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(54) **FULL-VIEW OVEN DOORS HAVING LOCKING MECHANISMS**

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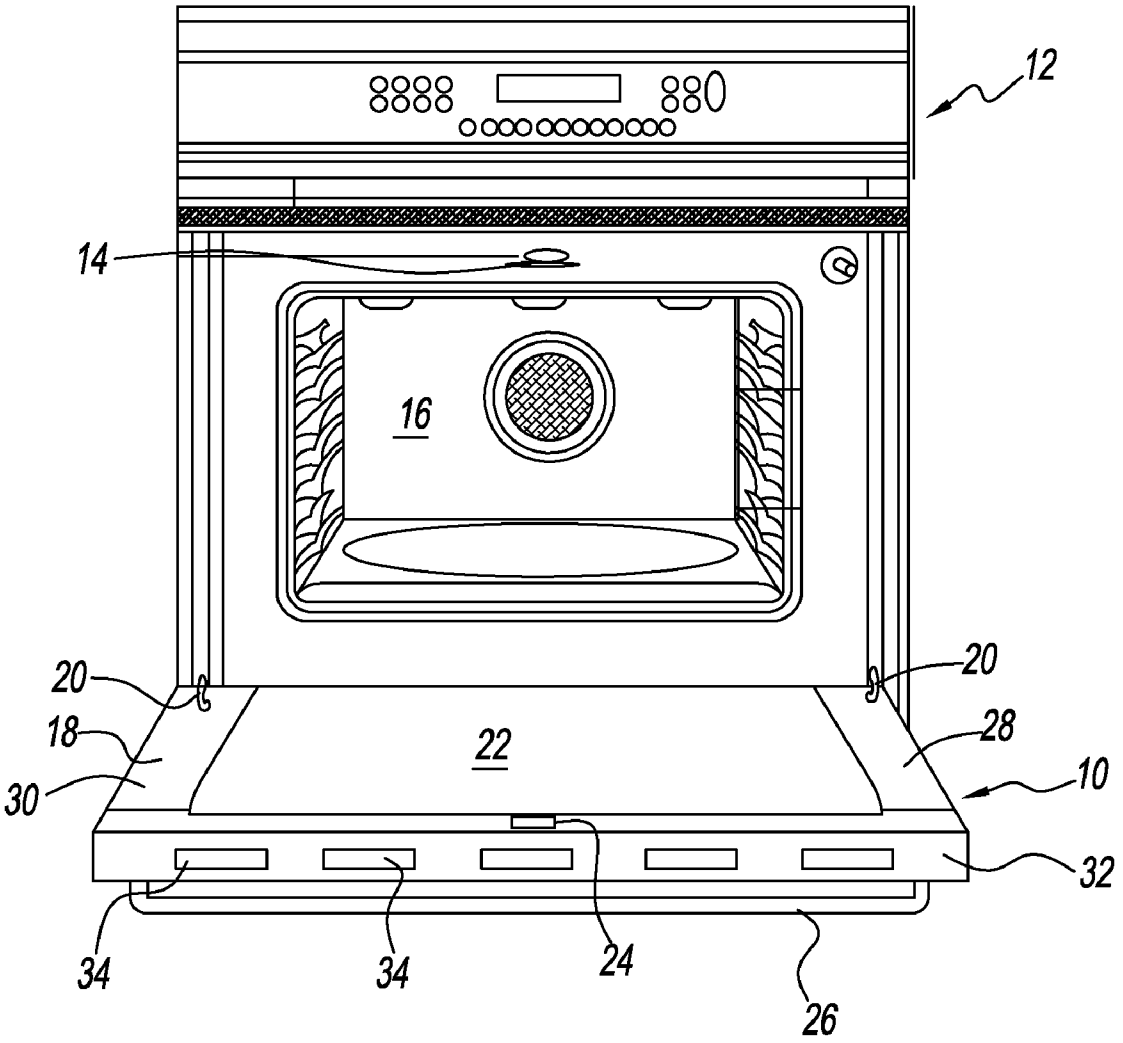
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(57) **ABSTRACT**

An oven door including a frame including a shroud and a pair of side rails for holding in place a glass pane; a hinge for securing the frame to an oven; and a mechanism for holding the oven door in a closed position relative to the oven, in which the glass pane provides a full view of the interior contents of the oven when the oven door is in the closed position.



