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ROTISSERIE ASSEMBLY FOR AN OVEN APPLIANCE

Abstract

An oven appliance includes a cooking chamber positioned within a cabinet, one or more heating elements for selectively heating the cooking chamber, a rotisserie assembly comprising a spit rod rotatably mounted within the cooking chamber for receiving a food item for a rotisserie cooking process, a motor assembly for selectively rotating the spit rod, and a controller in operative communication with the motor assembly. The controller is configured to receive a user input regarding the rotisserie cooking process, operate the motor assembly to rotate the spit rod in accordance with the user input for the rotisserie cooking process, and operate the one or more heating elements to roast the food item in accordance with the user input for the rotisserie cooking process.

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Background/Summary

FIELD OF THE INVENTION

[0001] The present subject matter relates generally to oven appliances, and more particularly, to oven appliances including rotisserie assemblies.

BACKGROUND OF THE INVENTION

[0002] Conventional residential and commercial oven appliances generally include a cabinet that includes a cooking chamber for receipt of food items for cooking. Multiple heating elements are positioned within the cooking chamber to provide heat to food items located therein. The heating elements can include, for example, radiant heating elements, such as a bake heating assembly positioned at a bottom of the cooking chamber and/or a separate broiler heating assembly positioned at a top of the cooking chamber.

[0003] One traditional method of cooking is rotisserie cooking, also known as spit-roasting. This type of cooking includes skewering a food item, typically meat, on a long rod that is slowly rotated over a fire or hot coals to roast the meat slowly and evenly. For example, this type of cooking is commonly used to roast large cuts of meat, such as turkeys, hams, sirloins, whole chickens, etc. Notably, rotisserie cooking processes typically have cooking profiles that are very different than conventional oven cooking processes. For example, rotisserie cooking is typically performed in different temperature ranges, for longer times, and with specific cooking modes to slowly roast the meat while sealing in the juices and delivering an ideal rotisserie experience. Consumers who are not accustomed to this cooking style in an oven may experience a frustrating learning curve while learning oven rotisserie cooking.

[0004] Accordingly, an oven appliance that includes features that facilitate rotisserie cooking would be useful. More particularly, an oven appliance that automates a rotisserie cooking process and improves consumer satisfaction would be particularly beneficial.

BRIEF DESCRIPTION OF THE INVENTION

[0005] Aspects and advantages of the invention will be set forth in part in the following description, or may be apparent from the description, or may be learned through practice of the invention.

[0006] In one exemplary embodiment, an oven appliance is provided defining a vertical, a lateral, and a transverse direction. The oven appliance includes a cooking chamber positioned within a cabinet, one or more heating elements for selectively heating the cooking chamber; a rotisserie assembly comprising a spit rod rotatably mounted within the cooking chamber for receiving a food item for a rotisserie cooking process, a motor assembly for selectively rotating the spit rod, and a controller in operative communication with the motor assembly. The controller is configured to receive a user input regarding the rotisserie cooking process, operate the motor assembly to rotate the spit rod in accordance with the user input for the rotisserie cooking process, and operate the one or more heating elements to roast the food item in accordance with the user input for the rotisserie cooking process.

[0007] In another exemplary embodiment, a method of operating an oven appliance is provided, the oven appliance including one or more heating elements for selectively heating a cooking chamber, a rotisserie assembly comprising a spit rod rotatably mounted within the cooking chamber for receiving a food item for a rotisserie cooking process, and a motor assembly for selectively rotating the spit rod. The method includes receiving a user input regarding the rotisserie cooking process, operating the motor assembly to rotate the spit rod in accordance with the user input for the rotisserie cooking process, and operating the one or more heating elements to roast the food item in accordance with the user input for the rotisserie cooking process.

[0008] These and other features, aspects and advantages of the present invention will become better understood with reference to the following description and appended claims. The accompanying drawings, which are incorporated in and constitute a part of this specification, illustrate

embodiments of the invention and, together with the description, serve to explain the principles of the invention.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] A full and enabling disclosure of the present invention, including the best mode thereof, directed to one of ordinary skill in the art, is set forth in the specification, which makes reference to the appended figures.

[0010] FIG. **1** is a front view of an oven appliance according to an example embodiment of the present subject matter.

[0011] FIG. **2** is a perspective, cross-sectional view of the example oven appliance of FIG. **1**, taken along Line **2-2** in FIG. **1**.

[0012] FIG. **3** is a side, cross-sectional view of the example oven appliance of FIG. **1**, taken along Line **2-2** in FIG. **1**.

[0013] FIG. **4** is a perspective view of the example oven appliance of FIG. **1** with the door removed to reveal a rotisserie assembly according to an example embodiment of the present subject matter.

[0014] FIG. **5** is a perspective view of the example rotisserie assembly of FIG. **4** according to an example embodiment of the present subject matter.

[0015] FIG. **6** is an exploded view of the example rotisserie assembly of FIG. **4** according to an example embodiment of the present subject matter.

[0016] FIG. **7** is a perspective view of a spit support of the example rotisserie assembly of FIG. **4** according to an example embodiment of the present subject matter.

[0017] FIG. **8** is a front view of a rotisserie fork assembly of the example rotisserie assembly of FIG. **4** according to an example embodiment of the present subject matter.

[0018] FIG. **9** is an exploded view of the example rotisserie fork assembly of FIG. **8** according to an example embodiment of the present subject matter.

