THE JOINT EXAMINATION BOARD

PAPER P4

Amendment of Specifications for United Kingdom Patents/Applications in Prosecution, Revocation Proceedings or Otherwise

Wednesday 7th November 2012

10.00 a.m. – 1.00 p.m.

Please read the following instructions carefully. ***Time Allowed – THREE HOURS***

1. Please note the following:

    a. Start each question (but not necessarily each part of each question) on a fresh sheet of paper;
    b. Enter the Paper Number (P4), the question number and your Examination number in the appropriate boxes at the top of each sheet of paper;
    c. The scripts are photocopied for marking purposes. Please write with a **dark inked pen** on one side of the paper only and within the printed margins, and do not use highlighters in your answer;
    d. Do not state your name anywhere in the answers;
    e. Write clearly, examiners cannot award marks to scripts that cannot be read;
    f. Reasoning should always be given where appropriate.
    g. You must number all the pages of your answer script. Once the exam finishes, an additional 5 minutes will be allowed for you to do this.

2. Under the Examination Regulations **you may be disqualified from the examination and have other disciplinary measures taken against you if**:

    a. you are found with unauthorised printed matter or other unauthorised material in the examination room;
    b. your mobile phone is found to be switched on;
    c. you copy the work of another candidate, use an electronic aid, or communicate with another candidate or with anyone outside the examination;
    d. you continue to write after being told to stop writing by the invigilator(s). **NO WRITING OF ANY KIND IS PERMITTED AFTER THE TIME ALLOTTED TO THIS PAPER HAS EXPIRED.**

3. **At the end of the examination assemble your answer sheets in question number order, number all the pages and put them in the WHITE envelope provided**. Do not staple or join your answer sheets together in any way. Any answer script taken out of the examination room will not be marked.

This paper consists of 20 sheets including this sheet, and comprises:
Question [1 sheet]
Client's letter [1 sheet]
Client's Application GB 0909090.9 [9 sheets]
Official Letter [1 sheet]
Prior art reference GB 1,111,111 [4 sheets]
Prior art reference Pizza World Monthly [3 sheets]

Question

A United Kingdom patent application comprising the attached specification (identified as GB 0909090.9) has been filed at the UK Intellectual Property Office without any claim to priority.

The UK Intellectual Property Office has now issued the attached Official Letter. You have received brief comments from your client in a letter, which is also attached.

Your task is to prepare:

1. A letter to the UK Intellectual Property Office in response to the Official Letter;
2. A set of amended claims, if considered necessary;
3. An outline memorandum for your client, explaining the actions you have taken and why. You should provide full reasoning for your actions and provide an outline of future actions that your client could take to secure full protection for their commercial interests as outlined by your client, taking into account that further information may be needed. This future advice should only relate to the invention(s) outlined in the client's letter to you. These notes should also be restricted to patent matters and you are NOT required to consider other matters such as copyright or design protection.

If the advice to your client includes a suggestion of filing a divisional application or applications you should draft the corresponding independent claim(s) and your memorandum should explain why filing a divisional is advisable. You should NOT draft a description or any dependent claims for a divisional application.

Note the following:

(a) You are NOT required in this examination to make any amendments to the description of the client's patent application.

(b) You should accept the facts given to you and base your answer on those facts. In particular you should NOT make any use of any special knowledge that you may have of the subject-matter concerned, and you must presume that the prior art referred to is exhaustive.

(c) If you submit any amended claim set and/or divisional claims(s) put these at the top of the answer papers when handing in your answer and number the pages accordingly so as to readily identify the claims or claim sets.

Letter from client

Dear Pat:

Thank you for sending this report from the examiner. I'm sorry I'm a bit late in getting back to you despite all your reminders. I hope you obtained an extension of time for replying to the examiner as this product is proving to be quite successful. As you know, our system is very marketable because it's quite compact. The old conveyor belt ovens take up one whole side of a kitchen, whereas ours can be stuck in a corner, because pizzas are put in and taken out in the same place. This had seemed to be a unique feature of our product, but it seems it may no longer be so.

Turning to the report, the GB patent does look a bit similar to our oven, but it's much less useful. It's more of a fiddle to use, always having to open and close the door to put pizzas in and to take them out, and it must be expensive to run because lots of hot air escapes whenever the oven door is opened (with our system the turntable arrangement automatically keeps the heat in). The business with the holding oven is a bit silly, too, because if you need a higher throughput, you might as well just stack two identical ovens in the same space and get proper fresh pizzas; capital costs are small compared to running costs in this business.

The magazine article is one of those old conveyor belt systems I mentioned. It's got a similar problem to the oven from the GB patent, in that you're constantly replacing hot air that escapes from the oven. I see this one has an automatic door at the start of the belt that closes up the baking chamber, but really it's just a gimmick because it takes each pizza over a minute to clear the opening (the belt creeps forward at a continuous slow pace) and the fans in the oven are blowing full power in the meantime. I also doubt the exit door would work very well, because a photodetector within the oven would fail often. I mention all this because our customers tell us that low running costs are very important, and we're therefore now focusing on the efficiency of our oven in our marketing material.

I should mention that our oven uses a standard 'off-the-shelf' intermittent drive motor system, which is the same motor unit and controller that we used in our old automated food carousel. To adapt the motor system to our new oven, all we had to do was input how far the turntable rotates after each activation.

Also, we've been experimenting with other types of food in our oven (such as savoury and sweet pies, welsh rarebit, etc), with great success. Off the back of this, we've received enquiries from outside the pizza sector from people who say they've never seen anything like our oven before. When you've finished getting this patent for us, perhaps we can discuss getting protection for using the oven with pies, etc.

In other news, the hot air jet system turned out to be very effective in trials, though it is expensive and only works with certain kinds of pizza. We therefore think there may be a good market for it as an optional extra for our pizza ovens.

Regards,

P. Peroni

GB 0909090.9

PIZZA OVEN

The present invention relates to ovens, and in particular ovens for producing pizzas.

A wide variety of commercial ovens have been designed for various purposes, but the Applicant is unaware of any ovens which are satisfactory for the high volume production of pizzas. It is known to enclose a conveyor belt within an oven cavity, and to provide heaters at the top of the cavity, such that a pizza placed at one end of the belt is cooked by the heaters as it progresses along the belt, emerging cooked at the other end. This is cumbersome because the cooked pizza is delivered far away from the point where the uncooked pizza is inserted into the oven. There is also considerable heat loss from the open apertures at either end of the conveyor belt, making the oven relatively expensive to run.

The Applicant has developed an oven for baking foodstuffs, with particular applicability to the high-volume, uniform production of pizzas in a pizza restaurant.

