

Technical Disclosure Commons

Defensive Publications Series

July 2023

Stirrer with wireless communication - ID-05920

Paolo Markovina

Follow this and additional works at: https://www.tdcommons.org/dpubs_series

Recommended Citation

Markovina, Paolo, "Stirrer with wireless communication - ID-05920", Technical Disclosure Commons, (July 02, 2023)

https://www.tdcommons.org/dpubs_series/6024



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

This Article is brought to you for free and open access by Technical Disclosure Commons. It has been accepted for inclusion in Defensive Publications Series by an authorized administrator of Technical Disclosure Commons.

Stirrer With Wireless Communication

1. Summary of the disclosure

The invention disclosure the application of a multisensory solution, for the food temperature and stirring speed active monitoring and communication with induction heating cooktop appliance, by the wireless manner, in order to adjust the food heating power and stirring speed, according to the preloaded values, enabling the concept of the assisted cooking process.

Accordingly, the solution is based on the application of multisensory group, capable to measure the food temperature and stirrer rotation speed as well the cooking period, placed in one column cylindrical form, could be partially immersed in the cooked food to measure its temperature and cookware acceleration intensity that is transformable in the stirrer revolution speed.

The sensory group power supply is ensured by the TEG power generator function, uses the cookware temperature as the warm heating source and room temperature air as the cooling source. Moreover, communicating directly, in the real time, with cooktop appliance the sensory group enables regulation of the cooking power intensity and steering speed according to cooking recipes. Accordingly, the cooking process could be stopped based on cooking process status characterized by the cooking period of time, the food temperature and steering effect.

2. Applicable Patent categorization

A21C1/00	Mixing or kneading machines for the preparation of dough
A47J43/044	Implements for preparing or holding food, not provided for in other groups of this subclass
B01F27/091	Stirrer with elements co-operating with receptacle wall or bottom, e.g. for scraping the receptacle wall;
B01F33/86	Mixing heads comprising a driven stirrer.
H05B6/1236	Cooking devices - adapted to induce current in a coil to supply power to a device and electrical heating devices powered in this way.
H05B6/1209	Cooking devices - induction cooking plates or the like and devices to be used in combination with them.
A47J27/004	Cooking-vessels with integral electrical heating means (drinking cups with integral heating means A47J36/2466)
H10N10/13	Thermoelectric devices comprising a junction of dissimilar materials, i.e. devices exhibiting Seebeck or Peltier effects (integrated devices or assemblies of multiple devices, characterized by the heat-exchanging means at the junction

3. Technology domain

The present invention relates to a home appliance induction cooktop with assisted cooking feature accessory that monitor and communicate a food temperature and stirrer rotation speed in wireless manner with appliance.

4. References

1. US11025092B2 WEARABLE METABOLIC ELECTRICAL CHARGING APPARATUS

Abstract

An apparatus for providing metabolically generated electrical power to an electronic device such as, for example, a mobile phone, tablet or other device comprising a thermoelectric generator in electrical communication with a generating induction coil for wirelessly inductively providing power to the electronic device. In embodiments, the apparatus may be housed within an enclosure adapted to receive the electronic device. In an embodiment, the battery may be a mobile phone case. In an embodiment, the apparatus may further comprise a rotary lens selection feature for presenting optical lenses of varying powers to a camera of a mobile phone or tablet. In embodiments, the thermo-electronic device may be a Peltier module. A cell phone case of the invention may be adapted to receive a cell phone and may comprise a Peltier module and a generating induction coil that either powers the cell phone directly or charges the cell phone's battery.

2. EP4014811A1 MAGNETIC STIRRER

Abstract

The invention relates to a device and a method for processing, preferably stirring and/or mixing, a substance in a container by at least one magnetic tool (4) being movably insertable or being movably inserted in the container, the device comprising a worktop for contacting a section of the container, preferably at least partially a bottom wall (3B) of the container, at a first side of the worktop; at least one actuating unit for generating a magnetic field for driving the at least one magnetic tool, the at least one actuating unit (6) being arranged at a second side of the worktop opposite to the first side; and a drive unit for rotational and translational driving the at least one actuating unit. The invention relates further to a cooking apparatus and an arrangement.