[0019] FIG. **10** is a perspective view of an outer disk of the example rotisserie fork assembly of FIG. **8** according to an example embodiment of the present subject matter.

[0020] FIG. **11** is a perspective view of an inner disk of the example rotisserie fork assembly of FIG. **8** according to an example embodiment of the present subject matter.

[0021] FIG. **12** is a perspective view of a tine of the example rotisserie fork assembly of FIG. **8** according to an example embodiment of the present subject matter.

[0022] FIG. **13** provides a method of operating an oven appliance with a rotisserie assembly according to an exemplary embodiment of the present subject matter.

[0023] FIG. **14** provides a flow chart illustrating the implementation of a rotisserie cooking process of an oven appliance with a rotisserie assembly according to an exemplary embodiment of the present subject matter.

[0024] Repeat use of reference characters in the present specification and drawings is intended to represent the same or analogous features or elements of the present invention.

DETAILED DESCRIPTION

[0025] Reference now will be made in detail to embodiments of the invention, one or more examples of which are illustrated in the drawings. Each example is provided by way of explanation of the invention, not limitation of the invention. In fact, it will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the scope or spirit of the invention. For instance, features illustrated or described as part of one embodiment can be used with another embodiment to yield a still further embodiment. Thus, it is intended that the present invention covers such modifications and variations as come within the scope of the appended claims and their equivalents.

[0026] As used herein, the terms “first,” “second,” and “third” may be used interchangeably to distinguish one component from another and are not intended to signify location or importance of the individual components. The terms “upstream” and “downstream” refer to the relative flow direction with respect to fluid flow in a fluid pathway. For example, “upstream” refers to the flow direction from which the fluid flows, and “downstream” refers to the flow direction to which the fluid flows. The terms “includes” and “including” are intended to be inclusive in a manner similar to the term “comprising.” Similarly, the term “or” is generally intended to be inclusive (i.e., “A or B” is intended to mean “A or B or both”).

[0027] Approximating language, as used herein throughout the specification and claims, is applied to modify any quantitative representation that could permissibly vary without resulting in a change in the basic function to which it is related. Accordingly, a value modified by a term or terms, such as “about,” “approximately,” and “substantially,” are not to be limited to the precise value specified. In at least some instances, the approximating language may correspond to the precision of an instrument for measuring the value. For example, the approximating language may refer to being within a 10 percent margin.

[0028] FIG. **1** provides a front view of an oven appliance **100** as may be employed with the present subject matter. In addition, FIGS. **2** and **3** provide perspective and side cross-sectional views, respectively, of oven appliance **100**. As shown, oven appliance **100** generally defines a vertical direction V, a lateral direction L, and a transverse direction T, each of which is mutually perpendicular, such that an orthogonal coordinate system is generally defined. As illustrated, oven appliance **100** includes an insulated cabinet **102**. Cabinet **102** of oven appliance **100** extends between a top **104** and a bottom **106** along the vertical direction V, between a first side **108** (left side when viewed from front) and a second side **110** (right side when viewed from front) along the lateral direction L, and between a front **112** and a rear **114** along the transverse direction T.

[0029] Within cabinet **102** is a single cooking chamber **120** which is configured for the receipt of one or more food items to be cooked. However, it should be appreciated that oven appliance **100** is provided by way of example only, and aspects of the present subject matter may be used in any suitable cooking appliance, such as a gas or electric double oven range appliance. For example, although oven appliance **100** is illustrated as a wall oven installed within a bank of cabinets, it should be appreciated that aspects of the present subject matter may be used in free-standing oven appliances, double ovens, etc. Moreover, aspects of the present subject matter may be used in any other consumer or commercial appliance where it is desirable to use a rotisserie within another suitable appliance. Thus, the example embodiment shown in FIGS. **1** through **3** is not intended to limit the present subject matter to any particular cooking chamber configuration or arrangement.

[0030] Oven appliance **100** includes a door **124** rotatably attached to cabinet **102** in order to permit selective access to cooking chamber **120**. Handle **126** is mounted to door **124** to assist a user with opening and closing door **124** in order to access cooking chamber **120**. As an example, a user can pull on handle **126** mounted to door **124** to open or close door **124** and access cooking chamber **120**. One or more transparent viewing windows **128** (FIG. **1**) may be defined within door **124** to provide for viewing the contents of cooking chamber **120** when door **124** is closed and also assist with insulating cooking chamber **120**.

[0031] In general, cooking chamber **120** is defined by a plurality of chamber walls **130** (FIGS. **2** and **3**). Specifically, cooking chamber **120** may be defined by a top wall, a rear wall, a bottom wall, and two sidewalls **130**. These chamber walls **130** may be joined together to define an opening through which a user may selectively access cooking chamber **120** by opening door **124**. In order to insulate cooking chamber **120**, oven appliance **100** includes an insulating gap defined between the chamber walls **130** and cabinet **102**. According to an exemplary embodiment, the insulation gap is filled with an insulating material **132**, such as insulating foam or fiberglass, for insulating cooking chamber **120**.

[0032] Referring now to FIG. **3**, oven appliance **100** may include a plurality of racks **140**

positioned within cooking chamber **120** for receiving food or cooking utensils containing food items. Racks **140** provide support for such food during a cooking process. According to the illustrated embodiment, racks **140** may be slidably mounted within cooking chamber **120** by one or more slide assemblies **142** that are mounted to a sidewall **130** of cooking chamber **120**. Alternatively, racks **140** may be slidably received onto embossed ribs or sliding rails such that racks **140** may be conveniently moved into and out of cooking chamber **120**.