In the preferred form of oven of this invention, the oven has a baking chamber, a fan and heaters so arranged as to provide a forced draft of heated and reheated air along a closed path through the chamber. A platform is mounted for rotary movement intermittently with a portion of the platform located outside the baking chamber where it may be loaded and unloaded by the chef. The platform is preferably divided into a plurality of equal arcuate segments with dividing walls in between, such that whenever the platform is rotated through an integral number of segments, the walls cooperate with the oven housing to seal the baking chamber and thus confine the heated air stream. The segments are each big enough to hold at least one pizza, but can preferably fit more, such as at least three pizzas. The oven is preferably provided with automatic controls for advancing the turntable at adjustable predetermined intervals.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an isometric perspective, some portions being diagrammatic, of the oven of the invention;

FIG. 2 is a plan of the oven constructed pursuant to the invention;

FIG. 3 is a cross-section, the plane of which is indicated by the line 3--3 of FIG. 2;

FIG. 4 is an isometric perspective view of the platform with one grid shown in an elevated position;

DETAILED DESCRIPTION

There are many instances in which it is desired to heat foodstuffs such as pizza either from a frozen condition or from room temperature to a suitable temperature for cooking and eating. A suitable oven will now be described.

Resting on legs 4 at about waist height is an enclosure 6 substantially rectangular in plan and with a truncated corner 7. The enclosure has a frame 8 and is divided into an upper chamber 9 and a lower chamber 11 by a substantially planar, partially perforated intermediate sheet 12. The enclosure includes side walls 13 as well as a top wall 14 and a bottom wall 16. These walls typically are made up of an outer sheet 17, an inner sheet 18 and intermediate thermal insulation 19.

Disposed just above the intermediate sheet 12 is a platform 21 secured to a shaft 22 having a vertical axis and mounted in upper and lower bearings (not shown) fixed on the frame 8. The platform has a circular hoop 27 angular in cross-section and joined to a hub 28 on the shaft 22 by a number of radial spokes 29 also angular or inverted T-shape in cross-section. The number of spokes is chosen to divide the platform into any selected number of sectors; in this case there are four sectors, so each sector spans ninety degrees. The platform supports the foodstuffs to be cooked, such as pizza or the like.

Adapted to rest detachably in the individual sectors are basket-like grids 31 (FIG. 4) each having an angle rim 32 and angle arms 33 and 34 as well as a perforated or openwork support 36. The grids can rest on the hoop 27 and spokes 29 either in an upright position, as seen in FIG. 4, or in an inverted position (not shown), allowing the proximity of foodstuffs to the heater element to be altered without requiring any adjustments inside the oven.

The platform 21 is only partially enclosed in the upper chamber 9. The truncated corner is defined by radial side walls 41 and 42. These will align vertically with the radial boundaries of a sector of the platform. The radial walls 41 and 42 are continuous with their adjacent side walls 13 and similarly merge with the top wall 14. The radial side walls 41 and 42 do not extend downwardly to the grids 31, but rather terminate a substantial distance above the platform 21 to define openings 43 and 44 just sufficient to pass or clear the upstanding walls 45 of the T-shaped spokes 29. For as long as the spokes 29 remain in position below the walls 41, 42, the amount of air escaping from (or entering) the oven is negligible, and the interior oven space is effectively sealed.

Means are provided for rotating the platform 21, preferably in an intermittent fashion, so that successive sectors defined by the radial walls 45 are in turn left exposed and then advanced into and through the closed upper chamber 9. For example, a platform drive motor (not shown) may be mounted on the frame 8 and connected to the shaft 22.

Initially the platform 21 is positioned such that both of the openings 43 and 44 are virtually blocked at the same time by two of the spokes 29. This blocking segregates the exposed quadrant of the platform 21 from the three remaining quadrants within the upper chamber 9. After a selected period for rest, a timer energizes the motor and the platform 21 is advanced through a quarter turn.

To provide heating, radiant heater elements 57 and 58 are fastened to the top wall 14 and within the enclosed three-quadrants of the housing 6. Also, a gas heater (not shown) is installed in the lower chamber 11 to afford a supply of warm air circulated by a fan 61 driven by an electric motor 62. The air passes through the upper chamber 9 and back through an opening (not shown) in the intermediate sheet 12 to the lower chamber 11 and heater (not shown) in a closed path. Preferably the fan 61 is disengaged while the platform 21 is being moved, to reduce the amount of hot air escaping while the oven cavity is not fully sealed.

A diverter 65 (FIG. 3) directs warm air to flow toward the corner heating space. In an alternative embodiment, a second diverter (not shown) directs a portion of the warm air into a conduit arranged above and in close proximity to the platform 21. The conduit includes a plurality of nozzles for directing jets of hot air down onto a pizza. Preferably the nozzles are shaped so that the jets of heated air have a velocity at the point of contact with the pizza sufficient to cause temporary displacement within the toppings portion. This generally causes pizzas to cook faster because (for one reason) the toppings may be pushed away to expose the layer of sauce. Since the sauce has better thermal conduction properties than the cheese, direct contact with the sauce leads to faster thermal transfer to the crust. For best effect, it is preferred that the jets of heated air exiting the nozzles have an average velocity of at least 32 metres per second (m/s).

During normal operation, items for heating or cooking are individually deposited on the grid 31 in the exposed sector or quadrant. The motor is then energized, and the platform 21 is advanced to introduce the deposited items into the heated enclosure and to present in the exposed sector a grid that is empty for loading or contains previously processed items for unloading. Once started, the platform 21 can be left to advance automatically and intermittently one sector at a time with intervening rest periods to heat successive items over the desired period. Preferably the periods during which the platform is at rest are at least five times as long as the periods during which the platform is in motion.

Typically several pizzas may be loaded on one quadrant of the platform. The platform is operated to rotate the platform 90 degrees during a period of five seconds approximately every two minutes. Operated in this way, each individual pizza receives approximately a six-minute baking cycle under the influence of the intense heat of the closed-cycle heated and reheated air stream, and the oven will produce pizzas at a rate of thirty pizzas an hour with three pizzas on each quadrant. Obviously cooking time and product can be varied. The

finishing oven mentioned above is included (above the corner 66) to complete the baking cycle of any particular pizza (or other foodstuff) which requires baking for an extended period of time. Conveniently, the finishing oven has an external door 67 to the chamber through which pizzas can be placed into the oven for short periods of time.

It will be noted that the entire oven has a substantially rectangular vertical cross-section with a flat top and bottom which permits ovens to be stacked.

It will be appreciated that variants are possible with different angular dimensions. For example the oven area could extend 180 degrees and the access area could extend similarly, for a larger preparation area but smaller cooking space. Alternatively the platform could be divided into more than four segments, though clearly the capacity of each segment will be reduced as the total number increases. It was found that the most effective arrangement, however, was to divide the platform into 3 segments for the oven area, and 1 for the access area, as described herein.