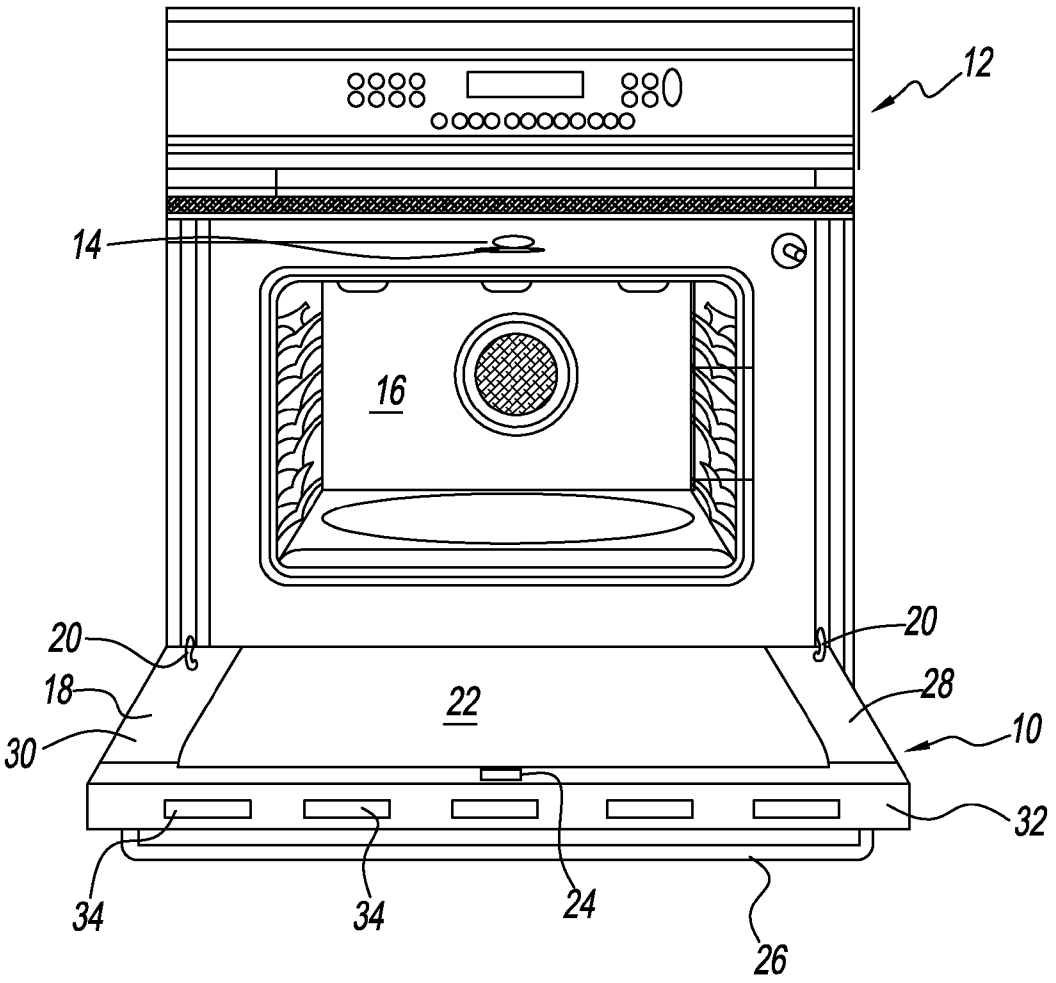


Fig. 1

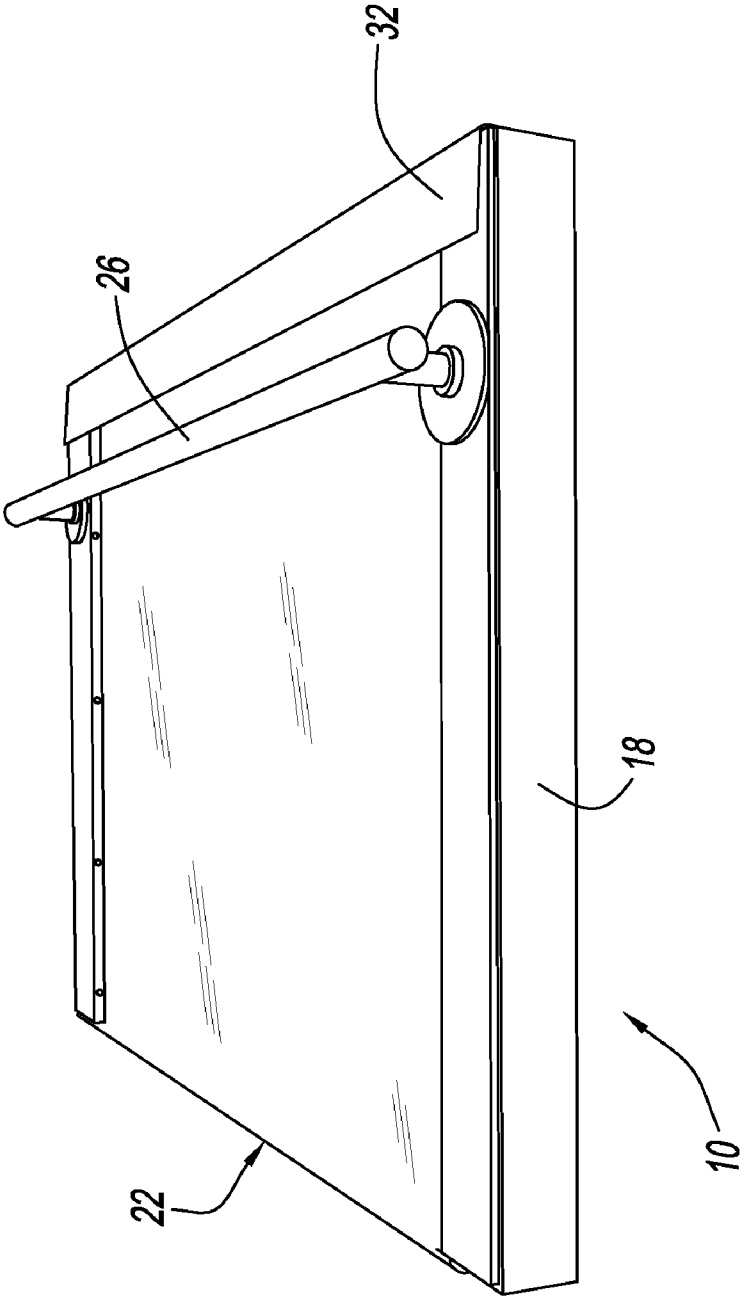


Fig. 2

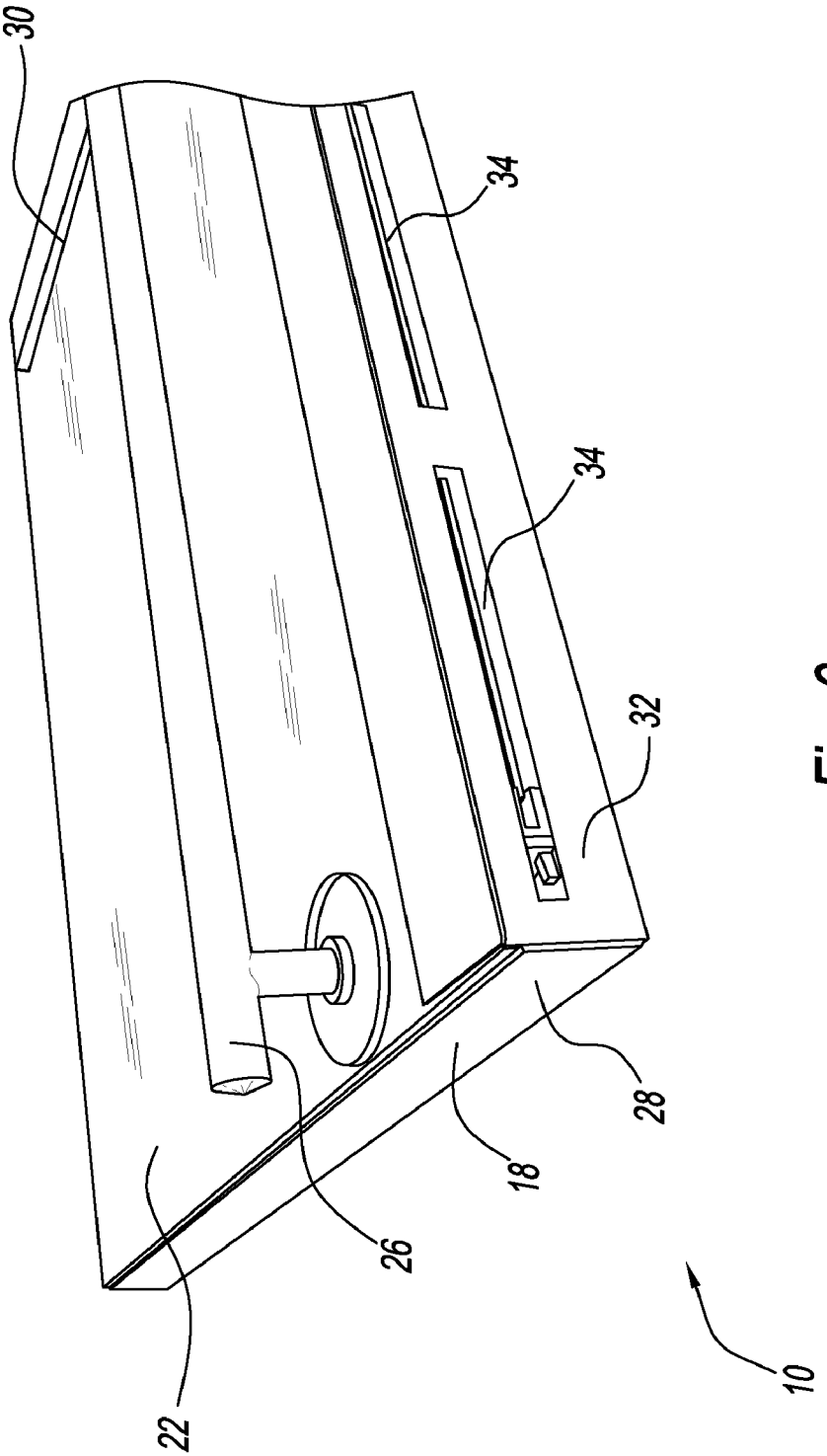


Fig. 3

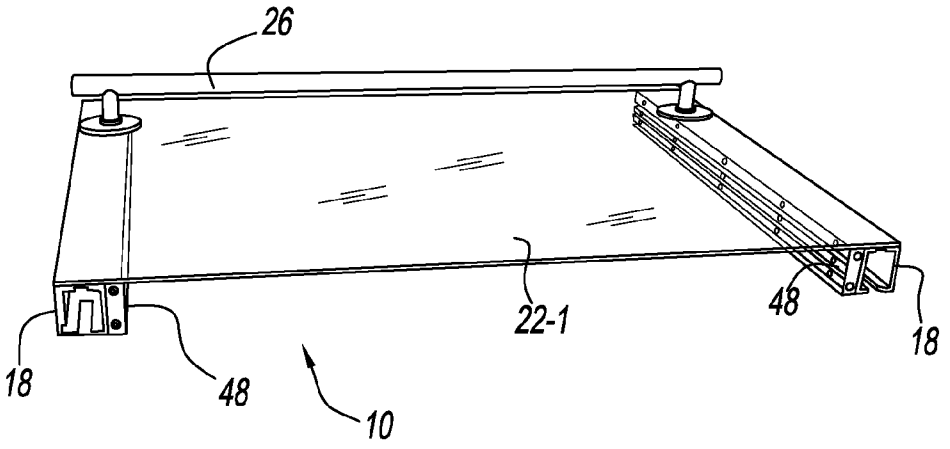


Fig. 4

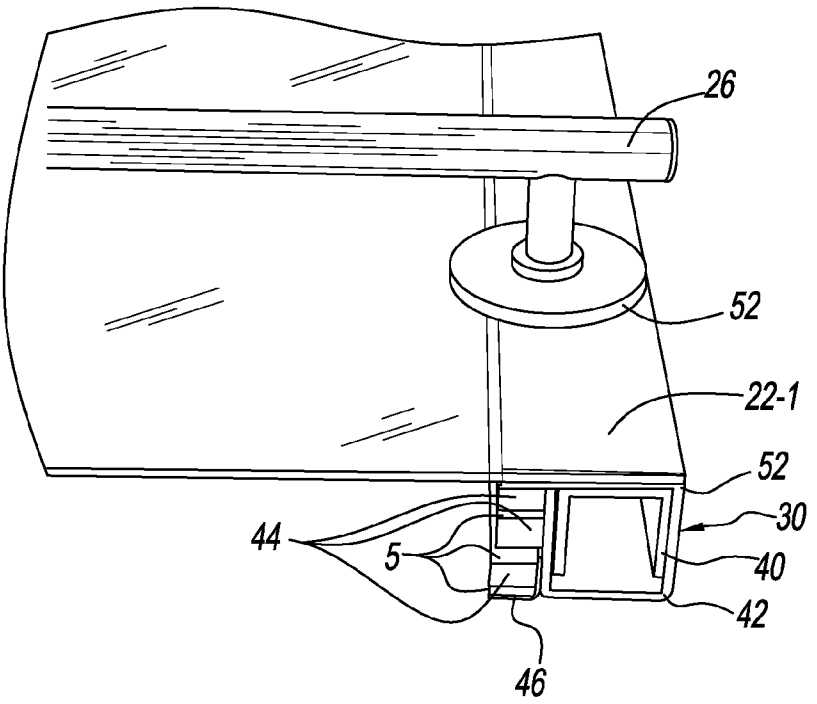


Fig. 5

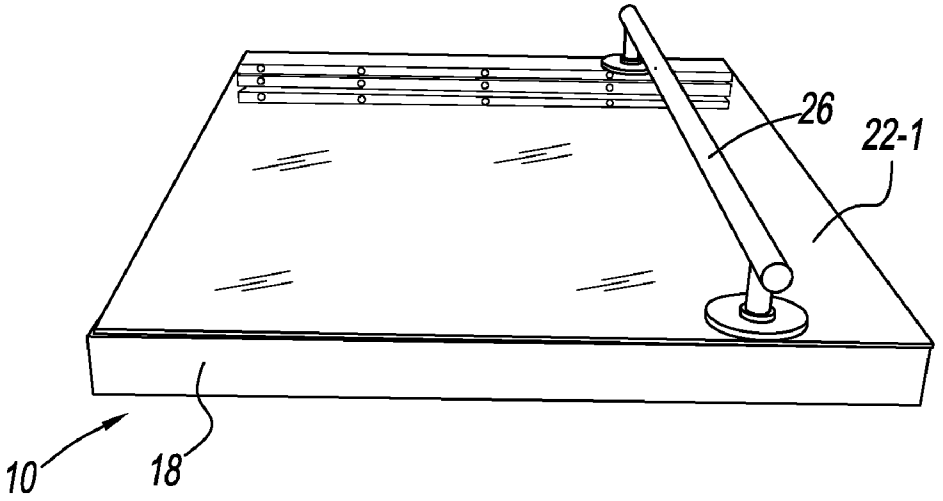


Fig. 6

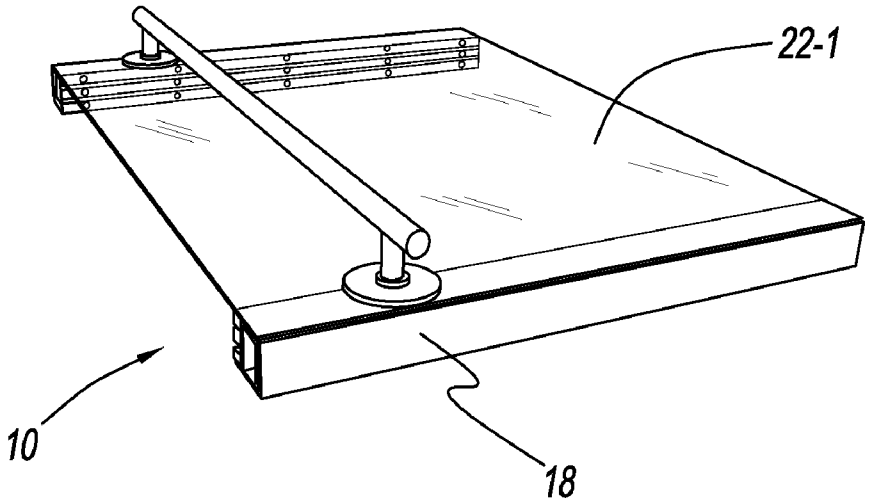


Fig. 7

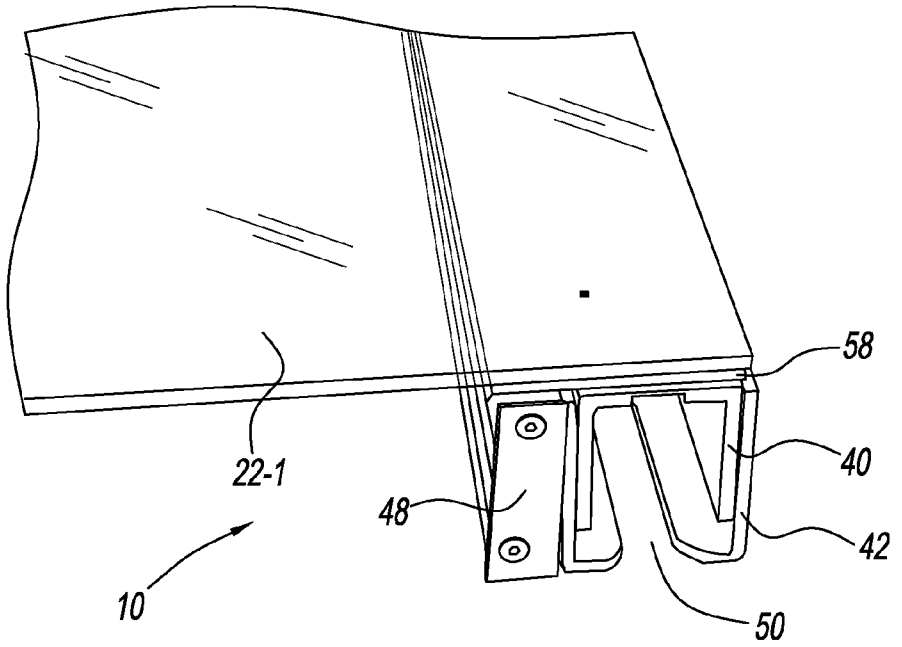