[0033] As best shown in FIG. **3**, oven appliance may include six rack supports **144** that are spaced apart along the vertical direction V. In addition, oven appliance **100** is illustrated as including three racks **140** that may each be slidably positioned on each of the six rack supports **144**, such that six total rack positions are possible within cooking chamber **120**. However, it should be appreciated that according to alternative embodiments, any suitable number of racks mounted in cooking chamber **120** in any suitable manner and being movable between any suitable number of positions is possible and within the scope of the present subject matter.

[0034] Oven appliance may further include one or more heating elements (identified generally by reference numeral **150**) positioned within cabinet **102** or may otherwise be in thermal communication with cooking chamber **120** for regulating the temperature within cooking chamber **120**. For example, heating elements **150** may be electric resistance heating elements, gas burners, microwave heating elements, halogen heating elements, or suitable combinations thereof. According to an exemplary embodiment, oven appliance **100** is a self-cleaning oven. In this regard, heating elements **150** may be configured for heating cooking chamber **120** to a very high temperature (e.g., 800° F. or higher) in order to burn off any food residue or otherwise clean cooking chamber **120**.

[0035] Specifically, an upper gas or electric heating element **154** (also referred to as a broil heating element or gas burner) may be positioned in cabinet **102**, e.g., at a top portion of cooking chamber **120**, and a lower gas or electric heating element **156** (also referred to as a bake heating element or gas burner) may be positioned at a bottom portion of cooking chamber **120**. Upper heating element **154** and lower heating element **156** may be used independently or simultaneously to heat cooking chamber **120**, perform a baking or broil operation, perform a cleaning cycle, etc. The size and heat output of heating elements **154**, **156** can be selected based on the, e.g., the size of oven appliance **100** or the desired heat output. Oven appliance **100** may include any other suitable number, type, and configuration of heating elements **150** within cabinet **102**. For example, oven appliance **100** may further include electric heating elements, induction heating elements, or any other suitable heat generating device.

[0036] A user interface panel **160** is located within convenient reach of a user of the oven appliance **100**. For this example embodiment, user interface panel **160** includes user inputs **162** that may generally be configured for regulating heating elements **150** or operation of oven appliance **100**. In this manner, user inputs **162** allow the user to activate each heating element **150** and determine the amount of heat input provided by each heating element **150** to a cooking food items within cooking chamber **120**. Although shown with user inputs **162**, it should be understood that user inputs **162** and the configuration of oven appliance **100** shown in FIG. **1** is provided by way of example only. More specifically, user interface panel **160** may include various input components, such as one or more of a variety of touch-type controls, electrical, mechanical or electro-mechanical input devices including rotary dials, push buttons, and touch pads. User interface panel **160** may also be provided with one or more graphical display devices or display components **164**, such as a digital or analog display device designed to provide operational feedback or other information to the user such as e.g., whether a particular heating element **150** is activated and/or the rate at which the heating element **150** is set.

[0037] Generally, oven appliance **100** may include a controller **166** in operative communication with user interface panel **160**. User interface panel **160** of oven appliance **100** may be in communication with controller **166** via, for example, one or more signal lines or shared

communication busses, and signals generated in controller **166** operate oven appliance **100** in response to user input via user inputs **162**. Input/Output ("I/O") signals may be routed between controller **166** and various operational components of oven appliance **100** such that operation of oven appliance **100** can be regulated by controller **166**. In addition, controller **166** may also be communication with one or more sensors, such as temperature sensor **168** (FIG. **2**), which may be used to measure temperature inside cooking chamber **120** and provide such measurements to the controller **166**. Although temperature sensor **168** is illustrated at a top and rear of cooking chamber **120**, it should be appreciated that other sensor types, positions, and configurations may be used according to alternative embodiments.

[0038] Controller **166** is a "processing device" or "controller" and may be embodied as described herein. Controller **166** may include a memory and one or more microprocessors, microcontrollers, application-specific integrated circuits (ASICS), CPUs or the like, such as general or special purpose microprocessors operable to execute programming instructions or micro-control code associated with operation of oven appliance **100**, and controller **166** is not restricted necessarily to a single element. The memory may represent random access memory such as DRAM, or read only memory such as ROM, electrically erasable, programmable read only memory (EEPROM), or FLASH. In one embodiment, the processor executes programming instructions stored in memory. The memory may be a separate component from the processor or may be included onboard within the processor. Alternatively, controller **166** may be constructed without using a microprocessor, e.g., using a combination of discrete analog and/or digital logic circuitry (such as switches, amplifiers, integrators, comparators, flip-flops, AND gates, and the like) to perform control functionality instead of relying upon software.

[0039] Referring still to FIG. **1**, a schematic diagram of an external communication system **190** will be described according to an exemplary embodiment of the present subject matter. In general, external communication system **190** is configured for permitting interaction, data transfer, and other communications between and among oven appliance **100** and/or a user of oven appliance **100**. For example, this communication may be used to provide and receive operating parameters, cycle settings, performance characteristics, user preferences, or any other suitable information for improved performance of oven appliance **100**. In addition, external communication system **190** may be used to transfer images or video to a user of oven appliance **100**.

