedback, starting, by the first terminal, a first timer in timers for controlling sidelink discontinuous reception; and

in a case that the first timer expires and decoding of a data packet by the first terminal succeeds or fails, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a PSCCH and/or a PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

10. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-only acknowledgement

information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that a duration of decoding a data packet corresponding to a HARQ process exceeds a preset duration and decoding fails, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

the preset duration comprises at least one of the following: a running duration of a third timer, a duration specified by a protocol, and a duration configured by a network-side device; and during running of the second timer, the first terminal monitors a PSCCH and/or PSSCH.

11. The method according to claim 2, wherein in a case that the SCI indicates, to the first terminal, HARQ enable and/or use of the negative-only acknowledgement information mode, the determining, by the first terminal based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that it is determined, based on the SCI, that a distance between the first terminal and the second terminal is less than a communication range requirement, determining, by the first terminal, to send the HARQ feedback;

after the HARQ feedback is sent, starting, by the first terminal, a first timer in timers for controlling sidelink discontinuous reception; and

in a case that the first timer expires and decoding of a data packet by the first terminal fails, starting, by the first terminal, a second timer in timers for controlling sidelink discontinuous reception; wherein

during running of the first timer, the first terminal does not monitor a PSCCH and/or a PSSCH; and during running of the second timer, the first terminal monitors the PSCCH and/or the PSSCH.

12. The method according to claim 1, wherein the first operation further comprises: the first terminal determines whether physical sidelink shared channel PSSCH transmission has been performed, and the determining, by the first terminal based on

an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception comprises:

in a case that the first terminal determines that physical sidelink shared channel PSSCH transmission has been performed, starting, by the first terminal, a timer for controlling sidelink discontinuous reception.

13. The method according to claim 12, wherein a mode of the PSSCH transmission comprises one of the following:

performing transmission using a resource pool of a base station scheduling mode for resource allocation; and

performing transmission using a configuration grant or dynamic grant of a terminal autonomous mode for resource allocation.

14. A discontinuous reception control apparatus, comprising:

an execution module, configured to perform a first operation during sidelink-based transmission, wherein the first operation comprises at least one of the following: determining to send a hybrid automatic repeat request HARQ feedback status, and decoding a data packet; and

a determining module, configured to determine, based on an execution result of the first operation, whether to start a timer for controlling sidelink discontinuous reception.

15. The apparatus according to claim 14, further comprising:

a receiving module, configured to: before the first operation is performed, receive sidelink control information SCI sent by a second terminal; wherein

the SCI is used to indicate at least one of the following:

HARQ enable, use of a negative-only acknowledgement information mode, and use of negative-positive acknowledgement information mode.

16. The apparatus according to claim 15, wherein in a case that the SCI indicates HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining module comprises:

a first starting unit, configured to: after HARQ feedback is sent to the second terminal, start a first timer in timers for controlling sidelink discontinuous reception,

wherein the HARQ feedback is positive feedback ACK or negative feedback NACK; and

a second starting unit, configured to: in a case that the first timer expires and decoding of a data packet succeeds or fails, start a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer~~.~~;

or,

~~17. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining module comprises:

a third starting unit, configured to: after HARQ feedback is sent to the second terminal, in a case that the HARQ feedback is NACK, start a first timer in timers for controlling sidelink discontinuous reception, wherein the first timer is not started in a case that the HARQ feedback is ACK; and

a fourth starting unit, configured to: in a case that the first timer expires and decoding of a data packet succeeds or fails, start a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer~~.~~;

or,

~~18. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining module comprises:

a fifth starting unit, configured to: after HARQ feedback is sent to the second terminal, start a first timer in timers for controlling sidelink discontinuous reception, wherein the HARQ feedback is positive feedback ACK or negative feedback NACK; and

a sixth starting unit, configured to: in a case that the first timer expires, start a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer~~.~~;

or,

~~19. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and/or use of the negative-positive acknowledgement information mode, the determining module comprises:

a seventh starting unit, configured to: in a case that a duration of decoding a data packet exceeds a preset duration or decoding fails, start a second timer in timers for controlling sidelink discontinuous reception; wherein

the preset duration comprises at least one of the following: a running duration of a third timer, a duration specified by a protocol, and a duration configured by a network-side device; and during running of the second timer, monitoring on a PSCCH or PSSCH is performed.