3. EP3749057B1 KITCHEN APPLIANCE WITH STIRRING DEVICE

Abstract

The invention relates to a kitchen appliance comprising a cooktop for placing cookware with ferromagnetic base, an induction coil arranged underneath the cooktop for heating the base of the cookware, a spinner with at least one magnet to be inserted into the cookware, and a rotating magnetic field generator for driving the spinner. The kitchen appliance according to the invention is

characterized in that the field generator and the magnet of the spinner are arranged in repelling magnetic field configuration with respect to each other.

4. US2017202059AA INDUCTION STIRRING APPARATUS FOR INDUCTION COOKTOPS

Abstract

An induction stirring apparatus for an apparatus such as a cooktop appliance is provided. The cooking surface is equipped with a transmitter coil, and the induction stirring apparatus comprises a stirring paddle, motor, receiver coil and transformer. The motor is configured to drive a gear to turn the stirring paddle. The receiver coil is inductively couplable with the transmitter coil of the cooking surface to transfer electrical energy from the transmitter coil to the receiver coil. The transformer is coupled to and between the motor and the receiver coil. The transformer is configured to transfer the electrical energy from the receiver coil to the motor and thereby power the motor to drive the gear.

5. Problem to be solved

In order to sustain an assisted cooking process at an induction heated cooktop, the food stirring effect application besides the food cooking (heating) process is required, synchronously.

However, a both processes are to be monitored and communicated to the appliance in real time, for the scope of the heating power and steering speed control and adjustment, according to an automatic food preparation recipes, preloaded in the cooktop, where the cooktop for every recipe knows the proper temperature, steered rotation speed and cooking period of time.

Accordingly, the applied sensors and foods status monitoring and communication should be powered in wireless manner, without the application of the battery.

6. Proposed solution

The idea is to enable an assisted food cooking process, on the induction heated cooktop, by the induction food cooking (heating) and the food steering effects, a both simultaneously applied monitored by the temperature and steering effect (rotation) sensors, powered by TEG-Seeback effect generator, without the application of a battery.

ID-05920

30.06.2023

The monitored parameters must be communicated to the cooking appliance in real-time for the scope of the heating power intensity and steering rotation speed adjustment, according to preloaded set of temperature and stirring rotation speed parameters, for the specified assisted cooking process, including the food cooking status period of time (for switching of the cooking process: On/Off).

Moreover, the food temperature and steering rotation speed are to be measured by the temperature and an acceleration sensor simultaneously and constantly. A both sensors should be placed in an accessory of the cylindrical form. The temperature sensor should read the food temperature by the thermal conductive wire, integrated in the lower part of the accessory, immersed in the food (cookware).

The acceleration sensor should enable reading of steerer rotation speed, based on by steering effect generated vibrations values and their corresponding integral transformation. A both sensors, besides the food status sensor (timer) should be placed in the upper part of the accessory, together with the TEG electric power generator, the DC-DC converter and appropriate wireless communication module.

The TEG electric power generator, ought to use the hot vessel surface as warm thermal source by the temperature transfer massive cylinder (in aluminum alloy or better thermal conductive solution), while the cold thermal source would be obtained by the room air natural convection cooled heat sink, placed in the upper part of the accessory, over the TEG element itself.

7. Description

The invention discloses the method for the assisted food cooking process monitoring and communication with an induction cooktop appliance, where the food is cooked by induction heating and synchronously stirred in the suitable cookware, by the magnetic stirring element driven with a magnetic driven module, being placed under the glass ceramic plate, and the appropriate induction coil, of the induction cooktop, makes its integral part. Accordingly, the food temperature level and stirring speed effect parameters measurements are performed synchronously.