[0040] External communication system **190** permits controller **166** of oven appliance **100** to communicate with external devices either directly or through a network **192**. For example, a consumer may use a consumer device **194** to communicate directly with oven appliance **100**. Alternatively, these appliances may include user interfaces for receiving such input (described below). For example, consumer devices **194** may be in direct or indirect communication with oven appliance **100**, e.g., directly through a local area network (LAN), Wi-Fi, Bluetooth, Zigbee, etc. or indirectly through network **192**. In general, consumer device **194** may be any suitable device for providing and/or receiving communications, displaying images or video, or receiving commands from a user. In this regard, consumer device **194** may include, for example, a personal phone, a tablet, a laptop computer, or another mobile device.

[0041] In addition, a remote server **196** may be in communication with oven appliance **100** and/or consumer device **194** through network **192**. In this regard, for example, remote server **196** may be a cloud-based server **196**, and is thus located at a distant location, such as in a separate state, country, etc. In general, communication between the remote server **196** and the client devices may be carried via a network interface using any type of wireless connection, using a variety of communication protocols (e.g. TCP/IP, HTTP, SMTP, FTP), encodings or formats (e.g. HTML, XML), and/or protection schemes (e.g. VPN, secure HTTP, SSL).

[0042] In general, network **192** can be any type of communication network. For example, network **192** can include one or more of a wireless network, a wired network, a personal area network, a local area network, a wide area network, the internet, a cellular network, etc. According to an

exemplary embodiment, consumer device **194** may communicate with a remote server **196** over network **192**, such as the internet, to provide user inputs, transfer operating parameters or performance characteristics, cycle authorizations, display images or video, etc. In addition, consumer device **194** and remote server **196** may communicate with oven appliance **100** to communicate similar information.

[0043] External communication system **190** is described herein according to an exemplary embodiment of the present subject matter. However, it should be appreciated that the exemplary functions and configurations of external communication system **190** provided herein are used only as examples to facilitate description of aspects of the present subject matter. System configurations may vary, other communication devices may be used to communicate directly or indirectly with one or more oven or cooking appliances, other communication protocols and steps may be implemented, etc. These variations and modifications are contemplated as within the scope of the present subject matter.

[0044] Referring now generally to FIGS. **4** through **12**, a rotisserie assembly **200** that may be used with oven appliance **100** will be described according to an example embodiment of the present subject matter. Although rotisserie assembly **200** is described herein as being used with oven appliance **100**, it should be appreciated that rotisserie assembly **200** may be used with other cooking appliances while remaining within the scope of the present subject matter. For example, rotisserie assembly **200** may be used with a range oven appliance, a double oven appliance, an oven appliance having a different configuration, or within any other suitable cooking cavity. The example embodiment described herein is not intended to limit the scope of the present subject matter in any manner.

[0045] As explained above, rotisserie cooking may commonly include the cooking of relatively large food items by mounting them on a spit and slowly rotating the spit within a heated cavity or over a heat source to roast the food item slowly and evenly. Although the rotisserie processes described herein are discussed with respect to large cuts of meat, such as turkeys, hams, or chickens, it should be appreciated that the cooking process described herein may be used for any suitable food item. In addition, the source of heat may vary while remaining within the scope of the present subject matter.

[0046] In general, rotisserie assembly **200** may include a rotisserie rack **202** that is slidably mounted within cooking chamber **120**. In this regard, for example, sidewalls **130** of cooking chamber **120** may define a dedicated rack support **144** to facilitate the rotisserie cooking process. For example, this rack support **144** may include embossed ribs that are defined at a lower end of cooking chamber **120**, e.g., below all other conventional rack supports **144**. In addition, it should be appreciated that rotisserie rack **202** may be omitted altogether and rotisserie assembly **200** may be configured for directly mounting to other suitable features within cooking chamber **120**, e.g., such as mounting brackets defined on a bottom chamber walls **130**. Other variations and modifications are possible and within the scope of the present subject matter.

[0047] As best shown in FIGS. **4** through **6**, rotisserie rack **202** may generally define a central aperture **204** that is positioned within the center of rotisserie rack **202**. A drip tray **206** may be configured for seating within central aperture **204** where it may be supported by a perimeter wire **208**. In this manner, drippings from the food items cooking during the rotisserie cooking process may fall into and collect within drip tray **206** for easy removal and cleaning. In addition, drip tray **206** may be configured for receipt of water or another suitable fluid that is heated and provides moisture into cooking chamber **120** throughout the rotisserie cooking process.

[0048] Rotisserie rack **202** may further define a plurality of standoff feet **210** that extend from a bottom of rotisserie rack **202**. For example, rotisserie rack **202** is illustrated as defining four standoff feet **210** that are evenly spaced along a bottom of rotisserie rack **202** for providing firm footing or support for rotisserie rack **202**. These standoff feet **210** may permit a user to set rotisserie rack **202** directly on a countertop while it is still warm after a rotisserie cooking process. According

to an example embodiment, instead of rotisserie rack **202** being mounted on rack supports **144** of cooking chamber **120**, rotisserie rack **202** can alternatively be mounted directly to bottom chamber wall **130** where it is supported by standoff feet **210**.