CLAIMS

1. A pizza oven comprising: a platform, housing means substantially surrounding the platform to define an oven area, heating means for heating air in the oven area, an access area for transferring a pizza to and from the platform, and drive means for driving the platform in a substantially circular motion around a substantially vertical axis, whereby the pizza, when placed on the platform in the access area, is returned to the access area after passing into the oven area.

2. A pizza oven according to Claim 1, further comprising circulating means for circulating the heated air throughout the oven area.

3. A pizza oven according to Claim 2, wherein the circulating means includes nozzles for directing jets of hot air onto the top of the pizza.

4. A pizza oven according to any preceding claim, further comprising sealing means, cooperating with the housing means, for preventing the escape of hot air from the oven into the access area.

5. A pizza oven according to Claim 4, wherein the sealing means includes at least one vertical wall.

6. A pizza oven according to any preceding claim, wherein the platform is divided into a plurality of arcuate segments, and the drive means is adapted to rotate the platform intermittently through an integral multiple of the arcuate extent of the segments.

7. An oven substantially as herein described with reference to the attached figures.

Fig.1

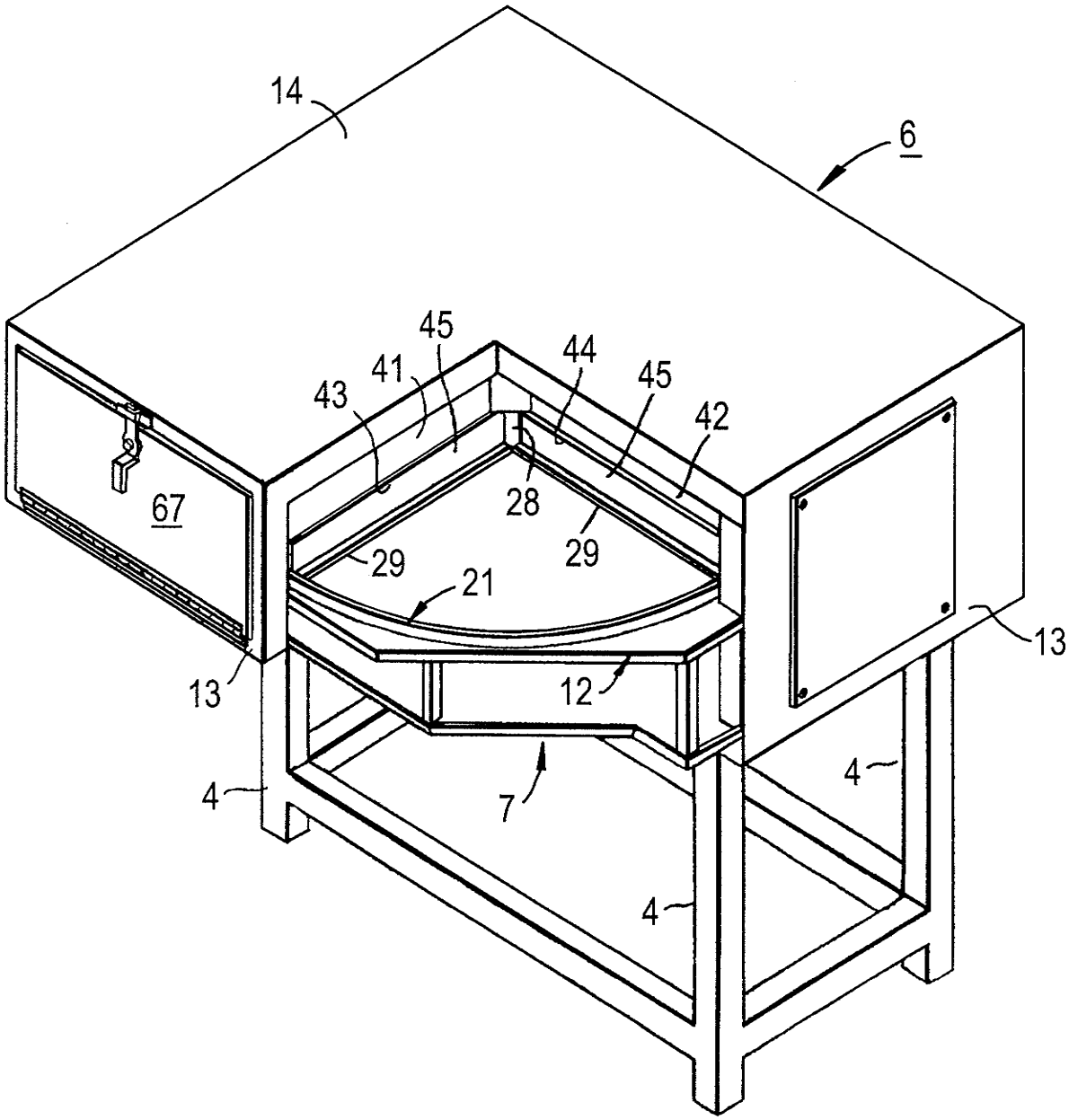
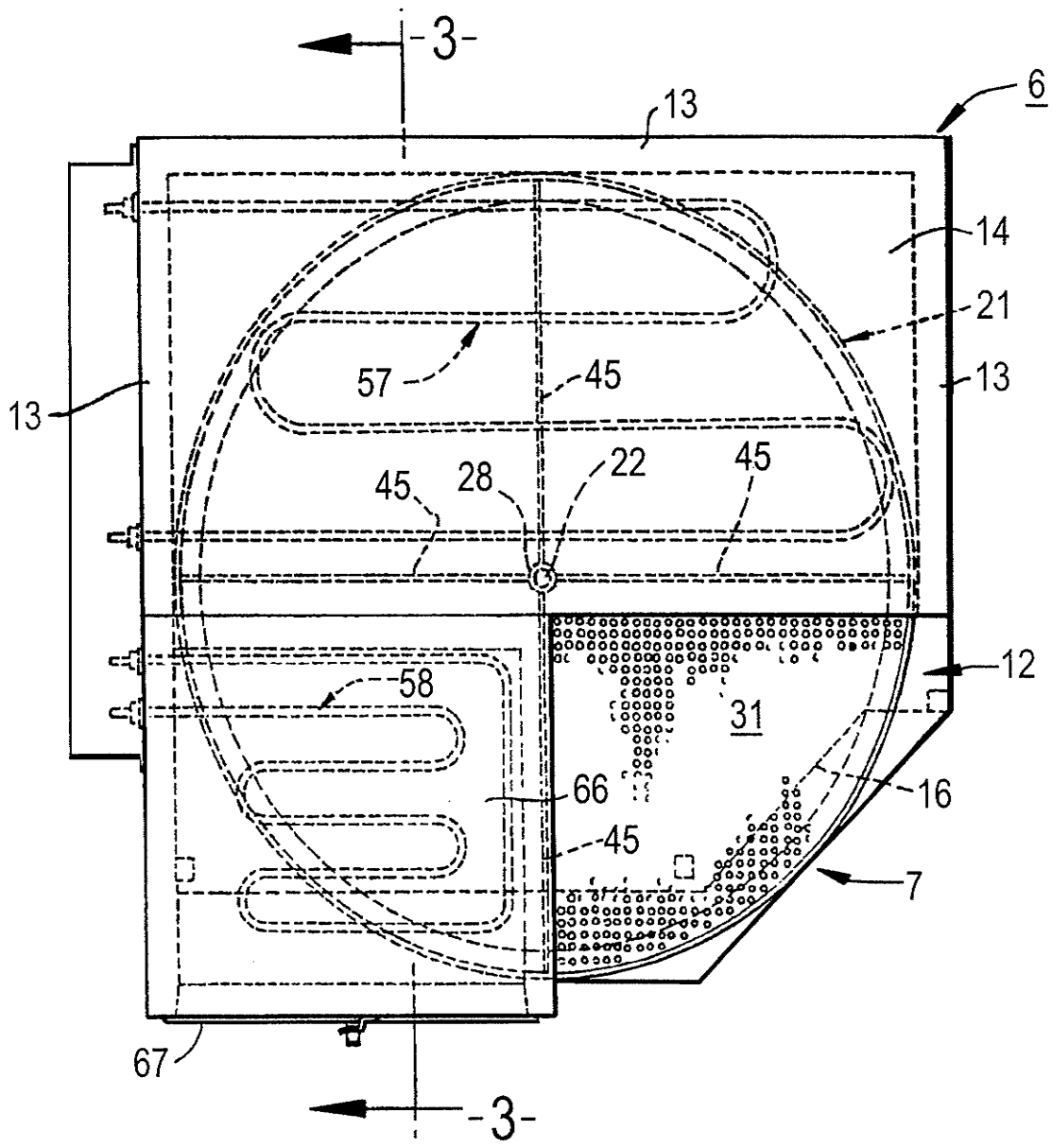


