CLAIMS

1. A method for detecting a characteristic of plastic tube ends of plastic tubes clamped in a butt welding machine, the method comprising:

clamping plastic tubes in a butt welding machine, the plastic tubes having two opposing respective plastic tube ends which are to be welded together,

wherein the butt welding machine comprises a plane which can be introduced between the plastic tube ends and a heating mirror which can be introduced between the plastic tube ends, wherein at least one sensor is arranged on the plane and/or on the heating mirror,

tilting the plane into a position between the plastic tube ends,

tilting the heating mirror into a position between the plastic tube ends and removing the heating mirror from the position between the plastic heating tube ends,

wherein the plane and/or the heating mirror is tilted into position between the plastic tube ends by means of a controlled movement,

detecting a characteristic of the plastic tube ends with the at least one sensor during the controlled movement of the plane and/or the heating mirror by means of the at least one sensor arranged on the plane and/or on the heating mirror.

2. The method according to claim 1, wherein the at least one sensor comprises separate sensors for respectively detecting each of the two opposing plastic tube ends, and the dimensions of the plastic tube ends are respectively detected by means of the separate sensors.

3. The method according to claim 1, wherein the at least one sensor comprises an optical sensor.

4. The method according to claim 1, wherein the at least one sensor comprises a laser.

5. The method according to claim 1, wherein the at least one sensor comprises a capacitive sensor.

6. The method according to claim 1, wherein the detecting step is carried out without any contact between the at least one sensor and either of the plastic tube ends.

7. The method according to claim 1, wherein a dimension of the plastic tube ends is detected by means of the at least one sensor.

8. The method according to claim 1, wherein a material of the plastic tube ends is detected by means of the at least one sensor.

9. A method of welding tube ends together, comprising:

entering welding parameters into a controller;

clamping first and second tubes so that respective ends of the tubes are aligned but spaced from each other;

affixing a sensor to a tool;

rotating the tool along with the sensor through the space between the tube ends and using the sensor to detect characteristics of the tubes;

comparing the entered welding parameters in the controller with the characteristics detected by the sensor and, if the comparison is acceptable, butting the ends of the tubes to weld them together.

10. The method of claim **9** wherein the tool is a plane or a heated mirror.

11. An apparatus for butt welding respective ends of first and second plastic tubes, the apparatus comprising:

first and second clamps for clamping the respective first and second plastic tubes, the first and second clamps arranged such that they are coaxial, the clamps being moveable toward and away from one another,

a plane, the plane being capable of being introduced between the ends of the clamped plastic tubes in order to plane the plastic tube ends, and

a heating mirror for heating of the plastic tube ends, the heating mirror being capable of being introduced between the ends of the clamped plastic tubes,

wherein the apparatus is configured such that the plane and/or the heating mirror is introduced between the plastic tube ends by means of a controlled tilting movement, and

at least one sensor arranged on the plane and/or on the heating mirror, wherein the at least one sensor is configured to detect a characteristic of the plastic tube ends during the controlled tilting movement of the plane and/or the heating mirror.

12. The apparatus according to claim **11**, further comprising a controller configured to control the controlled tilting movement of the plane and/or the heating mirror and movement of the first and second clamps toward and away from one another.