[0049] Referring now generally to FIGS. **4** through **7**, rotisserie assembly **200** may further include a first spit support **220** and a second spit support **222** that are mounted in cooking chamber **120** and are spaced apart along the lateral direction L. According to the illustrated embodiment, first spit support **220** and second spit support **222** are mounted directly to rotisserie rack **202** and extend along the vertical direction V for supporting a spit rod **224**, as described in more detail below. However, it should be appreciated that according to alternative embodiments, first spit support **220** and second spit support **222** may be mounted directly to one or more chamber walls **130** of cooking chamber **120**.

[0050] In general, each of first spit support **220** and second spit support **222** may include a front vertical arm **226** and a rear vertical arm **228** that are spaced apart along the transverse direction T. In addition, a cross arm **230** may extend along the transverse direction T between a distal end of front vertical arm **226** and rear vertical arm **228**. In general, cross arm **230** may be configured for directly receiving spit rod **224** such that spit rod **224** is freely rotatable about an axial direction A (e.g., corresponding to the lateral direction L in the illustrated embodiment). It should be appreciated that the structure of first spit support **220** and second spit support **222** may vary to support spit rod **224** in other manners while remaining within the scope of the present subject matter.

[0051] According to the illustrated embodiment, rotisserie assembly **200** may further include a spit support bracket **232** that is attached to the bottom or proximal end of each of first spit support **220** and second spit support **222**. More specifically, spit support brackets **232** may be positioned at the bottom of each front vertical arm **226** and a rear vertical arm **228** for directly engaging rotisserie rack **202**. Specifically, as illustrated, spit support brackets **232** define a U-shaped receiving channel **234** that slides onto a wire of rotisserie rack **202** for providing vertical support. In addition, each spit support bracket **232** may define a threaded aperture **236** that passes through receiving channel **234**. A screw **238** (e.g., such as a set screw) may be configured for receipt within threaded aperture **236** to secure spit support brackets **232** directly to rotisserie rack **202**. It should be appreciated that other manners of attaching front vertical arm **226** and rear vertical arm **228** are possible and within the scope of the present subject matter.

[0052] As explained briefly above, spit rod **224** may generally be rotatably supported by first spit support **220** and second spit support **222**. Spit rod **224** may generally define an axial direction A about which spit rod **224** is rotated during the rotisserie cooking process and a radial direction R that extends perpendicular to axial direction A. Notably, first spit support **220**, second spit support **222**, and spit rod **224** may generally define complementary features for ensuring smooth rotation of spit rod **224** and preventing spit rod **224** from translating along the axial direction A or falling off during the rotisserie cooking process. For example, first spit support **220** and second spit support **222** may generally define receiving slots **240** within which spit rod **224** may be securely seated. For example, receiving slots **240** may be V-shaped bends or indentations in each of first spit support **220** and second spit support **222**. In addition, spit rod **224** may define two necked regions **242** where a diameter of spit rod **224** is reduced such that spit rod **224** engages first spit support **220** and second spit support **222** while preventing translation along the axial direction A.

[0053] Referring now to FIG. **5**, rotisserie assembly **200** may further include a motor assembly **250** for engaging and selectively rotating spit rod **224** when spit rod **224** is in an installed position. In this regard, for example, motor assembly **250** may be positioned or mounted against chamber wall **130** on an outside of cooking chamber **120** and may be in operative communication with controller **166**. Motor assembly **250** may include an engagement bushing **252** that is seated at least partially within cooking chamber **120** and that is configured for securely receiving spit rod **224** (e.g., through a keyed engagement structure). In this manner, motor assembly **250** may be thermally

isolated from cooking chamber **120** but may rotate engagement bushing **252** and spit rod **224**.
[0054] To install rotisserie assembly **200**, a user may slide rotisserie rack **202** and spit rod **224** into cooking chamber **120** (e.g., along rack support **144**). Notably, the rack support **144** associated with the rotisserie cooking process may be positioned at a predetermined height relative to engagement bushing **252** such that spit rod **224** is aligned along vertical direction V with engagement bushing **252** as rotisserie rack **202** is pushed into cooking chamber **120**. A user may manually move spit rod **224** along the axial direction A slightly to align spit rod **224** and engagement bushing **252** before pressing spit rod **224** into engagement with engagement bushing **252**. By contrast, to remove rotisserie assembly **200**, a user may slide spit rod **224** away from engagement bushing **252** and may remove rotisserie rack **202**.
[0055] Notably, it may be desirable to verify the proper installation of spit rod **224** within engagement bushing **252** prior to initiating a rotisserie cooking process. Accordingly, rotisserie assembly **200** may further include a microswitch **254** that is in operative communication with controller **166** for detecting when spit rod **224** is properly installed. For example, microswitch **254** may be a mechanical trigger, a button, a hall effect sensor, or any other device suitable for detecting the proper positioning of spit rod **224** and the engagement with motor assembly **250**. If microswitch **254** determines that spit rod **224** is not properly installed, controller **166** may provide a user notification and request proper installation prior to initiating a rotisserie cooking process.
[0056] According to example embodiments of the present subject matter, rotisserie assembly **200** may further include a rotisserie fork assembly **260** that is mounted on spit rod **224** for securing one or more food items onto spit rod **224**. In this regard, rotisserie fork assembly **260** may be configured to prevent rotation of the food items relative to spit rod **224**, such that rotation of spit rod **224** causes corresponding rotation and cooking of the food items. Notably, as explained briefly above, conventional rotisserie forks are stationary or fixed structures that are sized for receiving food items of particular size. However, as food items cooking with rotisserie assembly **200** may vary, it is desirable to have a rotisserie fork assembly **260** that may be modified to properly support various food items. Although an exemplary rotisserie fork assembly **260** is described below, it should be appreciated that variations and modifications may be made while remaining within the scope of the present subject matter. Moreover, although a single rotisserie fork assembly **260** is described, it should be appreciated that rotisserie assembly **200** may include two or more rotisserie fork assemblies **260** (e.g., as shown for example in FIG. **4**).
[0057] According to the illustrated embodiment, rotisserie fork assembly **260** may generally be mounted on spit rod **224** such that is slidable along the axial direction A. In addition, rotisserie fork assembly **260** may include a plurality of tines **262** that are adjustable along the radial direction R. More specifically, referring now also to FIGS. **8** through **12**, rotisserie fork assembly **260** generally includes an inner disk **264** and an outer disk **266** that are joined to secure tines **262** in a desired radial position. Notably, tines **262** may all be fixed at the same radial position or at different radial positions depending on the uniformity of the food item being cooked. In addition, tines **262** may generally be L-shaped and define a pointed end **268** that is designed to pierce and secure food items.
[0058] According to the illustrated embodiment, inner disk **264** and outer disk **266** may generally define a plurality of annular grooves **270** where each of the annular grooves **270** define a different diameter measured along the radial direction R. In general, tines **262** extend between a proximal end that defines a mounting stud **272** and a distal end that defines pointed end **268**. The geometry of inner disk **264**, outer disk **266**, and mounting studs **272** are designed to secure tines **262** in a fixed axial and radial position when properly installed.
[0059] In this regard, for example, at least one of inner disk **264** and outer disk **266** may define a keyed surface **274** for engaging the mounting stud **272** and preventing its rotation about the radial direction R. For example, according to the illustrated embodiment, mounting stud **272** may be a hexagonal tip and the keyed surface **274** may be a flat face defined on the inner disk **264**.