Fig. 8

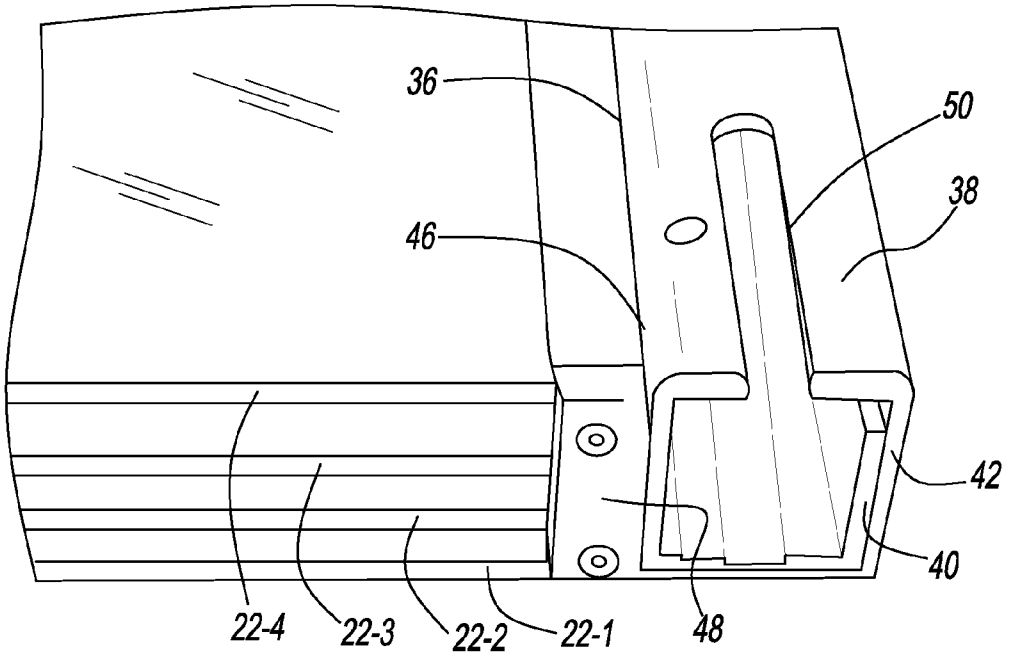


Fig. 9

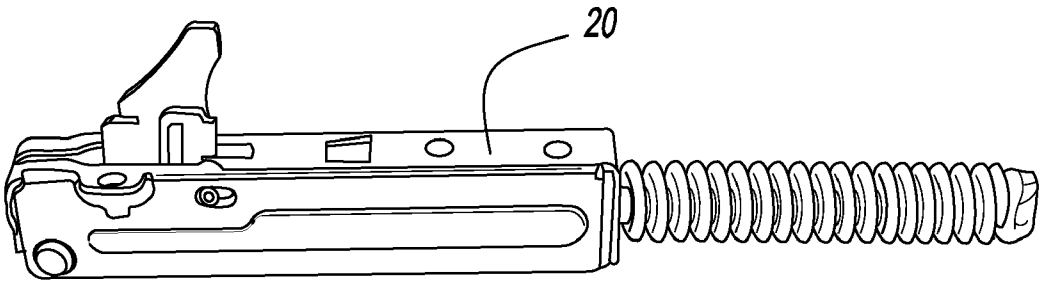


Fig. 10

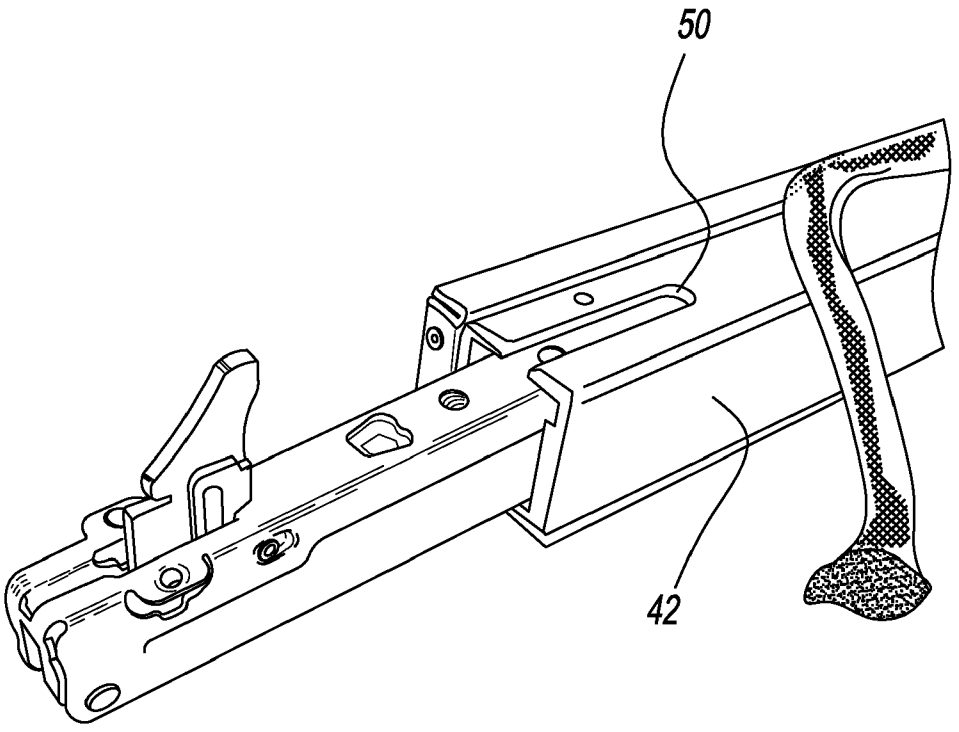


Fig. 11

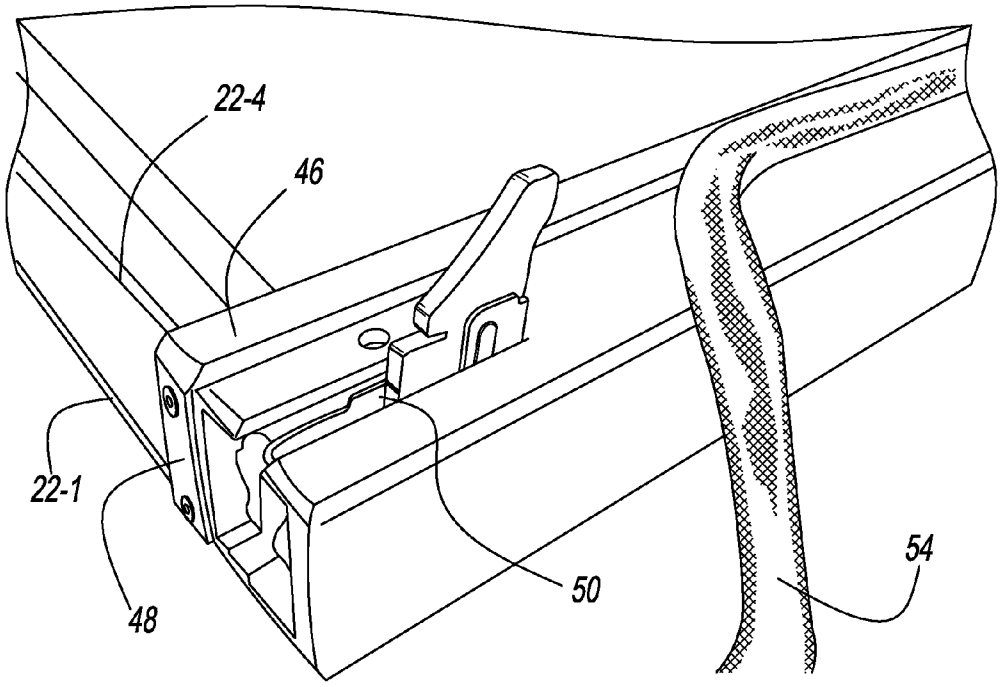


Fig. 12

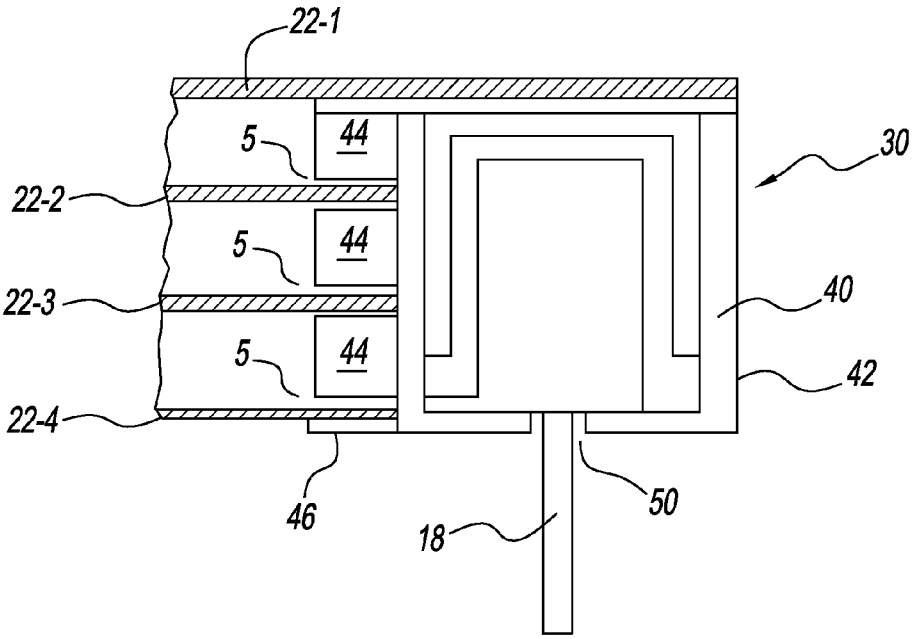


Fig. 13

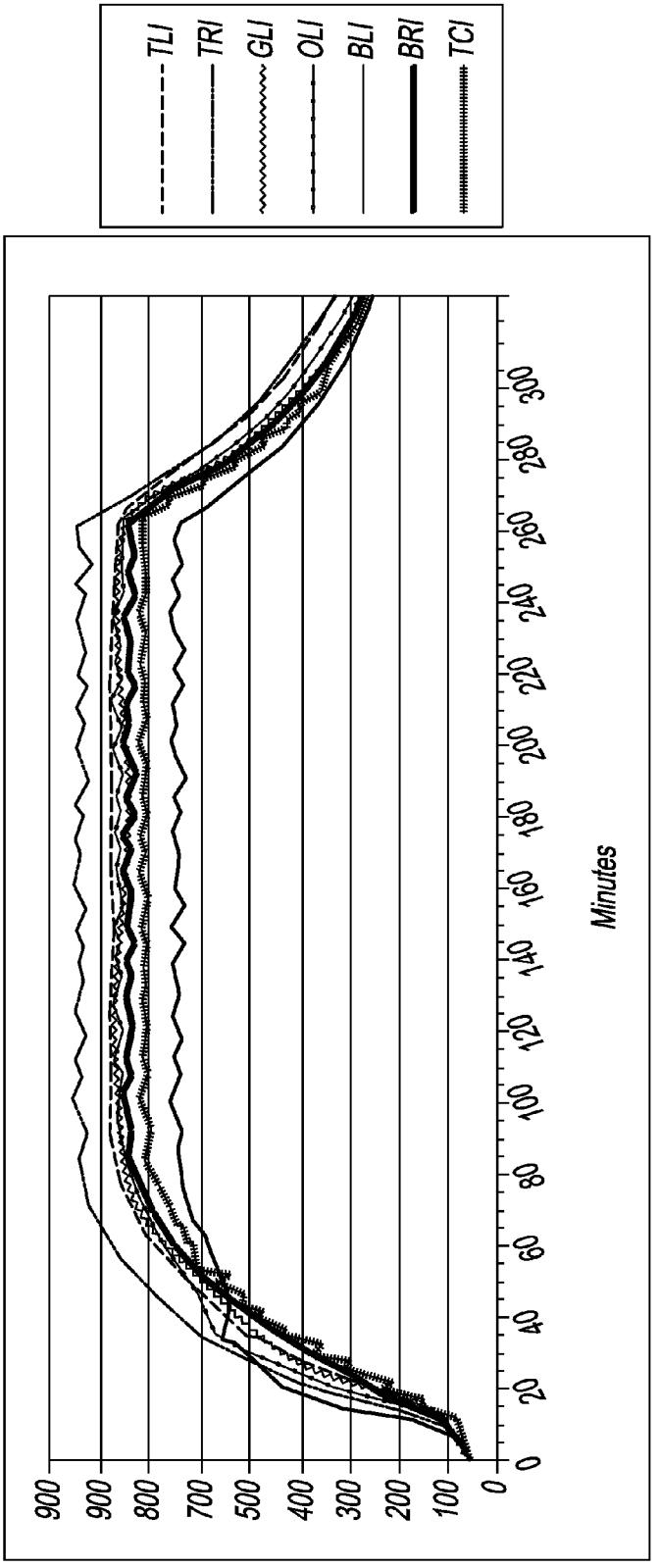

TLI
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Fig. 14

