Development of Business-oriented Dining Table Gas Cooktop "Full Flat Conro (Gas Cooktop)"

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Abstract :

We have developed a built-in single-burner gas-cooktop with original new design, easy maintenance as a result of its flattened top plate, and a safety device unit .

Basic design by Kyoto Institute of Technology, production and performance confirmation towards commercialization by Yamaoka Industrial and technical cooperation by Osaka Gas have led to the development of this new product "Full Flat Conro (Gas Cooktop)",
It's released in October 2012, and awarded "2012 Good Design Award (in JAPAN)".

Key Words: gas cooktop, good design, commercial, flat

1 INTRODUCTION

In Japan at a restaurant and home, a cooktop is installed in the center of table so that people can eat grilled meat or stew with families and friends. The fuel was mostly natural gas or electricity.

With easy maintenance, electric cooktops (Induction Heating type) are increasing recently in business-oriented dining table cooktop market. Built-in single-burner gas-cooktops are competing with electric ones.

We have developed a product with original new design, easy maintenance as a result of its flattened top plate, and a safety device.

It has the following features:

・A design produces a good taste

The flame was lighted from the trivets-integrated burner on the stainless-steel flat metal top, and the palatability will be produced.

・Easy maintenance

Flatness when not in use has been achieved by the newly developed removable trivets-integrated burner and a up and down ignition safety device unit which can be stored in the apparatus. You can use as a table and also easy maintenance.

・Safety device

A standard cooktop includes a fire extinction safety device, which can shut the gas off automatically when the burner flame disappears while in use. A burner installation confirmation safety device stops spark-ignition when the burner or the ignition device is not correctly installed.

2 DEVELOPMENT

Product development project of flat cooktop has started in 2009 as a counter of the IH system in commercial cooktop market.

Development concept is as follows.

・Unused at the time, flat table. It can be used as a table.

・Good design that you will want to visit again, such as surprise.

We have developed the elements for the realization of flat and safety equipment required for burner removal. Practicality, we have develpoed a friendly design in functionality for commercial cooktop.

We have develpoed four prototype models in the exhibition of 2010. From the results of visitor surveys, we have choiced the current model.

2.1 Trivet burner section design

It is based on a model that Kyoto Institute of Technology has proposed household for trivet design (Figure 1). And it is changed material and color (Figure 2). In addition, we have refined the trivet shape for combustion improvement. Its material have been changed to castings from brass because of the mass production (Figure 3).

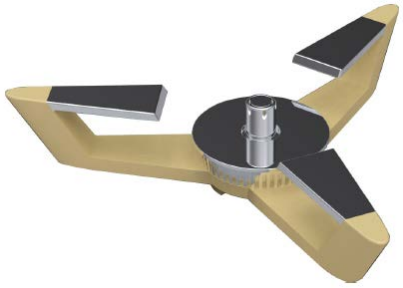


Figure 1 : 2009 year model (Household-based)

Figure 2 : 2010 year model (Changed to commercial review the material and color)

Figure 3 : 2011 final model
(Changed to mass production specification review the combustion structure)

2.2 Trivet burner removable structure

Because it has a structure of attaching and detaching the trivet burner, a safety device is required for making it possible to operate only when it is set in place.

2.2.1 Double safety device

We equipped with a doubel safety device on a burner removable. Method of operation is as follows.
SW1 : Do not spark ignition device when safety device is not set to a predetermined position.
SW2 : Do not ignite when the burner is not set to a predetermined position.

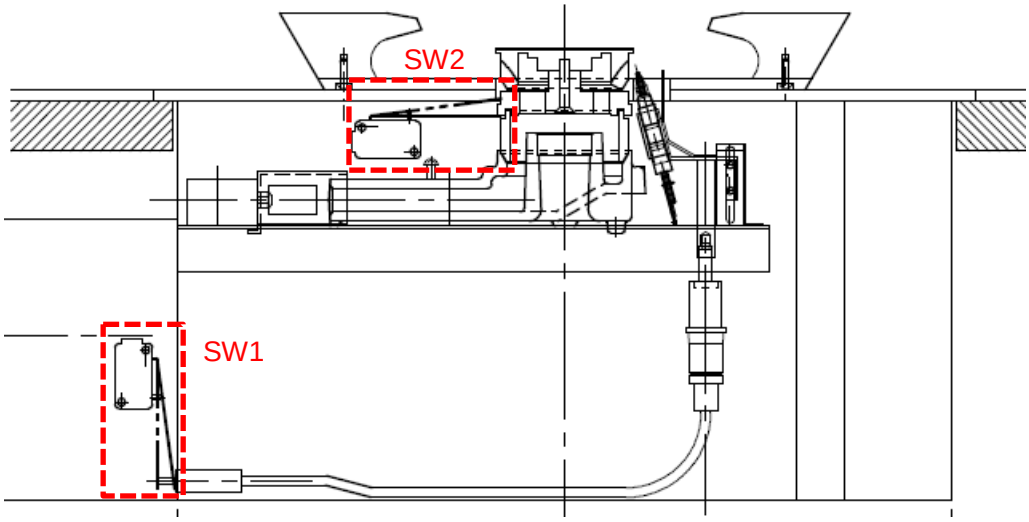


Figure 4 : Safety device structure

2.2.2 Durability confirmation

As the basic unit, we are using cooktop that Yamaoka Industrial is commercially available "NABE-BUGYOU(Conventional model)", there is plenty of reliability of the basic unit parts flat cooktop. Therefore, mainly the reliability check of the parts to realize the flat cooktop. And we conduct durability tests below.