Accordingly, when the inner disk **264** and outer disk **266** are secured together, tine **262** may not rotate relative to inner disk **264** and outer disk **266**. As best shown in FIGS. **9** and **11**, inner disk **264** may further define a plurality of radial notches **276** or recesses that are configured for receiving the plurality of tines **262**, e.g., such that tines **262** may pass through a perimeter of inner disk **264** into annular grooves **270**.

[0060] Referring now specifically to FIGS. **9** through **11**, inner disk **264** and outer disk **266** may be configured for threaded engagement, e.g., whereby tines **272** are secured within annular grooves **270** and axial movement between inner disk **264** and outer disk **266** is prevented. In this regard, according to the illustrated embodiment, inner disk **264** may generally define male threads **280** and outer disk **266** may define female threads **282**. Accordingly, when a user has position tines **272** against keyed surface **274** and in the desired radial position, outer disk **266** may be rotated on to inner disk **264** to secure all components of rotisserie fork assembly **260**.

[0061] In addition, at least one of the inner disk **264** or outer disk **266** may define a keyed aperture **284** that is generally configured for receiving spit rod **224**. For example, spit rod **224** may define a hexagonal cross-section that is configured for receipt through keyed aperture **284** to prevent relative rotation between spit rod **224** and rotisserie fork assembly **260**. In addition, in order to secure the axial position of rotisserie fork assembly **260** on spit rod **224**, at least one of the inner disk **264** and outer disk **266** may define a threaded radial aperture **286** that is generally configured for receiving a set screw **288**. In this manner, a user may slide rotisserie fork assembly **260** along the axial direction A until the desired position is achieved and then may pass set screw **288** through threaded radial aperture **286** until it engages spit rod **224** to fix the axial position of rotisserie fork assembly **260**.

[0062] Notably, it may be desirable to have temperature feedback during the rotisserie cooking process. Accordingly, rotisserie assembly **200** may further include a temperature sensor or a temperature probe **290** that is configured for being inserted into the food item for measuring an internal temperature of the food item. Controller **166** may be in operative communication with temperature probe **290** for receiving real time temperature feedback and regulating the operation of heating elements **150**, motor assembly **250**, and other aspects of the rotisserie cooking operation.

[0063] As used herein, “temperature sensor” or the equivalent is intended to refer to any suitable type of temperature measuring system or device positioned at any suitable location for measuring the desired temperature. Thus, for example, temperature probe **290** may each be any suitable type of temperature sensor, such as a thermistor, a thermocouple, a resistance temperature detector, a semiconductor-based integrated circuit temperature sensor, etc. In addition, temperature probe **190** may be positioned at any suitable location and may output a signal, such as a voltage, to a controller that is proportional to and/or indicative of the temperature being measured. Although exemplary positioning of temperature sensors is described herein, it should be appreciated that oven appliance **100** may include any other suitable number, type, and position of temperature, humidity, and/or other sensors according to alternative embodiments.

[0064] Now that the construction of oven appliance **100** and the configuration of controller **166** according to exemplary embodiments have been presented, an exemplary method **300** of operating an oven appliance including a rotisserie assembly will be described. Specifically, method **300** may be used to perform a rotisserie cooking process of an oven appliance, such as the oven appliance **100**. Although the discussion below refers to the exemplary method **300** of operating oven appliance **100**, one skilled in the art will appreciate that the exemplary method **300** is applicable to the operation of a variety of other oven appliances, such as oven range appliances. In exemplary embodiments, the various method steps as disclosed herein may be performed by controller **166** or a separate, dedicated controller.