Fig.2



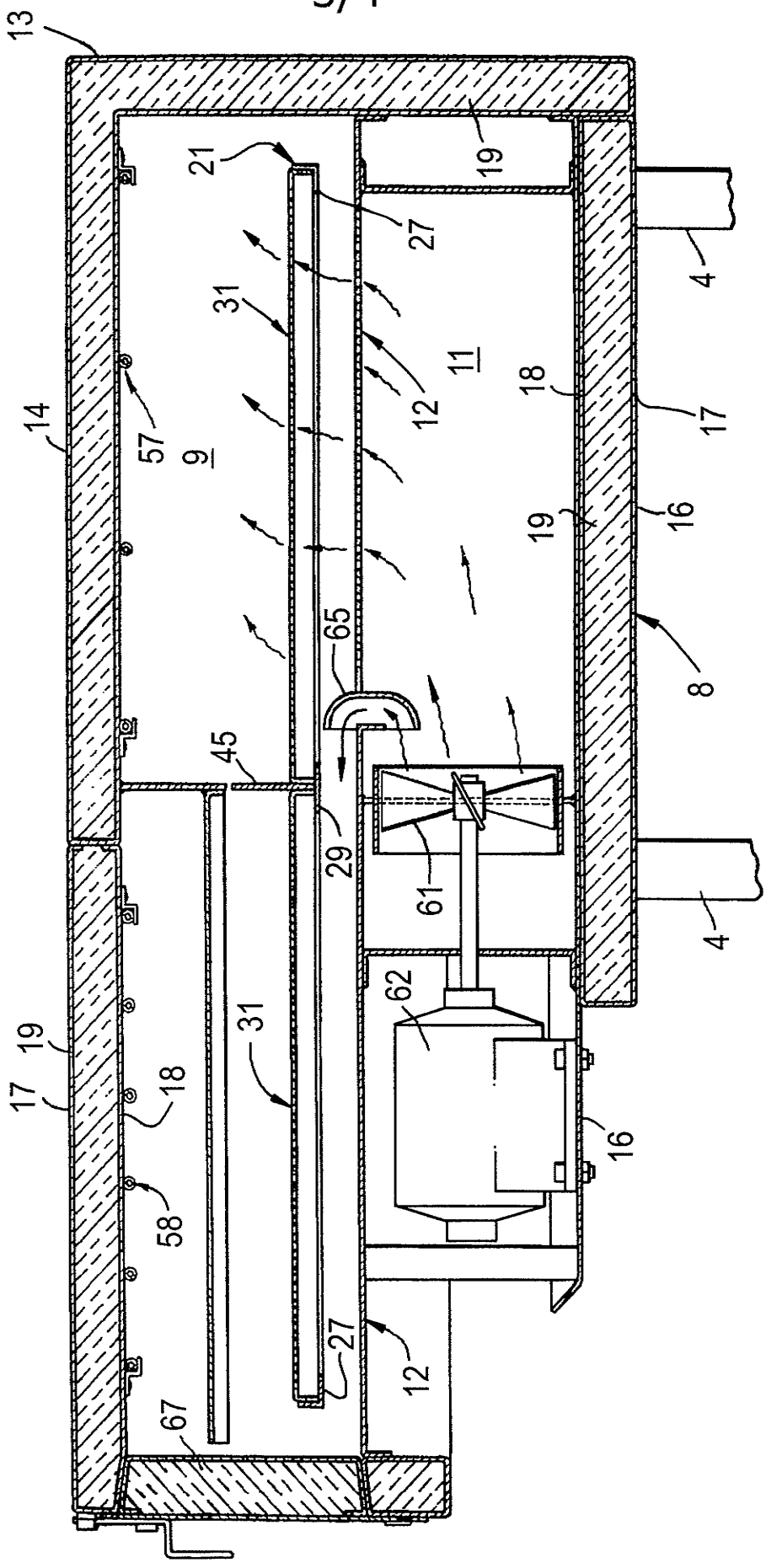

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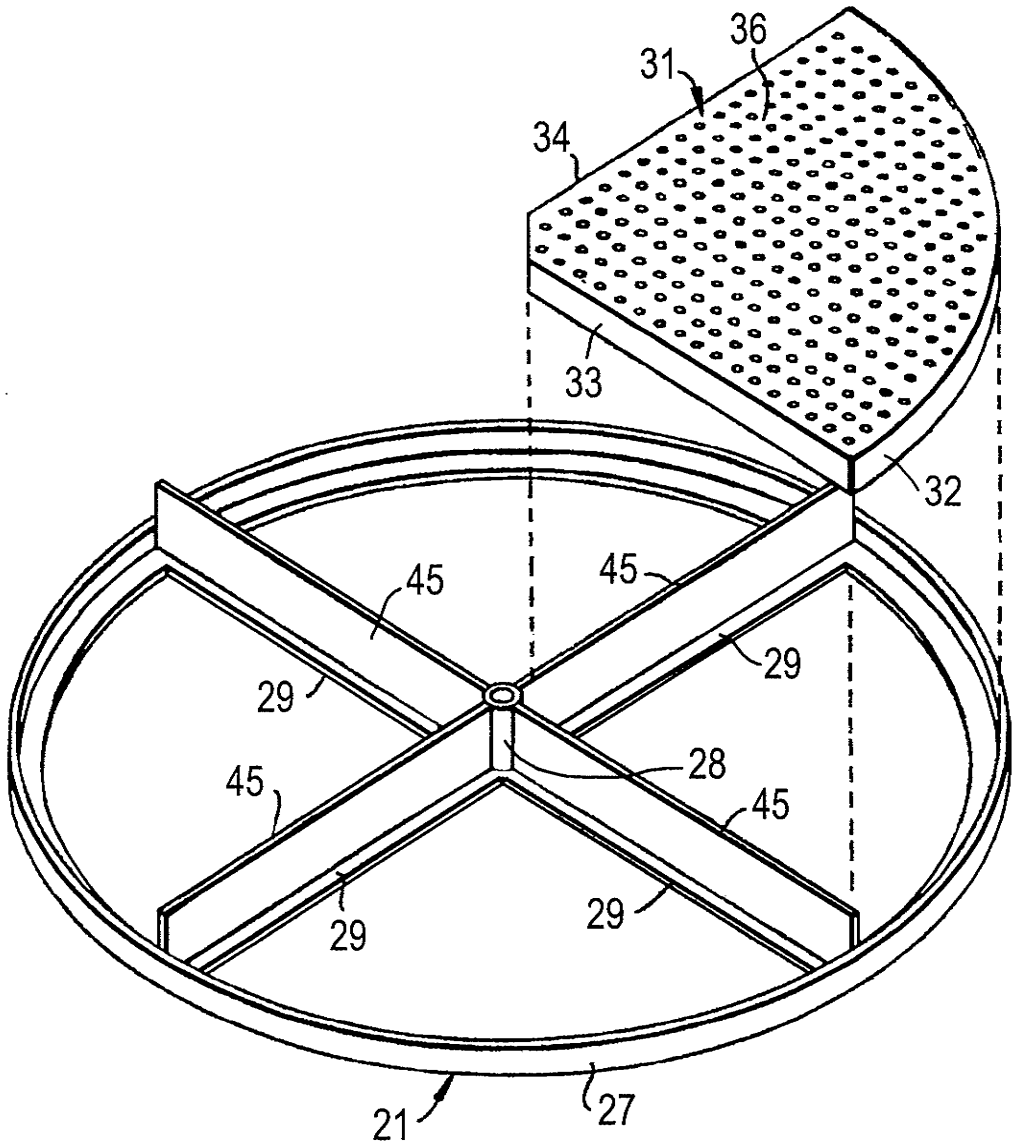
Fig.3

Fig.4



15 June 2012

Application No. 0909090.9

Patents Act 1977: Examination Report under Section 18(3)

Latest Date for Reply: 15 October 2012

Reference is made to GB 1,111,111 (D1) published on 15 July 2008 and the attached extract from Pizza World Monthly (D2) published on 6 June 1997, both documents being published before the filing date of the application under examination (10 December 2009) and therefore usable for the purposes of assessing both novelty and inventive step.

Novelty

Claim 1 is not new because an oven of this type is disclosed in D1. This document discloses a platform (the turntable 14), housing means substantially surrounding the platform (the baking chamber 5), heating means (heating element 23), an access area (main door 9), and drive means for driving the platform in a substantially circular motion around a substantially vertical axis (motor 16).

Claim 2 is not new (the fan 25 of D1) and is in any event a commonplace feature of ovens.

Claim 4 is also not new (doors 7 and 9 of D1) and is in any event a commonplace feature of ovens.

Inventive step

Claim 3 is not inventive because it is a matter of routine or obvious choice in the art. The circulation of air within an oven is a common feature in many different types of oven.

Claim 5 is not inventive because it is known from D2 to use vertical walls (in the form of doors in the entrance and exit apertures 12, 18) in order to seal a baking chamber 47 of a pizza oven.

D1 / GB 1,111,111, published 15 July 2008

Process for baking pies

This invention relates to a baking method, and more particularly to an improved process for baking pies for quick serving in a fast-food restaurant.

The objective of this invention is to provide a unique process for fast baking which consists of step-wise baking to provide pies at peak demand without sacrificing the pie quality. Another objective of this invention is to provide a process for baking which requires a minimum of supervision and skill.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows the front view of the oven; and
FIG. 2 is a cross-sectional view of the oven.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIG. 1, fresh pies are loaded onto a constantly rotating turntable at 9, the main door. The turntable rotates counter-clockwise at a rate of about one revolution per ten minutes. This is enough to completely cook a pie. Normally, the pies travel on the turntable for, for example, four-fifths of a full revolution, in about eight minutes, to precook the pies. At time of peak demand, the pies are left in the baking chamber for the final fifth of the revolution on the turntable, for about two more minutes, and returned to the main door, 9, at which time the pies are fully cooked and removed from the oven to be served. At times when the demand for pies is slow, precooked pies are removed from the baking chamber at 7, the second door, and placed in a holding chamber 6 to be kept warm. As demand picks up again, precooked pies in the holding chamber may be returned to the baking chamber at 7 to travel on the turntable for cooking to completion in approximately two minutes. The fully cooked pies are removed from the baking chamber 5 at the main door 9. A latch is provided (not shown) so that the door 9 can be latched open during peak times to allow the uninterrupted loading and unloading of pies to and from the turntable via the open aperture of the door 9.

In more detail, referring to both FIGS. 1 and 2, the turntable oven comprises a lower baking chamber 5 having a housing defined by a lower cylindrical wall 4, and a bottom 3; and an upper holding chamber 6 having a housing defined by an upper cylindrical wall 1 and a flat roof 2. The two chambers are separated by a horizontal top wall 11 which defines a roof for the baking chamber. The top wall 11 has a central opening 18 which provides fluid communication between the two chambers.