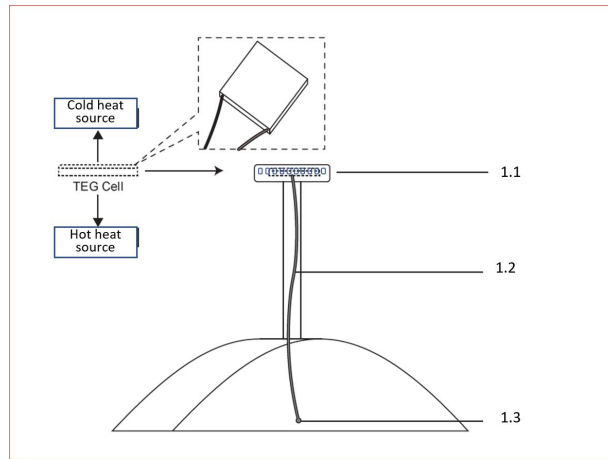
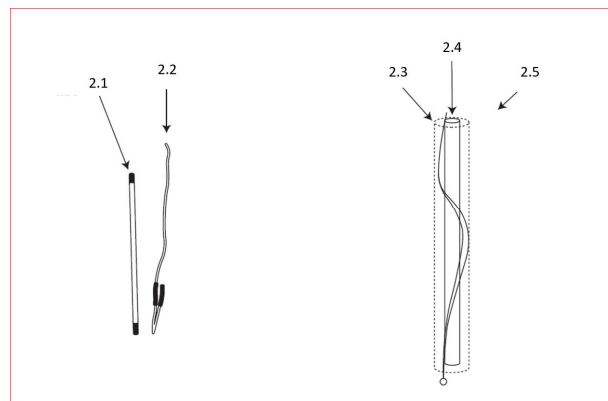


Fig.1: The food temperature and steering effect measurement accessory with the TEG electric power generation module

Moreover, the food temperature and mixing effects information are communicated to the cooktop appliance in the wireless manner in order to adapt the food heating power for the right food temperature obtainment and the suitable stirring speed correction, according the values preloaded in the cooktop appliance, for the specific food cooking recipe.

Beside of these functions, the solution should enable also the communication of the food cooking process status (duration of cooking period of time) with appliance, through the On/Off switching feature. Accordingly, the corresponding electronic modules for food status monitoring and wireless communication with induction cooktop appliance are powered by the TEG power generation module (Fig.1), enables the power supply for sensors group functionality and communication purpose, without use of battery.



ID-05920

30.06.2023

Fig.2: The food temperature sensor (NTC) with thermal conductive material and temperature transfer massive cylinder, enables the TEG warm heat source

Moreover, a both specified modules are integrated in the upper section of the accessory cylindrical form (1.1), while its lower section contains the temperature sensor NTC (2,2 and 2.5), with thermo-conductive wire material (1.2) and the temperature transfer massive cylinder (2.4), protected within the silicone tube sheath (2.1 and 2.3) with a suitable profiled terminal contact surface form that should enable a good contact heat transfer from the applied hot cookware.

The function of the TEG power generation module, based on an application of the TEG cell and Seeback's effect, is obtained through the availability of the relative hot and cold heat sources.

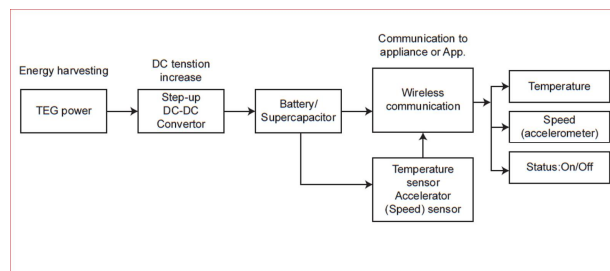


Fig.3: The functional drawing of food cooking process monitoring and communication accessory with wireless communication without battery (TEG module)

Moreover, the accessory integrates the DC-DC convertor (Fig.3) electronic circuit, should enable by TEG generated voltage suitable increase up to necessary DC-level enables the regular operation of sensory and communication groups.

Accordingly, the hot heat source is obtained by the heat transfer massive cylinder (2.4), a well dimensioned cylindrical bar in aluminum or similar thermal performances alloy, physical contact with heated cooking vessel (cookware), while the cold thermal source is obtained through the room air temperature contact with relative heat sink, placed over the TEG module (cooled by natural convection).

In accordance with previous, the solution enables the sustainment of an assisted cooking process by a simultaneously monitoring and wireless communication with induction cooking hob in order to adjust the induction heating (cooking) power to keep the specified food cooking temperature and stirring element rotation speed within

ID-05920

30.06.2023

the specified values in accordance to the pre-loaded parameters of the specific cooking recipe.

Besides this, the accessory enables to communication of the food cooking status (On-Off) with cooktop appliance and block the relative appliance (the heating and stirring effects), depending of the cooking process status.