[0065] Specifically, referring now specifically to FIG. **13**, method **300** includes, at step **310**, receiving a user input regarding a rotisserie cooking process using a rotisserie assembly in an oven appliance. In this regard, for example, a user may manipulate user interface panel **160** (or may

provide input via a remote device **194**) to provide cooking information associated with the rotisserie cooking process. For example, the user input may include at least one of a food type, a food weight, a target doneness, a basting schedule, or any other information that may be used to facilitate an improved rotisserie cooking process. The user may then be instructed to install rotisserie assembly **200**, e.g., by installing food items on spit rod **224** using rotisserie fork assembly **260**, sliding in rotisserie rack **202**, and engaging spit rod **224** with motor assembly **250**.

[0066] Step **320** may generally include determining whether a spit rod is installed using a microswitch and providing a user notification if the spit rod is not installed. In this regard, step **320** may be used to verify the proper installation of rotisserie assembly **200** before initiating a rotisserie cooking process. Controller **166** may provide instructions to the user if spit rod **224** is not properly installed or other input or manipulations need to be made prior to initiating the rotisserie cooking process. If the microswitch is triggered, controller **166** may initiate the rotisserie cooking process.

[0067] Step **330** may generally include operating the motor assembly to rotate the spit rod in accordance with the user input for the rotisserie cooking process. In this regard, once all the desired input is received and the rotisserie assembly **200** is properly installed, controller **166** may operate motor assembly **250** to begin rotating spit rod **224** and food items positioned thereon. According to an example embodiment, the rotational speed may be varied throughout the rotisserie cooking process, e.g., based on the food type/weight, the chamber temperature, the internal temperature, and other factors.

[0068] Step **340** may include operating one or more heating elements to roast the food item in accordance with user input for the rotisserie cooking process. In this regard, controller **166** may regulate the heat output of one or more heating elements **150** throughout the rotisserie cooking process to achieve the desired cooking of the food item. The heating elements **150** and their heating output may be modulated throughout the cooking cycle, e.g., according to a predetermined heating schedule.

[0069] Step **350** may generally include determining that the rotisserie cooking process is completed. For example, the rotisserie cooking process may be a time-based process where cooking is complete at a predetermined time after cooking at a predetermined temperature. By contrast, step **350** may include determining that the internal temperature of the food item has reached a target temperature, e.g., using temperature probe **290**.

[0070] Step **360** may generally include turning off the one or more heating elements at the end of the rotisserie cooking process and operating the motor assembly to continue rotating the spit rod during a resting period. In this regard, the resting period is intended to allow the juices to redistribute prior to removing the food item from rotisserie assembly **200**. Step **370** may generally include providing a user notification when the resting period is complete (e.g., via a user interface panel **160** or remote device **194**).

[0071] Referring now briefly to FIG. **14**, an exemplary flow diagram of a rotisserie cooking process **400** that may be implemented by oven appliance **100** will be described according to an exemplary embodiment of the present subject matter. According to exemplary embodiments, method **400** may be similar to or interchangeable with method **300** and may be implemented by controller **166** of oven appliance **100**. As shown, at step **402**, a user may select the rotisserie mode through a user interface panel **160** or remote device **194**. Step **404** may include obtaining user input, e.g., regarding food type and other cooking details. Step **406** may include checking status microswitch to determine whether rotisserie assembly **200** and spit rod **224** are properly installed. If the microswitch is open (indicating that spit rod **224** is not installed) a user notification may be provided at step **408**.

[0072] Step **410** may generally include the initiation of the rotisserie cooking process, e.g., by starting one or more heating elements **150**. Method **400** may then take different routes depending on whether the cooking process is time-based or temperature based. For example, for a temperature-based process, heat is maintained until the temperature measured by the temperature

probe reaches a target temperature. After the target internal temperature is reached, step **414** may indicate a searing process where broil element is turned on for a brief period of time. Step **416** may include determining whether the internal temperature has reached another predetermined target temperature. If it has not, step **418** may include maintaining the broil element on until a predetermined amount of time has passed. After the predetermined amount of time has passed, step **420** may include performing another convection bake cycle at a predetermined temperature level until another predetermined target temperature is reached at step **422**. Step **424** may include shutting off heating elements **150** and the rotating of motor assembly **250** for a predetermined resting period.

[0073] Referring now to a time-based process (e.g., illustrated on the right in FIG. **14**), a timer may be initiated at step **410** at the initiation of a convection bake process. Step **430** illustrates the commencement of a broiling or searing process after the convection bake process has completed (e.g., 60 minutes at 425° F.). Step **432** includes the shutting off heating elements **150** and the continued rotation of spit rod **224** for a resting period. Step **440** includes stopping rotation of spit rod **224** and providing a user notification (e.g., via a user interface panel **160** or remote device **194**) that the food items are ready for removal from cooking chamber **120**. Other steps are possible and within the scope of the present subject matter.

[0074] FIGS. **13** and **14** depict steps performed in a particular order for purposes of illustration and discussion. Those of ordinary skill in the art, using the disclosures provided herein, will understand that the steps of any of the methods discussed herein can be adapted, rearranged, expanded, omitted, or modified in various ways without deviating from the scope of the present disclosure. Moreover, although aspects of method **300** and method **400** are explained using oven appliance **100** as an example, it should be appreciated that this method may be applied to the operation of any suitable oven appliance and rotisserie assembly.