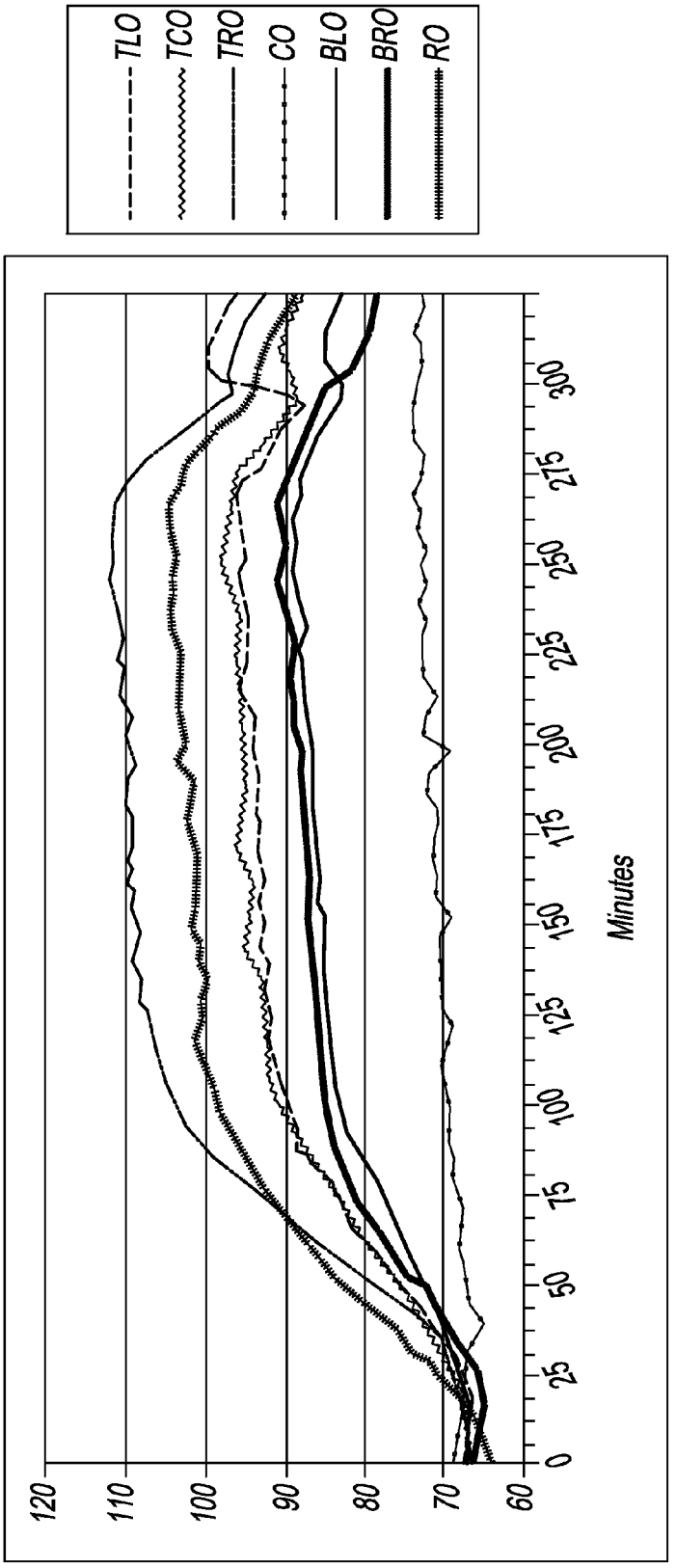

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Fig. 15

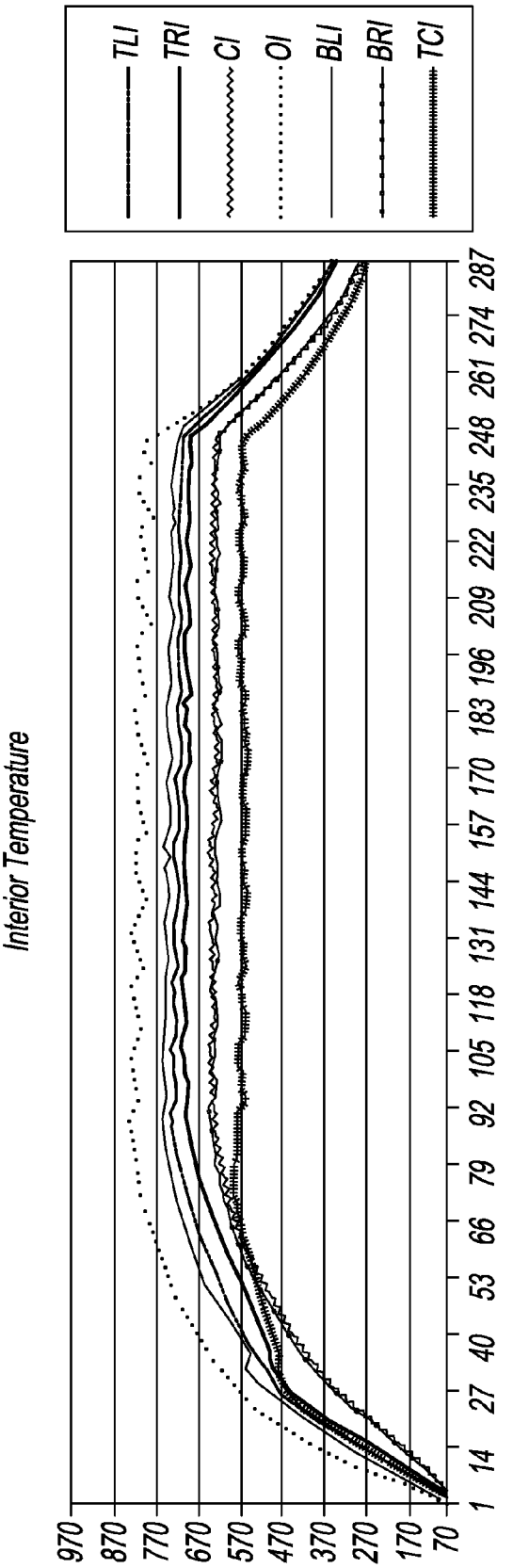

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Interior Temperature
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Fig. 16

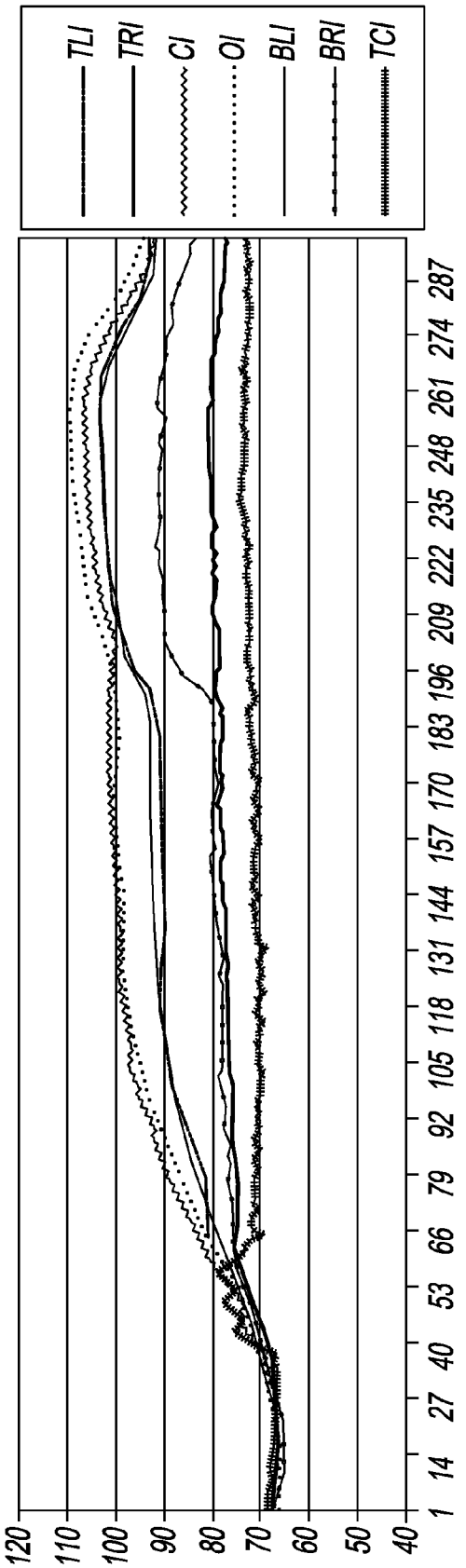

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Fig. 17