~~20~~17. The apparatus according to claim 15, wherein in a case that the SCI indicates HARQ enable and use of the negative-only acknowledgement information mode, the determining module comprises:

a first processing unit, configured to: in a case that a distance from the second terminal is greater than or equal to a communication range requirement, determine not to send the HARQ feedback and not to start a first timer and a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer~~.~~;

or,

~~21. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and use of the negative-only acknowledgement information mode, the determining module comprises:

a second processing unit, configured to: in a case that a distance from the second terminal is greater than or equal to a communication range requirement, determine not to send the HARQ feedback, and start a first timer in timers for controlling sidelink discontinuous reception; and

an eighth starting unit, configured to: in a case that the first timer expires, start a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer~~.~~;

or,

~~22. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and use of the negative-only acknowledgement information mode, the determining module comprises:

a third processing unit, configured to: in a case that a distance from the second terminal is greater than or equal to a communication range requirement, after decoding of a data packet succeeds or fails and a HARQ feedback being NACK is sent, or after decoding of a data packet succeeds or fails and it is determined not to send the HARQ feedback, start a first timer in timers for controlling sidelink discontinuous reception; and

a ninth starting unit, configured to: in a case that the first timer expires and decoding of a data packet succeeds or fails, start a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer~~.~~;

or,

~~23. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and use of the negative-only acknowledgement information mode, the determining module comprises:

a tenth starting unit, configured to: in a case that a duration of decoding a data packet corresponding to a HARQ process exceeds a preset duration and decoding fails, start a second timer in timers for controlling sidelink discontinuous reception; wherein

the preset duration comprises at least one of the following: a running duration of a third timer, a duration specified by a protocol, and a duration configured by a network-side device; and during running of the second timer, monitoring on a PSCCH or PSSCH is performed~~.~~;

or,

~~24. The apparatus according to claim 15,~~ wherein in a case that the SCI indicates HARQ enable and use of the negative-only acknowledgement information mode, the determining module comprises:

a fourth processing unit, configured to: in a case that it is determined, based on the SCI, that a distance from the second terminal is less than a communication range requirement, determine to send the HARQ feedback;

an eleventh starting unit, configured to: after the HARQ feedback is sent, start a first timer in timers for controlling sidelink discontinuous reception; and

a twelfth starting unit, configured to: in a case that the first timer expires and decoding of a data packet fails, start a second timer in timers for controlling sidelink discontinuous reception; wherein

monitoring for a PSCCH and/or PSSCH is not performed during running of the first timer; and monitoring for the PSCCH and/or PSSCH is performed during running of the second timer.

~~25~~18. The apparatus according to claim 14, wherein the first operation further comprises determining whether physical sidelink shared channel PSSCH transmission has been performed, and the determining module comprises:

a thirteenth starting unit, configured to: in a case that it is determined that physical sidelink shared channel PSSCH transmission has been performed, start a timer for controlling sidelink discontinuous reception~~.~~;

~~26. The apparatus according to claim 25,~~ wherein a mode of the PSSCH transmission comprises one of the followings

performing transmission using a resource pool of a base station scheduling mode for resource allocation; and

performing transmission using a configuration grant or dynamic grant of a terminal autonomous mode for resource allocation.

~~27~~19. A terminal, comprising a processor, a memory, and a program or instructions stored in the memory and capable of running on the processor, wherein when the program or instructions are executed by the processor, the steps of the discontinuous reception control method according to any one of claims 1 to 13 are implemented.

~~28~~20. A readable storage medium, wherein the readable storage medium stores a program or instructions, and when the program or the instructions are executed by a processor, the steps of the discontinuous reception control method according to any one of claims 1 to 13 are implemented.

~~29. A computer program product, stored in a non-volatile readable storage medium, wherein the computer program product is executed by at least one processor to implement the discontinuous reception control method according to any one of claims 1 to 13.~~