

Development of the “Class-S Premier” as an Advanced Model of “Si” Sensor-Equipped Gas Cooking stoves

- Featuring a Grill Auto Menu Offering 24 Varieties of Automated Cooking for the First Time in the Industry -

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1. INTRODUCTION

Osaka Gas Co., Ltd. and Harman Pro Co., Ltd. have jointly developed the “Class-S Premier” (called the “S-Blink advanced” by Harman Pro) as a premier class gas cooking stove that meets the industry’s voluntary standard on advanced gas cooking stoves equipped with sensors for each burner (called “Si” sensor-equipped gas cooking stoves). The cooking stove, which was released in October 2008, features a novel appearance and a Grill Auto Menu that offers 24 varieties (*) of automated cooking for the first time in the industry.

The product features are described below.

* This is the largest number of automated cooking options made available by any type of cooking stove

(gas-fired or electric) commonly available in the market for use at home as of March 2009).



<Figure 1 Appearance of Class-S Premier>

2. PRODUCT FEATURES

2.1 Cooking Performance and Convenient Features

The product features a Grill Auto Menu that offers 24 varieties of automated cooking for the first time in the industry, simplifying the preparation of tasty and healthy grilled dishes.

The Grill Auto Menu was newly developed for this product: the user can simply select a cooking option from a menu on the grill operation panel (after selecting [Fish], [A la carte] or [Warming]). The cooking stove automatically adjusts the heat and cooking duration as sensors monitor the grillroom temperature. When cooking is done, a recorded message and buzzer inform the user, and the burner is automatically turned off.

The finalization of 18 *a la carte* cooking options was preceded by a trial by 95 customers, who experimented with cooking at home and reported their experience (satisfaction level and frequency of use).



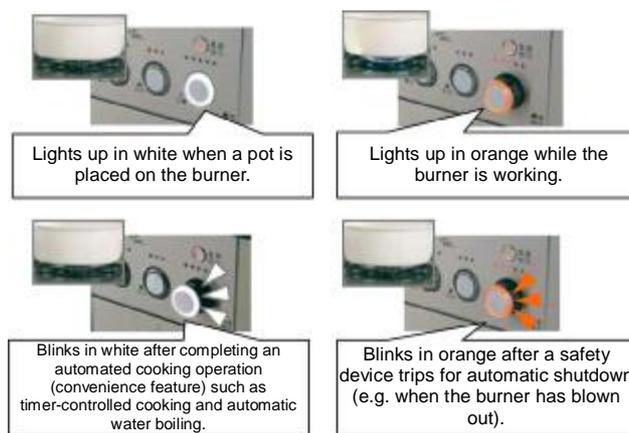
<Figure 2 Grill Operation Panel>

2.2 Safety Features

Higher safety is provided by a Status Ring that makes it easy to identify the status of the cooking stove at a glance.

As a novel design, the burner switch, used for turning the burner on and off, also has a Status Ring. This Status Ring lights up to indicate operation statuses such as burner ON, burner OFF and the completion of timer-controlled cooking.

The Status Ring is designed to be visible not only from the front but also from the side, allowing the cooking stove status to be checked from around the kitchen. This facilitates operation and enhances safety.



<Figure 3: Status Ring>

** Grill Auto Menu

Fish (three cooking options)	fillet, whole, and dried fish 
A la carte (18 cooking options)	roast sweet potato, baked eggplant, chicken leg, foil roast, boiled egg, Vienna sausage, deep-fried tofu (bean curd), baked onigiri (rice ball), yakitori (grilled chicken), toast, pizza, baked squid, roast beef, sparerib, baked apple, mashed sweet potato, morning set (*), and roasted pork  
Warming (three cooking options)	fried dish, broiled fish and yakitori (grilled chicken) 

* The "morning set" cooking option allows simultaneous cooking of a slice of bread, rough-minced Vienna sausages, and about two types of vegetables (e.g. mini tomatoes, broccoli, asparagus, mushrooms, small sweet green pepper, etc.)

2.3 Ease of Cleaning

The newly developed enamel-coated trivet makes it easier to remove charring and stains.

The trivet comes in two types: (1) a good-looking, highly durable stainless steel trivet, and (2) an enamel-coated trivet that is easier to clean.

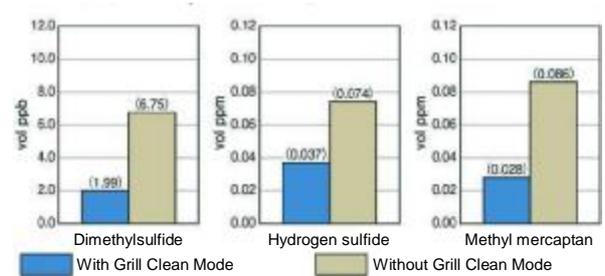
The enamel-coated trivet has a layer of water-repellent coating developed by Osaka Gas. The coating repels food spills, etc. that usually adhere strongly to the uncoated surface of conventional enamel trivets. This coating makes it easier to remove charring and to clean the trivet.