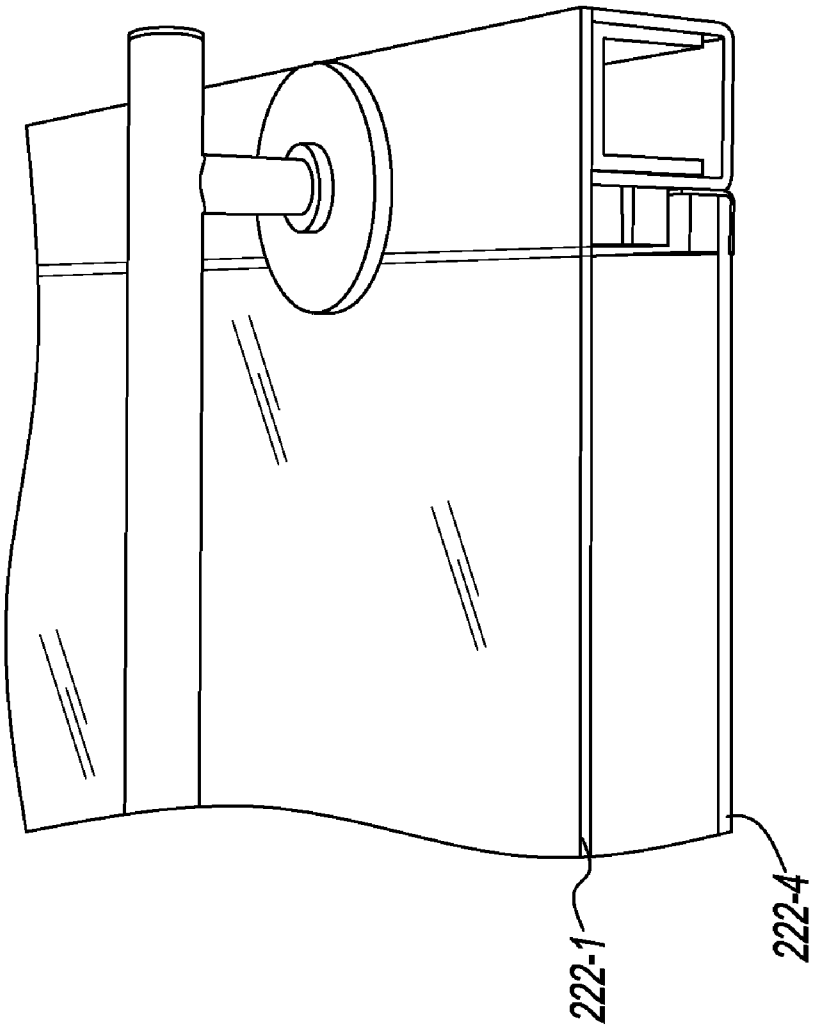


Fig. 18

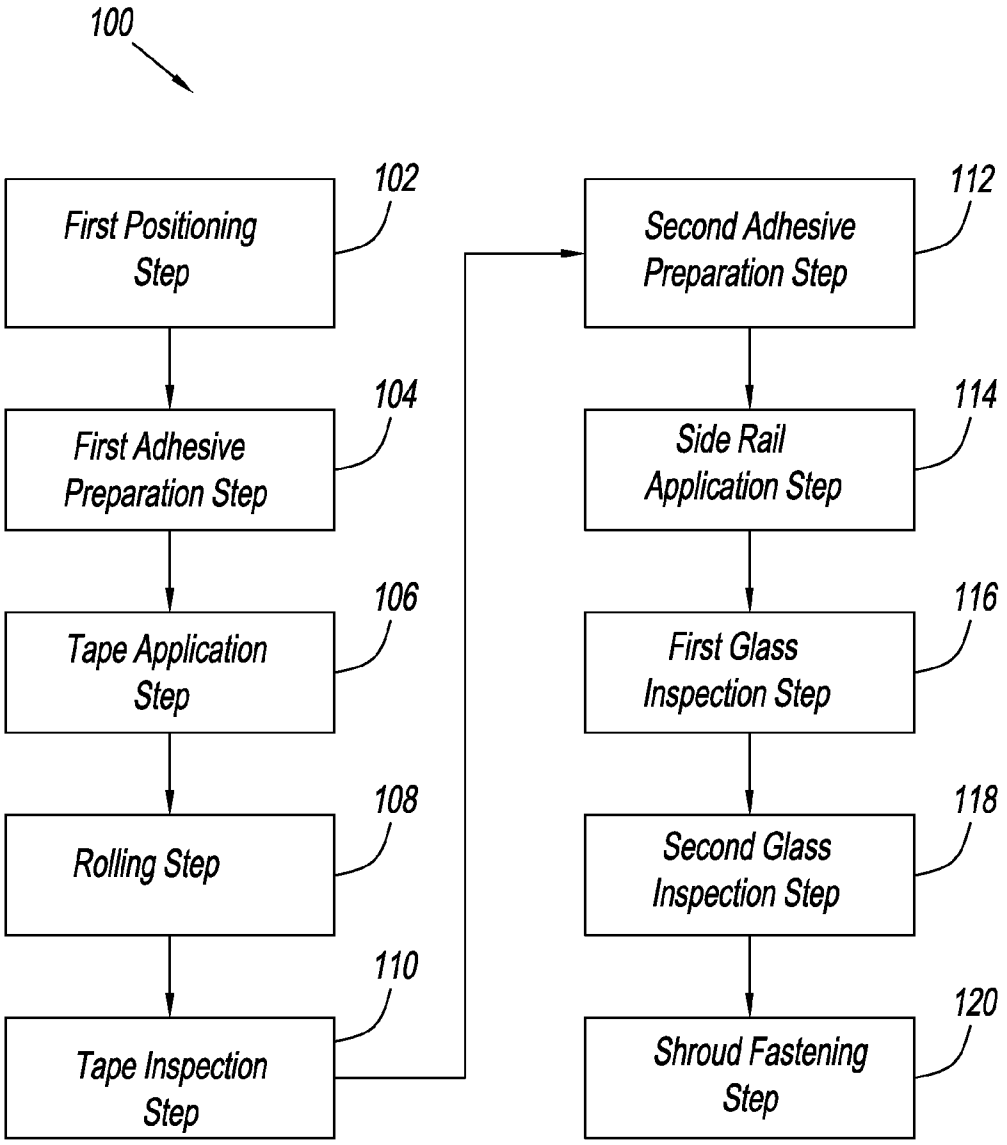

100
First Positioning Step
102
First Adhesive Preparation Step
104
Tape Application Step
106
Rolling Step
108
Tape Inspection Step
110
Second Adhesive Preparation Step
112
Side Rail Application Step
114
First Glass Inspection Step
116
Second Glass Inspection Step
118
Shroud Fastening Step
120