In the baking chamber, there is provided a horizontal circular turntable 14, supported by radial arms 17, rigidly fixed to the upper end of a vertical rotatable shaft 15 in such a way that the turntable baking surface is unobstructed. The turntable 14 is driven by an electric variable-speed motor with a gear speed reducer and chain drive generally indicated as 16.

In the holding chamber 6 there is provided a holding table 10 of approximately the same diameter as the turntable 14. It is rigidly fixed at the centre of the upper side of the table to the lower end of a second rotatable shaft 12. The second shaft 12 is driven by a similar drive assembly 13 as the one used for driving the shaft 15 in the baking chamber. This assembly 13 is preferably located above the roof 2. The holding table 10 is operated by an electric switch 27 located on an instrument and control panel 50 which is fixed on the outside of the cylindrical walls 1 and 4. The holding table can be rotated in either direction so that any part of the table can be moved opposite a door 8.

In a secondary embodiment (not shown), a portion of the oven housing in the vicinity of the main door 9 is detachably removable, leaving part of the turntable exposed outside the oven area in order to facilitate rapid loading and unloading of pies. In this case greater convenience can be provided at the expense of operational efficiency.

With reference to Fig. 1, the second door 7 is located at such a position that the longer distance between the doors 7 and 9 travelled by the turntable provides sufficient time for precooking fresh pies, and the remaining shorter distance between the doors 7 and 9 travelled by the turntable provides sufficient time for final baking of the precooked pies. The door 8 to the holding chamber is directly above the second door 7 for convenient transfer of pies between the two chambers.

Chamber 5 is heated by hot air supplied from an external source or by gas burners under the turntable, as is well known in the art. Some of the hot air bleeds though opening 18 and is circulated in chamber 6 by fan 25. In the final baking section, a thermostat 21 is present for controlling the temperature of an electric coil 23 suspended above the turntable behind the panel. The heating element 23 provides intense cooking of precooked pies to completion at a temperature higher than the prebaking, and generally around 600 °F. The heating element may be affixed to the lower cylindrical wall 4 and supported from the top wall 11, extending horizontally from the wall to the centre of and above the turntable. Partially cooked pies passing under the heating elements are cooked to completion in about two minutes or less while travelling from the second door 7 to the main door 9. Thus the pies baked under the intense heat will be golden brown with minimum loss of moisture.