[0075] As explained herein, aspects of the present subject matter are generally directed to an oven appliance and a rotisserie oven mode algorithm that may utilize a wireless temperature probe to implement specific oven modes and cycles that adjust to the temperature of the food thereby creating an optimal user-friendly experience. A microswitch may be incorporated into a rotisserie motor to detect whether a rotisserie spit rod is correctly engaged and to start the rotisserie cycle. When a user selects the rotisserie mode, the oven may check whether the spit rod is correctly inserted or not and notify the user if the spit is not inserted correctly. The main source of heat for most of the cooking events may be convection bake or similar oven mode (convection roast/bake, etc.). The wireless temperature probe may constantly monitor the temperature, and once the temperature of the wireless probe is within a predetermined range, the oven may change over to broil mode (finishing heating to sear the outer surface of the food for a short time) or similar oven mode where the heat is delivered more directly to the food. If the wireless probe has not measured a temperature that meets the target temperature after that time limit is reached, it may go back to the previous oven mode until that temperature is reached. Once the time/temperature is reached, the heater may be stopped (e.g., no heat is applied to the food) and the food may continue to rotate for a predetermined amount of time, therefore allowing the food to absorb the juices before it is cut up. In addition, the users may be allowed to adjust the algorithm and use it for other foods.

[0076] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they include structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

Claims

1. An oven appliance defining a vertical, a lateral, and a transverse direction, the oven appliance comprising: a cooking chamber positioned within a cabinet; one or more heating elements for selectively heating the cooking chamber; a rotisserie assembly comprising a spit rod rotatably mounted within the cooking chamber for receiving a food item for a rotisserie cooking process; a motor assembly for selectively rotating the spit rod; and a controller in operative communication with the motor assembly, the controller being configured to: receive a user input regarding the rotisserie cooking process; operate the motor assembly to rotate the spit rod in accordance with the user input for the rotisserie cooking process; and operate the one or more heating elements to roast the food item in accordance with the user input for the rotisserie cooking process.
2. The oven appliance of claim 1, wherein the user input comprises at least one of a food type, a food weight, or a target doneness.
3. The oven appliance of claim 1, wherein the controller is configured to switch a heating output of the one or more heating elements during the rotisserie cooking process in accordance with the user input.
4. The oven appliance of claim 3, wherein the controller is further configured to: operate the motor assembly to adjust a rotation speed of the spit rod based on the heating output of the one or more heating elements.
5. The oven appliance of claim 1, wherein the one or more heating elements comprise a bake heating element and a broil heating element, and wherein the controller is configured to switch between operation of the bake heating element and the broil heating element during the rotisserie cooking process in accordance with the user input.
6. The oven appliance of claim 1, further comprising: a temperature probe configured for measuring a temperature of the food item, wherein the controller is configured to adjust the rotisseries cooking process based on the temperature of the food item.
7. The oven appliance of claim 1, further comprising: a microswitch operably coupled to the motor assembly for detecting installation of the spit rod.
8. The oven appliance of claim 7, wherein the controller is in operative communication with the microswitch, the controller being configured to: determine that the spit rod is not installed; and provide a user notification that the spit rod is not installed.
9. The oven appliance of claim 1, wherein the controller is further configured to: turn off the one or more heating elements at an end of the rotisserie cooking process; and operate the motor assembly to continue rotating the spit rod during a resting period.
10. The oven appliance of claim 9, wherein the resting period is between about 10 minutes and 1 hour.
11. The oven appliance of claim 9, wherein the controller is further configured to: provide a user notification when the resting period is complete.
12. A method of operating an oven appliance, the oven appliance comprising one or more heating elements for selectively heating a cooking chamber, a rotisserie assembly comprising a spit rod rotatably mounted within the cooking chamber for receiving a food item for a rotisserie cooking process, and a motor assembly for selectively rotating the spit rod, the method comprising: receiving a user input regarding the rotisserie cooking process; operating the motor assembly to rotate the spit rod in accordance with the user input for the rotisserie cooking process; and operating the one or more heating elements to roast the food item in accordance with the user input for the rotisserie cooking process.
13. The method of claim 12, wherein the user input comprises at least one of a food type, a food weight, or a target doneness.
14. The method of claim 12, further comprising: switching a heating output of the one or more

heating elements during the rotisserie cooking process in accordance with the user input.

15. The method of claim 14, further comprising: operating the motor assembly to adjust a rotation speed of the spit rod based on the heating output of the one or more heating elements.

16. The method of claim 12, wherein the one or more heating elements comprise a bake heating element and a broil heating element, the method further comprising: switching between operation of the bake heating element and the broil heating element during the rotisserie cooking process in accordance with the user input.

17. The method of claim 12, wherein the oven appliance further comprises a temperature probe configured for measuring a temperature of the food item, the method further comprising: adjusting the rotisseries cooking process based on the temperature of the food item.

18. The method of claim 12, the oven appliance further comprising a microswitch operably coupled to the motor assembly for detecting installation of the spit rod, the method further comprising: determining that the spit rod is not installed; and providing a user notification that the spit rod is not installed.

19. The method of claim 12, further comprising: turning off the one or more heating elements at an end of the rotisserie cooking process; and operating the motor assembly to continue rotating the spit rod during a resting period.

20. The method of claim 19, further comprising: providing a user notification when the resting period is complete.