3. OTHER FEATURES

3.1 Grill Clean Mode

In Grill Clean Mode, the grillroom interior, finished with a self-cleaning coating, is heated to a high temperature until odorous components are burned off.

According to a comparative odor test for grillroom exhaust by Osaka Gas, the cleaning operation by Grill Clean Mode decreases dimethylsulfide, hydrogen sulfide and methyl mercaptan, which are some of the components that contribute to the odor from cooking broiled fish.



Test procedure:

After baking three saury fillets 10 times, the grillroom exhaust was analyzed while toasting two slices of bread. For comparison, the Grill Clean Mode operation was either performed or not performed before the toasting.

* The mean value over eight samples (N=8) is shown.

* If the measured concentration is less than the minimum unit of determination, and quantification by calculation is also not possible, 1/4 of the minimum unit of determination is assumed.

<Figure 4 Comparative smell test for grillroom exhaust>

3.2 LCD on the Top Panel

The display is a dot-matrix type LCD, which can be set to a large font for legibility. The LCD displays various information while using the menus.



(when using a convenience feature)



(selection from the *a la carte* menu)

<Figure 5 LCD on the top panel>

3.3 Universal Design Considerations

- I For LEDs and color circling, orange is used rather than red, for the sake of universal color design.
- I The operation switch seating is matte (delustered) to prevent glare from the lighting affecting visibility.
- I The grill exhaust port cover has finger holes for easy removal.

3.4 Grill Dutch Oven Mode

With an optional Dutch oven, full-fledged oven dishes can be prepared.



<Figure 6 *Cooking with a Dutch oven*>

3.5 Designing

With advice from a design company and assistance from a glass manufacturer, two decorative designs for the top plate were created: a silver striped design that combines brightness and transparency, and a brown check design that combines elegance and a sense of quality. These give the cooking stove a novel and stylish appearance.

3.6 Other Safety Features

- I Cooking oil overheating prevention device
- I Notification by recorded messages
- I Flame failure device
- I Earthquake sensing for automatic shutoff
- I Automatic shutoff when left unattended for a long time (burner and grill)
- I Grill overheating prevention device
- I Automatic shutoff upon detection of charring
- I Ignition at the medium flame size
- I Detecting the absence of a pot on the burner
- I Locking device

4. SALES RESULTS AND USER SURVEY RESULTS

In the first six months after release, Osaka Gas shipped about 800 units and Harman Pro about 3500 units. Thus, sales have been strong.

Osaka Gas conducted a questionnaire survey on user satisfaction, with the following results.

Responses were collected from 100 users. The three

most frequently used cooking options from the new Grill *a la carte* Menu turned out to be “roasting in foil,” “roast sweet potato” and “chicken leg.” Respondents were highly satisfied with the quality of prepared dishes, and 70% expressed their intention to choose a model with an *a la carte* menu when buying cooking stove again in future.

As another novel feature, the Status Ring on the burner switch was appreciated for the ease of understanding the operation status from the display. More than 80% said they would choose a cooking stove with a status ring when buying a cooking stove again in future.

A survey on user satisfaction for different aspects of the product revealed that users are most satisfied with “safety” (97% were satisfied), while 95% were satisfied with “overall performance.”

Ass for “overall satisfaction”, more than 90% of the respondents, regardless of age group, were highly “satisfied” with the product. This seems to be due to the wide range of “convenient features” and also “safety” and “ease of use”.

5. CONCLUSION

In recent years, as a result of changing lifestyles, people are tending to spend less time for cooking at home. This has increased people’s desire to prepare tasty dishes more easily and quickly.

The gas cooking stove discussed in this paper has a Grill Auto Menu that offers 24 varieties of automated cooking in the grill, maximizing the advantage of gas cooking stoves that prepare dishes on an open flame. This feature expands the range of dishes that can be prepared, from grilled fish to full-fledged grill dishes. The automated cooking options allow busy people to save time and labor on daily cooking.

This new product was developed to revolutionize consumers' views on gas cooking stoves by delivering outstanding safety, convenience, ease of cleaning, stylishness and innovativeness. The product is the most advanced of the "Si" sensor-equipped gas cooking stoves, which are designed to compete successfully with induction electric cooking stoves.

Since "Si" sensor-equipped gas cooking stoves are a strategic product for competing with electricity, we shall continue to listen to users and develop advanced technologies and new models of these gas cooking stoves.