1/2

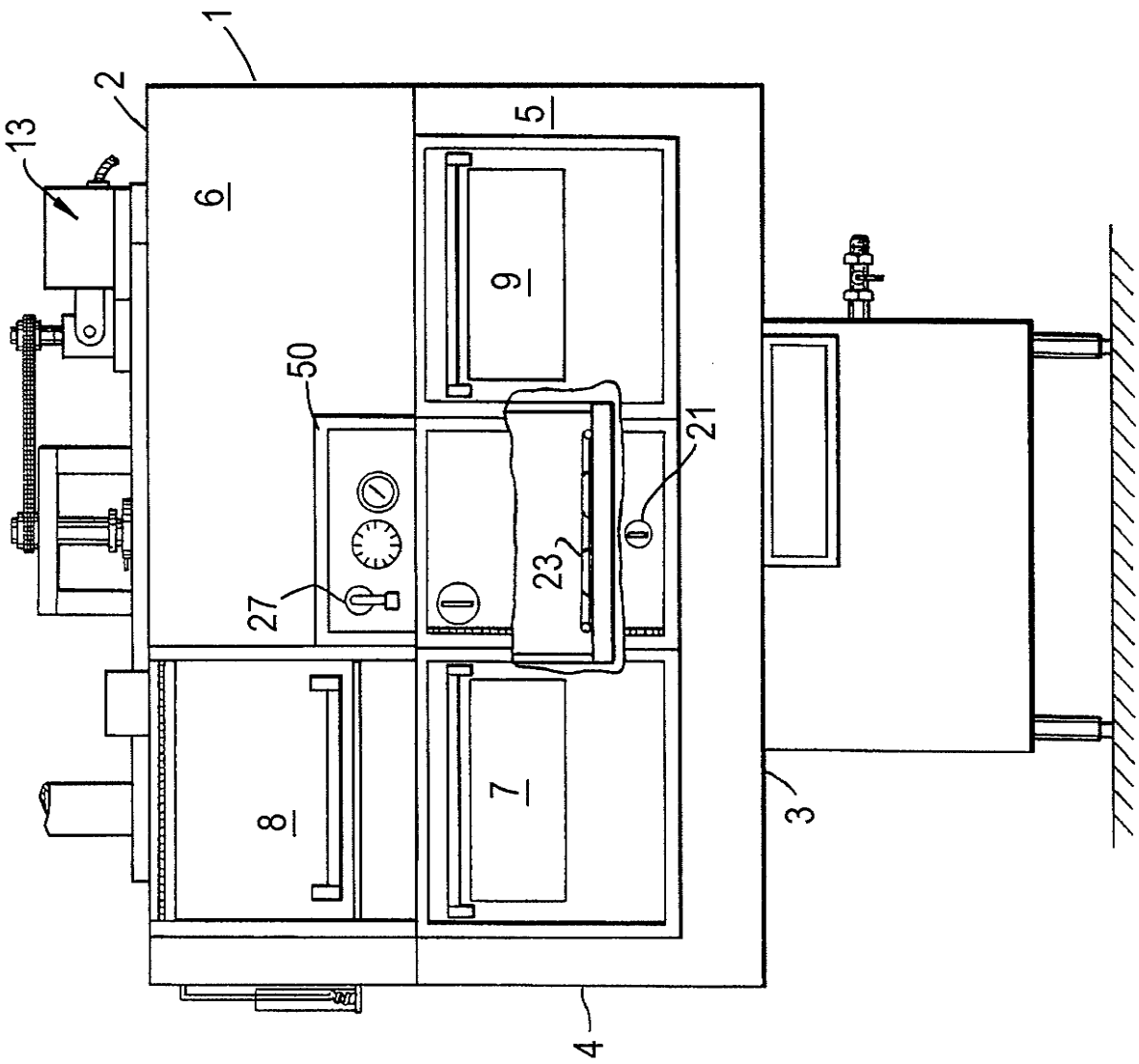


Fig.1

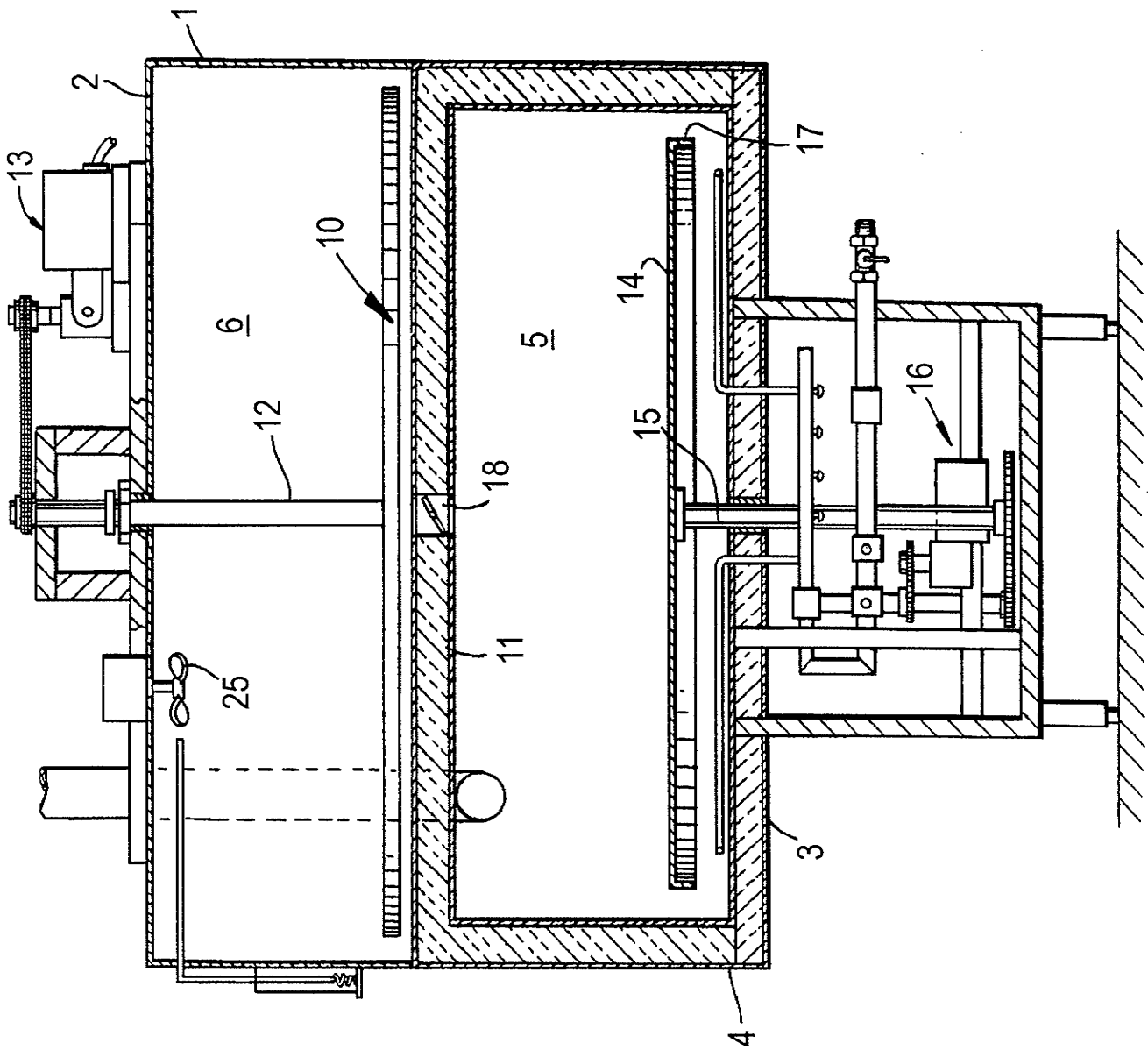


Fig.2

D2 / Pizza World Monthly - published 6 June 1997

NEW PIZZA OVEN

We can now share with you some details of the latest Pizza oven conveyor belt oven model.

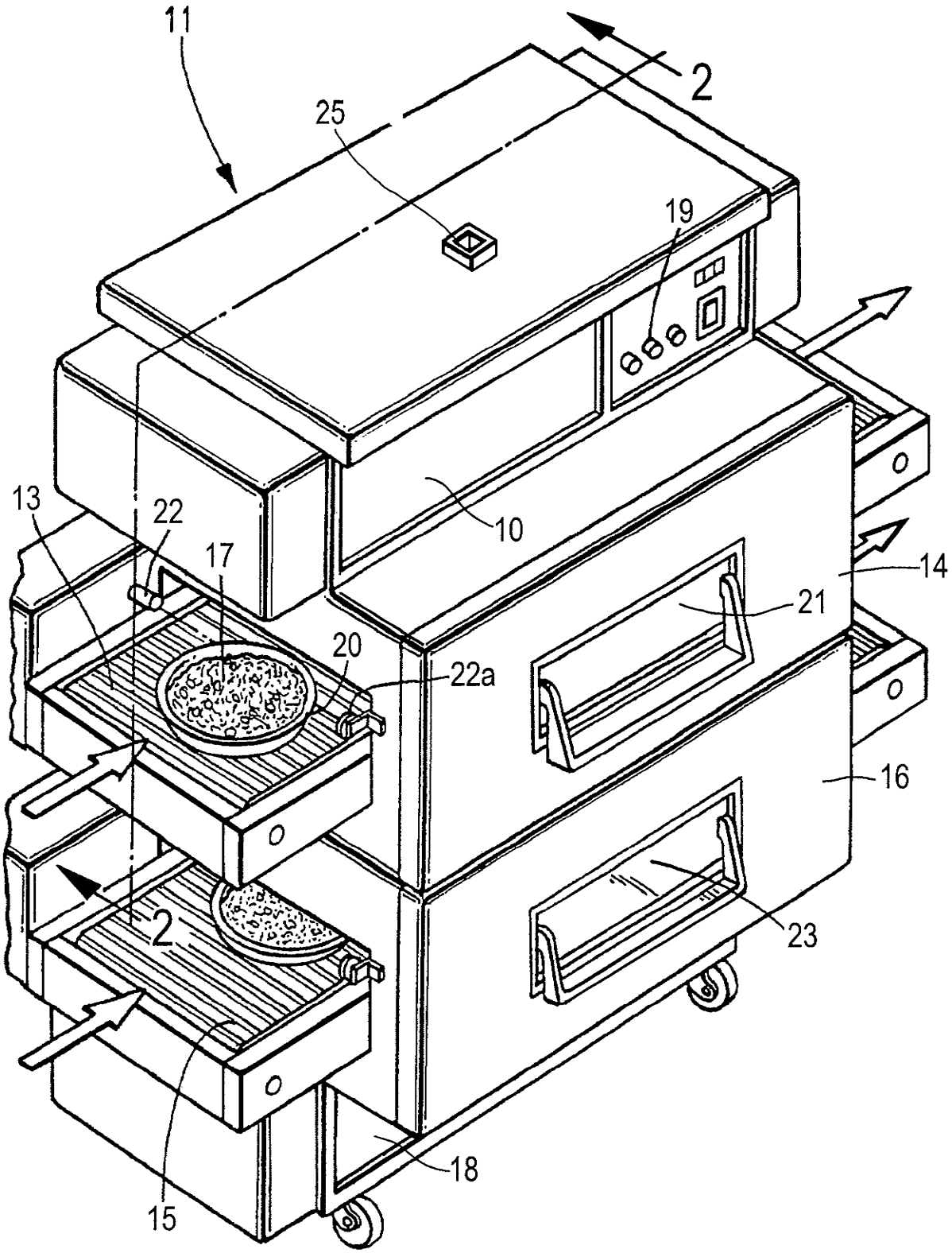
As shown in FIGURE 1, this oven system 11 is actually a double oven including a top conveyor 13 which moves a pizza 17 in a pan 20 through the upper oven 14 as well as a bottom conveyor 15 which moves a pizza through the bottom oven 16. The top mechanical cabinet 10 houses the burner, fans, and motors for the top oven 14 while the bottom mechanical cabinet 18 houses the burners, fans, and motors for the bottom oven 16. Observation windows 21 and 23 allow inspection of the inside of the ovens. On the front of the oven near the top is a set of typical controls and indicators 19 and a cooling air exhaust 25 is included on top of the mechanical cabinet 10.