Fig. 19

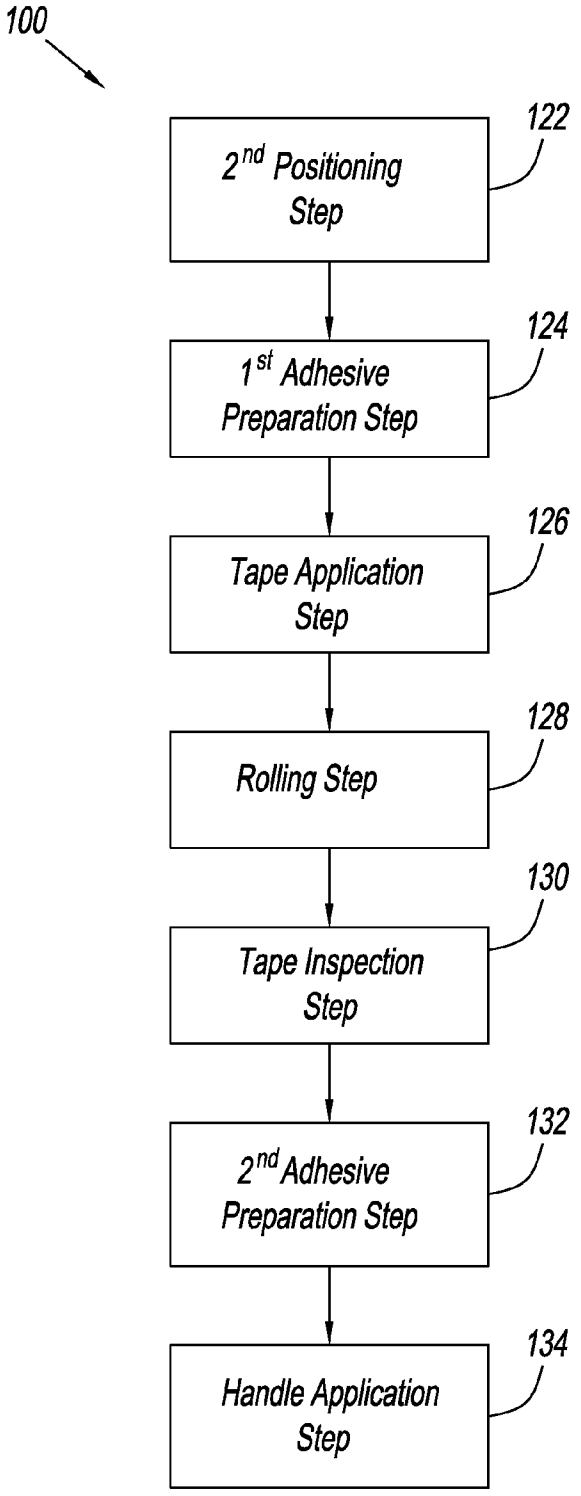

100
2nd Positioning Step
122
1st Adhesive Preparation Step
124
Tape Application Step
126
Rolling Step
128
Tape Inspection Step
130
2nd Adhesive Preparation Step
132
Handle Application Step
134

Fig. 20

FULL-VIEW OVEN DOORS HAVING LOCKING MECHANISMS

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation International Application Serial No. PCTUS0944012 filed May 14, 2009, now pending, the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present disclosure is related to oven doors. More particularly, the present disclosure is related to oven doors that have locking mechanisms and a glass panel that provides a full view of the interior content of an oven when the oven door is in a closed position.

[0004] 2. Description of Related Art

[0005] Most residential and professional kitchens include one or more ovens having an oven door through which contents can be placed into the oven. The oven door includes a door-frame that has a hinge, an exterior handle, a gasket or seal, a locking mechanism, and, often a small window.

[0006] The hinge pivotally secures the frame of the door to the oven. The exterior handle allows the user to open and close the door by pivoting the door about the hinges. The gasket or seal seals the frame to the wall of the oven when in the closed position to reduce the heat transfer between the frame and the oven wall. The small window allows a partial view of the contents of the oven can be seen.

[0007] Unfortunately, the structural and functional requirements of the door-frame have previously only allowed oven windows of a small size. The small size of the prior art oven windows can result in an obstructed view of the inside of the oven and can result in poor lighting of the interior contents. Thus, prior art oven users have found it difficult to see the contents during the cooking process.

[0008] Currently, oven doors are assembled utilizing a number of parts that are susceptible to degradation over time when in the presence of high temperatures. This is especially prevalent in ovens that utilize a self-clean cycle in which temperatures are ordinarily much higher than those typically used during the cooking process. The wear and tear of degradation undesirably results in repair costs and/or replacement of the oven in whole.

[0009] Accordingly, it has been determined by the present disclosure that there is a need for oven doors that overcome, alleviate and/or mitigate one or more or other deleterious effects of prior art oven doors.

BRIEF SUMMARY OF THE INVENTION

[0010] An oven door including a frame including a shroud and a pair of side rails for holding in place a glass pane; a hinge for securing the frame to an oven; and a mechanism for holding the oven door in a closed position relative to the oven, in which the glass pane provides a full view of the interior contents of the oven when the oven door is in the closed position.

[0011] A method for assembling an oven door, including applying a first exposed side of an adhesive tape to an edge of an outer glass pane; rolling the adhesive tape on the outer glass pane; applying a pair of hinges to a second exposed side of adhesive tape; inserting a first single sided low-e glass with the coating facing up; inserting two pieces of double coated low-e glass; and securing a handle to the outer glass panel with the adhesive tape.

[0012] The above-described and other features and advantages of the present invention will be appreciated and understood by those skilled in the art from the following detailed description, drawings, and appended claims.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0013] FIG. **1** is a view of an exemplary embodiment of an interior side of an oven door according to the present disclosure in combination with a prior art oven, the door being shown in an open position.

[0014] FIG. **2** is a side perspective view of an exterior side of the oven door of FIG. **1**.

[0015] FIG. **3** is a top perspective view of the exterior side of the oven door of FIG. **1**.

[0016] FIG. **4** is a bottom perspective view of the exterior side of the oven door of FIG. **1** in a partially assembled state.

[0017] FIG. **5** is a top perspective view of the exterior side of the oven door of FIG. **1** in the partially assembled state.

[0018] FIG. **6** is a first side perspective view of the exterior side of the oven door of FIG. **1** in the partially assembled state.

[0019] FIG. **7** is a second side perspective view of the exterior side of the oven door of FIG. **1** in the partially assembled state.

[0020] FIG. **8** is a bottom perspective view of the exterior side of the oven door of FIG. **1** illustrating a side rail portion of the door in the partially assembled state.

[0021] FIG. **9** is a bottom perspective view of the interior side of the oven door of FIG. **1** illustrating the side rail portion in the partially assembled state.

[0022] FIG. **10** is a perspective of a hinge mechanism for use with the oven door according of FIG. **1**.

[0023] FIG. **11** is a view of the side rail portion of FIG. **9** having the hinge mechanism of FIG. **10** during assembly.

[0024] FIG. **12** is a view of the side rail portion of FIG. **9** having the hinge mechanism of FIG. **10** after assembly.

[0025] FIG. **13** is a section view taken along lines **13-13** of FIG. **12**.

[0026] FIGS. **14** and **15** are graphs illustrating a comparison of the temperatures on the inside and outside of a prior art oven door during a typical a self-cleaning cycle.

[0027] FIGS. **16** and **17** are graphs illustrating a comparison of the temperatures on the inside and outside of the oven door of FIG. **1** during the typical a self-cleaning cycle.

[0028] FIG. **18** is an alternative embodiment of the oven door according to the present disclosure.

[0029] FIG. **19** is an exemplary embodiment of a method according to the present disclosure of assembling an oven door according to the present disclosure.

[0030] FIG. **20** is an alternative exemplary embodiment of a method according to the present disclosure of assembling an oven door according the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

[0031] Referring to the drawings and in particular to FIGS. **1** through **3**, an exemplary embodiment of a full-view oven door **10** according to the present disclosure is shown in combination with a prior art oven **12**. In FIG. **1**, door **10** is shown in an open position.

[0032] Advantageously, oven door **10** eliminates the need for costly and complex glass, glass seals, and glass spacers of the prior by using a simple combination of four glass sheets held in place by metallic spacers. It has been determined by the present disclosure that door **10** having the simple combination of four panes of glass spaced apart by metallic spacers provides excellent thermal properties without the need for the expensive low expanding glasses of the prior art and eliminates the need for the expensive and complex high temperature plastic molded parts of the prior art. Moreover, oven door **10** provides a full-view oven door wherein essentially the entire interior of the oven cavity can be viewed and yet allows the oven to include a high temperature self-cleaning cycle.

