CLAIMS

1. An anti-freezing method for a braking device, comprising:

obtaining an ambient temperature and a state of a railway vehicle when the railway vehicle is parked; and

controlling a brake caliper to perform a release-and-clamp operation based on an interval of a first preset period, in a case that the ambient temperature is lower than a preset temperature threshold and the state of the railway vehicle meets a preset vehicle condition;

wherein the release-and-clamp operation comprises: releasing the brake caliper for a second preset period and then clamping the brake caliper,

wherein the preset vehicle condition comprises:

a power source of the railway vehicle being in a normal state,

parking braking not being applied to the railway vehicle, and

service braking applied to the railway vehicle being at a maximum 7th level.

2. The anti-freezing method according to claim 1, wherein controlling the brake caliper to perform the release-and-clamp operation based on the interval of the first preset period comprises:

controlling a plurality of brake calipers to perform the release-and-clamp operation in sequence, based on the interval of the first preset period.

3. The anti-freezing method according to claim 2, wherein controlling the plurality of brake calipers to perform the release-and-clamp operation in sequence based on the interval of the first period comprises:

controlling the plurality of brake calipers to perform the release-and-clamp operation according to a preset numbering sequence;

wherein controlling the plurality of brake calipers to perform the release-and-clamp operation according to the preset numbering sequence is repeated, after the last brake caliper according to the preset numbering sequence performs the release-and-clamp operation.

~~4. The anti-freezing method according to any one of claims 1 to 3, wherein the preset vehicle condition comprises:~~

~~a power source of the railway vehicle being in a normal state,~~

~~parking braking not being applied to the railway vehicle, and~~

~~service braking applied to the railway vehicle being at a maximum 7th level.~~

~~5~~4. The anti-freezing method according to any one of claims 1 to 3, further comprising:

obtaining an instruction for activating an anti-freezing mode.

~~6~~5. The anti-freezing method according to any one of claims 1 to 3, further comprising:

timing a third period, in response to determining that the ambient temperature is lower than the preset temperature threshold and the state of the railway vehicle meets the preset vehicle condition; and

controlling all brake calipers to be clamped to restore a braking state, in response to the third period reaching a preset time threshold for termination.

~~7~~6. An anti-freezing apparatus for a braking device, comprising:

an obtaining unit, configured to obtain an ambient temperature and a state of a railway vehicle; and

a control unit, configured to control a brake caliper to perform a release-and-clamp operation based on an interval of a first preset period, in a case that the ambient temperature is lower than a preset temperature threshold and the state of the railway vehicle meets a preset vehicle condition;

wherein the release-and-clamp operation comprises releasing the brake caliper for a second preset period and then clamping the brake caliper,

wherein the preset vehicle condition comprises:

a power source of the railway vehicle being in a normal state,

parking braking not being applied to the railway vehicle, and

service braking applied to the railway vehicle being at a maximum 7th level.

~~8~~7. The anti-freezing apparatus according to claim ~~7~~6, wherein the control unit is further configured to control a plurality of brake calipers to perform the release-and-clamp operation in sequence, based on the interval of the first preset period.

~~9~~8. The anti-freezing apparatus according to claim ~~8~~7, wherein the control unit is further configured to:

control the plurality of brake calipers to perform the release-and-clamp operation according to a preset numbering sequence; and

repeat controlling the plurality of brake calipers to perform the release-and-clamp operation according to the preset numbering sequence, after the last brake caliper according to the preset numbering sequence performs the release-and-clamp operation.

~~10~~9. The anti-freezing apparatus according to any one of claims ~~7~~6 to ~~9~~ 8, further comprising:

a timing unit, configured to time a third period, in response to it being determined that the ambient temperature is lower than the preset temperature threshold and the state of the railway vehicle meets the preset vehicle condition; and

a centralized control unit, configured to control all brake calipers to be clamped to restore a braking state, in response to the third period reaching a preset time threshold for termination.