受験番号：24IPE006

問１）

1. An alternating-current arc welding device comprising:

a welding control unit;

a storage unit;

an alternating-current frequency setting unit which sets an alternating-current frequency;

a reverse polarity period setting unit which sets a reverse polarity period;

a calculation unit which calculates and outputs a straight polarity period and the reverse polarity period to the welding control unit; and

a selection unit which selects and outputs one of a plurality of outputs from the storage unit to the calculation unit,

wherein:

the welding control unit is configured to cause a straight polarity base current smaller than a peak current of the straight polarity period to flow before polarity reversal when the straight polarity period is completed, and configured to cause a reverse polarity base current smaller than a peak current of the reverse polarity period to flow before polarity reversal when the reverse polarity period is completed;

the storage unit is configured to store

(a) a plurality of combinations of a straight polarity base ratio which is a ratio of a period in the straight polarity period in which the straight polarity base current is caused to flow, and a reverse polarity base ratio which is a ratio of a period in the reverse polarity period in which the reverse polarity base current is caused to flow, or

(b) a plurality of combinations of a straight polarity peak period which is a period in the straight polarity period in which the peak current is caused to flow, a straight polarity base period which is the period in which the straight polarity base current is caused to flow, a reverse polarity peak period which is a period in the reverse polarity period in which the peak current is caused to flow, and a reverse polarity base period which is the period in which the reverse polarity base current is caused to flow; and

the selection unit is configured to select one of the plurality of combinations stored in the storage unit, based on an inductance on a welding load side.

問 2)

(A)

In the conventional monitoring system, a sensor may be installed at the parking lot gate. If a vehicle is detected at the gate, the mobile robot can come to the gate where the sensor is installed, process images captured on the way, distinguish the body color of the vehicle, and transmit the information to a center. In this case, the monitoring system preferably captures images which provide information useful for identifying the vehicle.

However, the manner in which the vehicle is parked may differ depending on the character of the thief or the situation of the parking lot, for example, and cannot be predicted. Accordingly, it may be difficult for the mobile robot to capture an image of the automobile so that the body color of the vehicle can be identified.

For example, when the vehicle is captured using a color, visible-light camera to distinguish the body color, an image captured during daytime and an image obtained in the evening may have different color tones due to the influence of sunlight. As a result, a white vehicle may be determined to be orange when photographed in the evening. At night time, the captured image may appear to have a color tone different from the color as viewed by the human eye, depending on light components from illumination equipment installed in the parking lot, advertising illuminations installed on the walls of nearby commercial facilities, and so on.

(A)’

問 3)

(B)

When a removal of supercooling is detected, the food temperature Th_2 immediately after the removal of supercooling corresponds to the freezing point of the food. Based on this temperature, the target temperature Tc_set in the chilled chamber lower container is set to a temperature such that the ice crystals can be melted without cell damage, such as to Th_2 + 2[°C](S9). The internal set temperature at which ice crystals can be melted without cell damage is referred to as the ice crystal melting internal temperature.

Then, as the melting of ice crystals formed in the food ends and the food temperature begins to increase, the target temperature Tc_set in the chilled chamber lower container is maintained at Th_2 + 2[°C](S10) until, e.g., the food temperature Th increases to a temperature Th_2 + 1[°C] which is lower than the ice crystal melting internal temperature and at which the ice crystals are determined to have melted. In order to obtain this state, the damper is maintained in full-closed state, for example, so as to increase the temperature in the chilled chamber lower container. When the food temperature Th after removal of supercooling becomes Th_2 + 1[°C] or higher, the confirmation of the presence or absence of introduction of supercooling or removal of supercooling is again continued through the control from S1 to S8.

(B’)