[0033] As used herein, "full-view" as defined in the present disclosure means a complete, unobstructed view of the entirety of the interior of the oven from any visual angle outside of the oven door. As used herein, "transparency" means light transmission. "Translucent" means surface area that allows light there through. As used herein, the term self-cleaning cycle refers to a cycle of oven **12**, wherein the oven increases its internal temperatures to more than 600° F. (degrees Fahrenheit) and more commonly more than 800° F. for a predetermined period of time, such as about three to four hours, so as to burn off or pyrolitically clean the interior surfaces of the oven. In the United States, the Underwriters Laboratory (UL) Standards for Safety require ovens having such self-cleaning cycle capability to include a door that is locked during the cleaning cycle to prevent inadvertent exposure to the cleaning cycle temperatures.

[0034] Advantageously, oven door **10** also functions with oven **12** having a door lock or holder **14** and is capable of withstanding the high temperatures of such self-cleaning cycles. Thus, door **10** not only provides a full-view of the inside **16** of oven **12**, but also allows for use of the self-cleaning cycle of the oven.

[0035] As illustrated in FIGS. **1** through **3**, oven door **10** includes a frame **18**, a pair of hinges **20**, one or more glass panes **22**, a lock opening **24**, and, preferably, a handle **26**.

[0036] Frame **18** includes a first side rail **28**, a second side rail **30**, and a shroud **32**. Hinges **20** extend from first and second side rails **28**, **30** so as to engage with oven **12** in a known manner. In the illustrated embodiment, hinges **20** are known lift off hinges. The oven door **10** is virtually entirely translucent in that the glass portion is translucent but the shroud **32** and first and second side rails **28**, **30** are not translucent.

[0037] Shroud **32** includes one or more vent openings **34** disposed therein. Vent openings **34** provide fluid communication between ambient room air and spaces between the one or more glass panes **22**. Additionally, shroud **32** includes lock opening **24**, which is configured for receipt of lock **14** defined in oven **12**. In this manner, door **10** is UL compliant when used with oven **12** having a self-cleaning cycle.

[0038] In use, shroud **32** is configured to engage oven electronics such as light switch (not shown) and/or lock **14**. Thus, shroud **32** is preferably formed of a material having sufficient rigidity to engage lock **14**. In a preferred embodiment, shroud **32** is a stamped metal shroud such as brushed stainless steel.

[0039] The detailed construction of the exemplary embodiment of door **10** is described by way of simultaneous reference to FIGS. **4** through **13**.

[0040] In the illustrated embodiment, door **10** includes four glass panes **22**, namely a first or outer glass pane **22-1**, a second or inside or "inner" glass pane **22-4**, a third or middle glass pane **22-2**, and a fourth or middle glass pane **22-3** best seen in FIGS. **9** and **13**.

[0041] Glass panes **22** can be any glass suitable for use with the temperatures of oven **12**. In preferred embodiment, outer glass pane **22-1** is a non-reflective decorative glass pane made of an uncoated sheet of common 0.125 clear float glass. Third and fourth glass panes **22-2** and **22-3** are a low-emissive glass panes having a soda-lime glass sheet with a metal-oxide coating (not shown) on one side. Preferably, third and fourth glass panes **22-2**, **22-3** are positioned in door **10** such that the coating faces the interior **16** of oven **12**. Advantageously, glass panes **22** have a uniform transparency.

[0042] Inner glass pane **22-4** is a low-emissive glass pane having a soda-lime glass sheet with a metal-oxide coating on each side. Thus, inner glass pane **22-4** is positioned in door **10** such that coating faces both the interior **16** of oven **12**, while the other coating faces the exterior of the oven.

[0043] It should be recognized that frame **18** and glass panes **22** are described herein as being made of particular materials. Of course, it is contemplated by the present disclosure for frame **18** and panes **22** to be made of any known material suitable for use with the temperatures and stresses generated by oven **12**.

[0044] In a preferred embodiment shown in FIG. **9**, inner glass pane **22-4** has an inner surface **36** that is substantially planar to an inner surface **38** of frame **18**. It has been determined by the present disclosure that maintaining inner surfaces **36** and **38** substantially planar to one another advantageously allows door **1**- to be useable as a work surface when the door is opened. For example, when checking the internal temperature of a roast the user can temporarily rest the cooking pan containing the roast on inside surfaces **36**, **38** with the substantially planar surface providing a stable support surface of the pan.

[0045] As shown in FIGS. **10** through **12**, hinge **20** may be any known hinge in the art suitable for connecting oven door **10** to oven **12**. For example, it is contemplated herein that hinge **18** may be, by way of example, a spring arm hinge or a cam-arm hinge.

[0046] Side rails **28**, **30** are described with reference to FIGS. **5** and **13**. The side rails **28** and **30** are mirror images of one another and, thus, for purposes of clarity only a detail description of side rail **30**. As seen in FIG. **1**, the distance between the side rails is no less than the opening in the oven.

[0047] Side rail **30** includes an inner U-shaped channel **40**, an outer U-shaped channel **42**, a plurality of spacer bars **44**, an L-shaped channel **46**, and a bottom bar **48**. Outer U-shaped channel **42** includes a slot **50** positioned and configured to receive hinge **18**.

[0048] Inner U-shaped channel **40**, as well as handle **26** and one of spacer bars **44**, are connected to outer glass pane **22-1** by way of adhesive tape **52**. Here, channel **40** is secured to glass pane **22-1** so that the open face of the u-shaped channel faces away from the outer glass pane. Outer U-shaped channel **42** is secured over inner u-shaped channel **40** to define a substantially rectangular opening therein.

[0049] Adhesive tape **52** can be any adhesive tape sufficient to withstand the thermal stresses imparted to door **10** by oven **12**, as well as the mechanical stresses imparted to door **10** during use of the oven. In a preferred embodiment, tape **52** is a double coated acrylic foam tape such as, but not limited to, VHB™ tape that is commercially available from the Minnesota Mining and Manufacturing or 3M™ Company.

[0050] Spacer bars **44** and L-shaped channel **46** are secured to a side of outer U-shaped channel **40** to define a plurality of pane receiving slots (S). Slots S are positioned and configured to loosely receive glass panes **22-2**, **22-3**, and **22-4** therein. Preferably, spacer bars **44** and L-shaped channel **46** are mechanically fastened to channel **40** such as by one or more machine screws (not shown), which can in some embodiments also secure outer U-shaped channel **42** to inner U-shaped channel **40**. Similarly, bottom bar **48** is mechanically fastened to spacer bars **44** such as by one or more machine screws (not shown). It should be recognized that bars **48**, **44** and channels **40**, **42**, **46** are described above by way of example only as being mechanically fastened to one another. Of course, it is contemplated by the present disclosure for bars **48**, **44** and channels **40**, **42**, **46** to be secured to one another in any desired manner.

[0051] It has also be determined that door **10** can easily be converted to fit a wide range of prior art ovens **12** by merely changing the position of U-shaped channels **40**, **42** with respect to one another so as to increase the width of the rectangular opening formed therein.

[0052] In the partially assembled state shown in FIG. **8**, spacer bars **46** provide elongated pane receiving slots (S) that are open at a top end of door **10**, but are closed at the bottom end of the door by bottom bar **48**. In this manner, glass panes **22-2**, **22-3**, and **22-4** can be slid into slots (S) until the glass pane contacts bottom bar **48** as shown in FIG. **9**. Once glass panes **22-2**, **22-3**, and **22-4** have been positioned in slots (S), shroud **32** is secured over the open top end of the slots as shown in FIGS. **2-3**.

[0053] Thus, glass pane **22-1** is the pane that is furthest from interior **16** of oven **12** so as to have the lowest heat exposure. Here, glass pane **22-1** is secured to side rails **28**, **30** using adhesive tape **52**. However, glass panes **22-2**, **22-3**, and **22-4**, which are exposed to higher heat from oven **12**, are loosely held in slots (S) to allow for thermal expansion without the need for costly spacers or seals of the prior art. Moreover, the area between the glass panes **22-1**, **22-2**, **22-3**, and **22-4** is open to ambient air allowing for heat dissipation between the panes.

[0054] In some embodiments, door **10** can include a high temperature seal **54** for sealing the door to oven **12** as shown in FIG. **12**.

[0055] FIGS. **14** through **17** illustrate a comparison of the temperatures on the inside and outside of a prior art oven door as compared to those of oven door **10** according to the present disclosure during a self-cleaning cycle.

[0056] The graphs of FIGS. **14** through **17** plot the temperature in a plurality of locations in degrees Fahrenheit versus time in minutes.

[0057] FIGS. **14** and **15** illustrate the temperatures on the inside and outside of a prior art oven door during a typical a self-cleaning cycle, respectively, while FIGS. **16** and **17** illustrate the temperatures inside and outside of oven door **10** during the typical self-cleaning cycle, respectively.

[0058] The temperature testing was performed using the self-cleaning cycle of a known prior art oven, namely a Monogram Wall Oven Model No. ZET 1SM1S, which is commercially available from the General Electric Company.

[0059] The temperatures on the inside of the prior art door (FIG. **14**) and of door **10** (FIG. **16**) were measured in seven locations, namely the top left inside (TLI) corner of the door, the top right inside (TRI) corner of the door, the center inside (CI) of the door, the inside temperature of the oven (OI), the bottom left inside (BLI) corner of the door, the bottom right inside (BRI) corner of the door, and the top center inside (TCI) of the door.

[0060] Similarly, the temperatures on the outside of the prior art door (FIG. **15**) and of door **10** (FIG. **17**) were measured in seven locations, namely the top left outside (TLO) corner of the door, the top center outside (TCO) of the door, the top right outside (TRO) corner of the door, the outside center (CO) of the door, the bottom left outside (BLO) corner of the door, the bottom right outside (BRO) corner of the door, and the room temperature (RO).

[0061] When comparing the graphs of FIGS. **14** and **16**, it can be seen that the inside temperature measurements during the self-cleaning cycle of a GE Monogram Wall Oven with a prior art door and during the self-cleaning cycle of the same GE Monogram Wall Oven with oven door **10** according to the present disclosure, show similar results. More specifically, it is seen in both graphs, the temperature measurements range between approximately 600 and 800 degrees Fahrenheit.

