WHAT IS CLAIMED IS:

1. A wire bonding device for performing a wire bonding process, the wire bonding device comprising:

a bonding tool for inserting a wire;

an ultrasonic vibrator for supplying ultrasonic vibration to the bonding tool via an ultrasonic horn;

a drive mechanism for moving the bonding tool; and

a control part for controlling the wire bonding process,

wherein the control part performs:

a bonding step of bonding the wire to a bonding point which is a bonding target by pressing the wire with the bonding tool;

a tail feeding out step of feeding out a wire tail from the wire bonded to the bonding point;

a tension applying step of raising the bonding tool to apply tension to the wire while the wire is clamped;

a tension release step of lowering the bonding tool to release the tension applied to the wire; and

after performing a series of steps comprising the tension applying step and the tension release step at least once, a tail cutting step of raising the bonding tool to cut the wire tail from the wire bonded to the bonding point.

2. The wire bonding device according to claim 1, wherein in the tail cutting step, the control part performs a series of steps comprising the tension applying step and the tension release step a plurality of times.

3. The wire bonding device according to claim 2, wherein the tension applying step comprises a first tension applying step and a second tension applying step performed after the first tension applying step,

the tension release step is performed between the first tension applying step and the second tension applying step, and

a raising moving amount of the bonding tool in the second tension applying step is greater than a lowering moving amount of the bonding tool in the tension release step.

4. The wire bonding device according to claim 3, wherein the raising moving amount of the bonding tool in the first tension applying step is equal to the raising moving amount of the bonding tool in the second tension applying step.

5. The wire bonding device according to claim 3, wherein the raising moving amount of the bonding tool in the first tension applying step is equal to the lowering moving amount of the bonding tool in the tension release step.

6. The wire bonding device according to any one of claims 1 to 5, wherein the control part further performs:

a first bonding step of bonding the wire at a tip end of the bonding tool to a first bonding point; and

after performing the first bonding step, a wire loop step of looping the wire from the first bonding point toward a second bonding point, which is the bonding point.

7. The wire bonding device according to any one of claims 1 to 5, wherein the bonding step comprises forming the wire at a tip end of the bonding tool in a ball shape and bonding the wire formed in the ball shape to the bonding point.

8. The wire bonding device according to any one of claims 1 to 5, further comprising a detection part for detecting that the wire tail has been cut at the bonding point based on an electric signal supplied to the clamped wire,

wherein when the detection part detects that the wire tail has been cut at the bonding point, the control part stops a series of steps comprising the tension applying step and the tension release step.

9. The wire bonding device according to any one of claims 1 to 8, wherein the raising

moving amount in the tension applying step and the lowering moving amount in the tension release step are set by a predetermined ratio with respect to a thickness of the wire.

10. A wire cutting method performed by using a wire bonding device for performing a wire bonding process,

wherein the wire bonding device comprises:

a bonding tool for inserting a wire;

an ultrasonic vibrator for supplying ultrasonic vibration to the bonding tool via an ultrasonic horn;

a drive mechanism for moving the bonding tool; and

a control part for controlling the wire bonding process, and

the wire cutting method comprises:

a bonding step of bonding the wire to a bonding point which is a bonding target by pressing the wire with the bonding tool;

a tail feeding out step of feeding out a wire tail from the wire bonded to the bonding point;

a tension applying step of raising the bonding tool to apply tension to the wire while the wire is clamped;

a tension release step of lowering the bonding tool to release the tension applied to the wire; and

after performing a series of steps comprising the tension applying step and the tension release step at least once, a tail cutting step of raising the bonding tool to cut the wire tail from the wire bonded to the bonding point.

11. A program for causing a wire bonding device to perform a wire bonding process,

wherein the wire bonding device comprises:

a bonding tool for inserting a wire;

an ultrasonic vibrator for supplying ultrasonic vibration to the bonding tool via an

ultrasonic horn;

a drive mechanism for moving the bonding tool; and

a control part for controlling the wire bonding process, and

the program causes the wire bonding device to perform:

a bonding step of bonding the wire to a bonding point which is a bonding target by pressing the wire with the bonding tool;

a tail feeding out step of feeding out a wire tail from the wire bonded to the bonding point;

a tension applying step of raising the bonding tool to apply tension to the wire while the wire is clamped;

a tension release step of lowering the bonding tool to release the tension applied to the wire; and

after performing a series of steps comprising the tension applying step and the tension release step at least once, a tail cutting step of raising the bonding tool to cut the wire tail from the wire bonded to the bonding point.