・Structural strength evaluation of the trivet portion by the frying pan drop test.
・Durability evaluation of the vertical movement of the ignition device and safety device.
・Combustion endurance test

2.3 Flat structure

Development of structure for realizing a flat table when not in use. It was realized a complete flat with the structure of the up and down device. Features are as follows.

・You are easy to see the contents of the pot because the position of pot is lower than conventional model.
・To prevent burns, the reduction of temperature by using a stainless steel top plate.

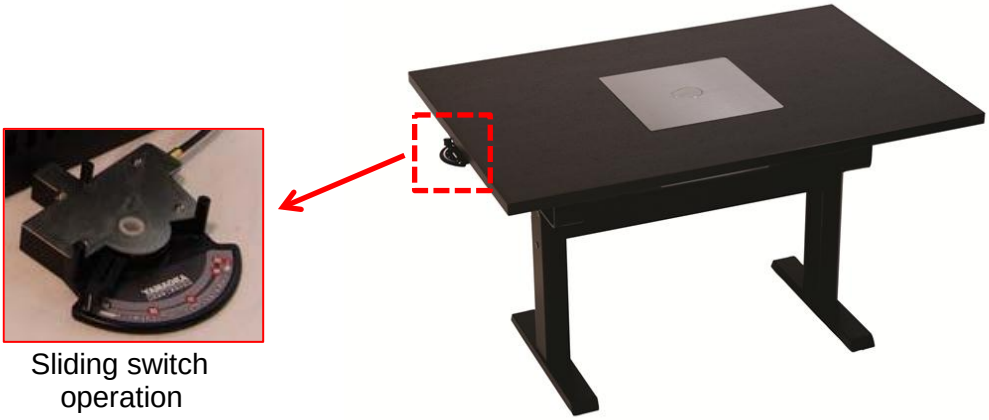
3 FINAL SPECIFICATIONS

In the commercial market, many customers wanted to be built in gas cooktop in the customer specified table. We have produced unit section.

Table 1 : Full Flat Conro specifications

Top plate size	350 mm×350 mm×t 4 mm
Unit dimensions	W458 mm×D372 mm×H210 mm
Weight	10.9 kg
Gas consumption	3.2 kW (2,750 kcal/h)
Pot size	Max 30cm
Operation	Sliding switch(Ignition, Fire stop, Firepower adjustment)

Figure 5 : Full Flat Conro unit



Sliding switch operation

Figure 6 : Built-in example to the table

3.1 How to use

Cap jumps by pushing the key-shaped portion of the top plate cap.
(Safety device and ignition device are up and down at the same time)

- Remove the cap.
- Fitted into the connection of the trivet burner.
- The ignition is sparked by more fully opened the sliding switch.
- Adjusted by sliding the operation switch to the required thermal.

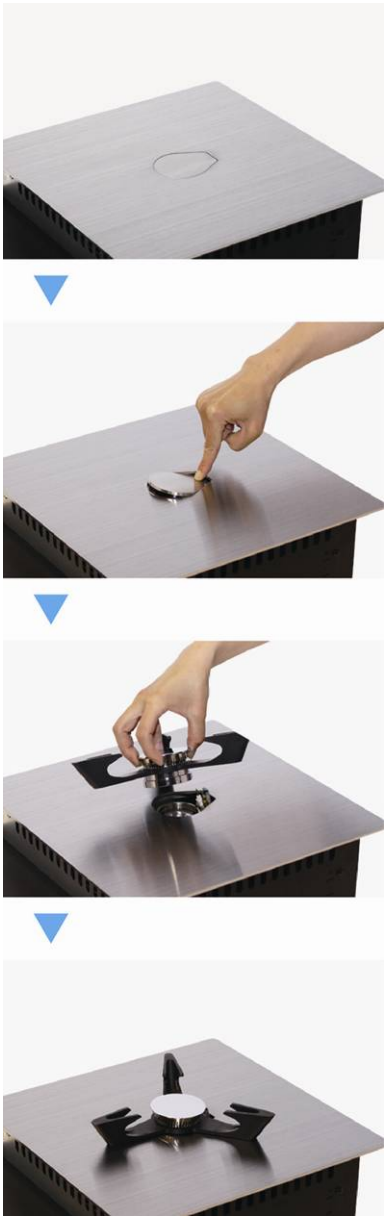


Figure 7 : Burner mounting method

4. CONCLUSION

For the development of this new product "Full Flat Conro (Gas Cooktop)", basic design by Kyoto Institute of Technology, production and performance confirmation towards commercialization by Yamaoka Industrial and technical cooperation from Osaka Gas have led to the development.

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