[0062] Moveover, when comparing the graphs of FIGS. **15** and **17**, it can be seen that the outside temperature measurements during the self-cleaning cycle of a GE Monogram Wall Oven with a prior art door and during the self-cleaning cycle of the same GE Monogram Wall Oven with oven door **10** according to the present disclosure, also show similar results. For example, in both ovens, the maximum recorded exterior temperature is less than 115 degrees Celsius during the self-cleaning cycle. Thus, the simple construction of door **10** ensures that the first or outside glass pane **22-1** is insulated from the heat within oven **12** to a comparable amount as the prior art oven door, but does so without the need for the expensive low expanding glasses and complex designs of the prior art. Thus, door **10** is configured to withstand the temperatures experienced during typical self-cleaning cycles in a simple and cost effective manner, while providing a full-view of the interior of the oven.

[0063] Further, it has been determined by the present disclosure that prior art oven **12** can be retrofitted to include oven door **10** according to the present disclosure by simply removing the prior art door by lifting off the hinges attaching hinges **20** to the oven **12**. This is in contrast to the oven doors of the prior art in which the sealing must be removed from the oven door to the oven peripheral wall via a custom adaptor.

[0064] Referring now to FIG. **18**, an additional preferred embodiment of door **10** according to the present disclosure is shown. In this embodiment, door **10** includes all of the parts shown and discussed above in regards to the alternate embodiments of the door **10** as shown in FIGS. **2** through **13**. However, in this embodiment, door **2** only has two glass panes **22**, namely inner glass pane **222-1** and outer glass pane **222-4**. One glass pane **22** is a tempered pane of low-e, such as PPG's Sungate 500, and the second glass pane **22** is a high performance glass pane having a silver based coating. In one embodiment, inner glass pane **222-1** is a tempered pane of low-e, and outer glass pane **222-4** is a high performance glass pane having a silver based coating.

[0065] It is believed that the glass structure of oven door **10** of FIG. **18**, provides a better transparency than the glass structures of the prior art, while retaining the same temperature resistance during a self-cleaning cycle of an oven. For example, the glass structure of oven doors of the prior art provide a light transmission or transparency of approximately 60% to 70%. However, it is believed the glass structure of door **10** provides a light transmission or transparency of 78%

to 85%, while not exceeding a temperature of 115 degree Celsius during an oven's self-cleaning cycle.

[0066] Referring now to FIG. **19**, a method **100** according to the present disclosure of assembling oven door **10** is shown.

[0067] First, in a positioning step **102**, outer glass pane **22-1** is positioned on a work surface. In a first adhesive preparation step **104**, adhesive tape **52** is prepared for use by removing backing from one side of the tape to expose the adhesive. The exposed sides of the two strips of adhesive tape **52** are then placed on two appropriate and parallel edges of outer glass pane **22-1** in a tape application step **106**.

[0068] In some embodiments, tape application step **106** can include a rolling step **108**, wherein a roller can be used to apply pressure seating the tape to outer glass pane **22-1**.

[0069] In further embodiments, a tape inspection step **110** can be included wherein outer glass pane **22-1** can be inspected to ensure proper positioning, alignment, and appearance of tape **52**.

[0070] Once tape **52** is properly positioned on outer glass pane **22-1**, method **100** further includes a second adhesive preparation step **112**. During second adhesive preparation step **112**, adhesive tape **52** is further prepared for use by removing the backing from the second side of the tape to expose the adhesive.

[0071] Method **100** includes a side rail application step **114** in which side rails **28**, **30** are secured to opposing sides of outer glass pane **22-1**. In a preferred embodiment, side rail application step **114** includes securing inner U-shaped channel **40** to tape **52**. Once inner U-shaped channel **40** is secured to tape **52**, outer U-shaped channel **42** having spacer bars **44**, L-shaped channel **46**, and bottom bar **48** positioned thereon can be secured to inner U-shaped channel **40** using desired connector such as, but not limited to, one or more machine screws (not shown).

[0072] When securing outer U-shaped channel **42** to inner U-shaped channel **40**, slots **50** in the outer U-shaped channel **42** are aligned to a bottom edge of the outer glass pane **22-1**. Then, hinges **18** are positioned within side rails **28**, **30** so that the hinges extend through the slots **50**.

[0073] After side rails **28**, **30** are secured to outer pane **22-1**, glass panes **22-2**, **22-3**, and **22-4** are positioned within slots (S) in first and second glass insertion steps **116** and **118**.

[0074] During first glass insertion step **116**, second and third glass panes **22-2** and **22-3** are positioned in door **10** such that the coating faces the interior **16** of oven **12**. During second glass insertion step **118**, inside glass pane **22-4** is positioned in door **10** such that one coating faces both the interior **16** of oven **12**, while the other coating faces the exterior of the oven.

[0075] After completing glass insertion steps **116**, **118**, method **100** includes a shroud fastening step **120** in which shroud **32** is positioned and secured to door **10** so that lock opening **24** is on the upper side of the door and on the same side inside glass pane **22-4** and slots **50**.

[0076] In embodiments of door **10** having handle **26**, method **100** includes additional positioning, adhesive preparation and inspection steps for securing the handle to outer glass pane **22-1**.

[0077] Referring now to FIG. **20**, method **100** can include a second positioning step **122**, where the inner glass pane **22-4** is positioned on a work surface, a first adhesive preparation step **124**, where adhesive tape **52** is prepared for use by removing backing from one side of the tape to expose the adhesive and the exposed side of the adhesive tape is placed on a side of outer glass pane **22-1** opposite side rails **28**, **30** in a tape application step **126**.

[0078] In some embodiments, tape application step **126** can include a rolling step **128**, wherein a roller can be used to securely and evenly bond the exposed side of the adhesive tape to outer glass pane **22-1**.

[0079] In further embodiments, a tape inspection step **130** can be included wherein outer glass pane **22-1** can be inspected to ensure proper positioning, alignment, and appearance of tape **52**.

[0080] Once tape **52** is properly positioned on outer glass pane **22-1**, method **100** further includes a second adhesive preparation step **132**. During second adhesive preparation step **132**, adhesive tape **52** is further prepared for use by removing the backing from the second side of the tape to expose the adhesive.

[0081] Once exposed, method **100** includes a handle application step **134** in which handle **26** is secured to outer glass pane **22-1**.

[0082] While the present disclosure has been described with reference to one or more exemplary embodiments, it will be understood by those skilled in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the present disclosure. In addition, many modifications may be made to adapt a particular situation or material to the teachings of the disclosure without departing from the scope thereof. Therefore, it is intended that the present disclosure not be limited to the particular embodiment(s) disclosed as the best mode contemplated, but that the disclosure will include all embodiments falling within the scope of the appended claims.

What is claimed is:

1. An oven door comprising:

one or more glass panes;

a frame including a shroud and a pair of side rails for holding in place the one or more glass panes;

a pair of hinges for securing the frame to an oven; and

a mechanism for holding the oven door in a closed position relative to the oven, wherein the one or more glass panes provide a full view of the interior contents of the oven when the oven door is in the closed position.

2. The oven door of claim **1**, wherein the one or more glass panes comprises a plurality of glass panes, and the oven door further comprises a plurality of spacer bars for receiving and spacing the plurality of glass panes.

3. The oven door of claim **1**, wherein the shroud is configured to engage an oven electronic device.

4. The oven door of claim **3**, wherein the oven electronic device is a light switch.

5. The oven door of claim **1**, wherein the shroud comprises at least one or more vent openings, the at least one or more vent openings providing fluid communication between ambient room air and spaces between the at least one or more glass panes.

6. The oven door of claim **2**, wherein the glass pane comprises:

an outer glass pane;

an inner glass pane;

a third glass pane adjacent an interior of the oven; and

a fourth glass pane, wherein the third and fourth glass panes are positionable between said outer and inner glass panes.

7. The oven door of claim **6**, wherein the inner glass pane is a low-emissive glass pane.

8. The oven door of claim **6**, wherein the outer glass pane is a non-reflective decorative glass pane.

9. The oven door of claim **6**, wherein the third and fourth glass panes are low-emissive glass panes.

10. The oven door of claim **6**, wherein said inner glass pane has a first inner surface that is substantially planar to a second inner surface of said frame.

11. The oven door of claim **1**, wherein said pair of hinges are spring arm hinges or cam-arm hinges.

12. The oven door of claim **6**, wherein each one of said pair of side rails comprises:

an inner u-shaped channel;

an outer u-shaped channel including a slot positioned and configured to receive a first one of said pair of hinges;

an L-shaped channel; and

a bottom bar.

13. The oven door of claim **12**, further comprising an adhesive tape for connecting the inner U-shaped channel, and the at least one of said plurality of spacer bars to the outer glass pane.

14. The oven door of claim **13**, wherein the adhesive tape connects the handle to the outer glass pane.

15. The oven door of claim **13**, wherein the adhesive tape is a double coated acrylic foam tape.

16. The oven door of claim **1**, further comprising a high temperature seal for sealing the oven door to the oven.

17. A door for an oven, comprising:

an outer glass pane adjacent an exterior of the oven;

an inner glass pane adjacent an interior of the oven;

a high temperature seal on the inner glass pane for sealing the oven door to the oven;

a third glass pane;

a fourth glass pane, the third glass pane being between the inner glass pane and the fourth glass pane, the fourth glass pane being between the outer glass pane and the third glass pane;

a frame including a shroud and a pair of side rails for holding the outer, inner, third, and fourth glass panes;

a plurality of spacer bars providing a space between the inner glass pane and the third glass pane, between the third and fourth glass panes, and between the fourth glass pane and the outer glass pane; and

one more vent openings defined in the shroud to provide fluid communication between ambient room air and the spaces.

18. The oven door as in claim **17**, wherein the inner glass pane, the third glass pane, and the fourth glass pane each comprising low-emissive glass, and the outer glass pane comprising non-reflective decorative glass.

19. The oven door as in claim **17**, wherein said inner glass pane and said exterior glass pane have a light transmission of approximately 78% to 85%.

20. The oven door of claim **17**, wherein the spaces and one or more vents are sufficient to ensure that a temperature of the exterior glass pane does not exceed 115 degrees Celsius during a self-cleaning cycle of the oven.

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