Referring now to FIGURE 2, which is a vertical cross-section of the upper oven of the oven system 11, it is seen that the conveyor moves the pizza 17 through the entrance 12, through the baking chamber 47 and out the exit 18.

Air is drawn from the baking chamber 47 into the return air duct 27 by the blower wheels 37 and 39. Before entering the return air duct, the air is heated by a gas burner (not shown). Air is returned to the baking chamber 47 via two arrays 54, 56 of air vents that are arranged above and below the conveyor belt 13 respectively, so as to deliver a uniform, smooth flow of hot air around the pizzas. The fans 37 and 39 are driven by electric motors 41 and 43 respectively. The length of the baking chamber 47 (indicated on FIG. 2 as line *lbc*) is approximately six feet and the speed of the conveyor belt is typically around 1 foot per minute.

The photodetector 22 senses when a pizza is moving into the oven and thereupon sends a signal to a controller (not shown) which increases the power transmitted to the fans in the oven for the appropriate cooking time (typically between four and eight minutes, depending on the belt speed). At the end of this time period, the fans return to the normal idling level unless another pizza is introduced into the oven, in which case the time period restarts. The signal from the photodetector 22 also causes the motor 52 to raise the door 50 in the entrance aperture 12 from a closed state (shown in FIGURE 2) to an open state (shown in FIGURE 1) for as long as necessary to allow the pizza to pass into the oven. In future models, it is intended to provide a similar door system at the exit aperture 18 in conjunction with an appropriately placed heat-resistant photodetector at the far end of the baking chamber 47. The door 50 reduces the amount of hot air lost from the oven.

Fig.1



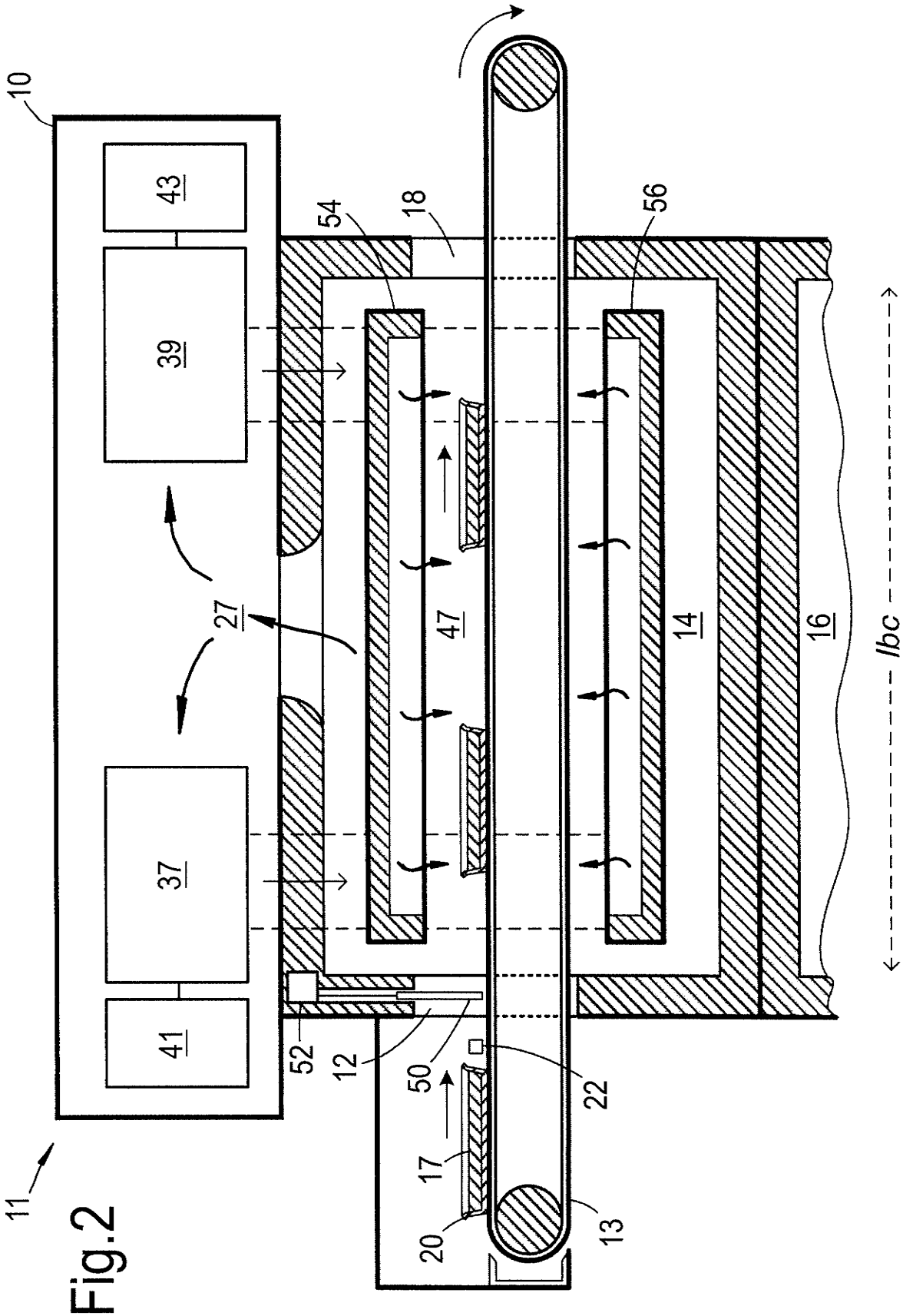


Fig.2