May 27, 1941. A. S. T. LAGAARD 2,243,710

DOUGHNUT MACHINE

Filed March 8, 1940 2 Sheets-Sheet 1

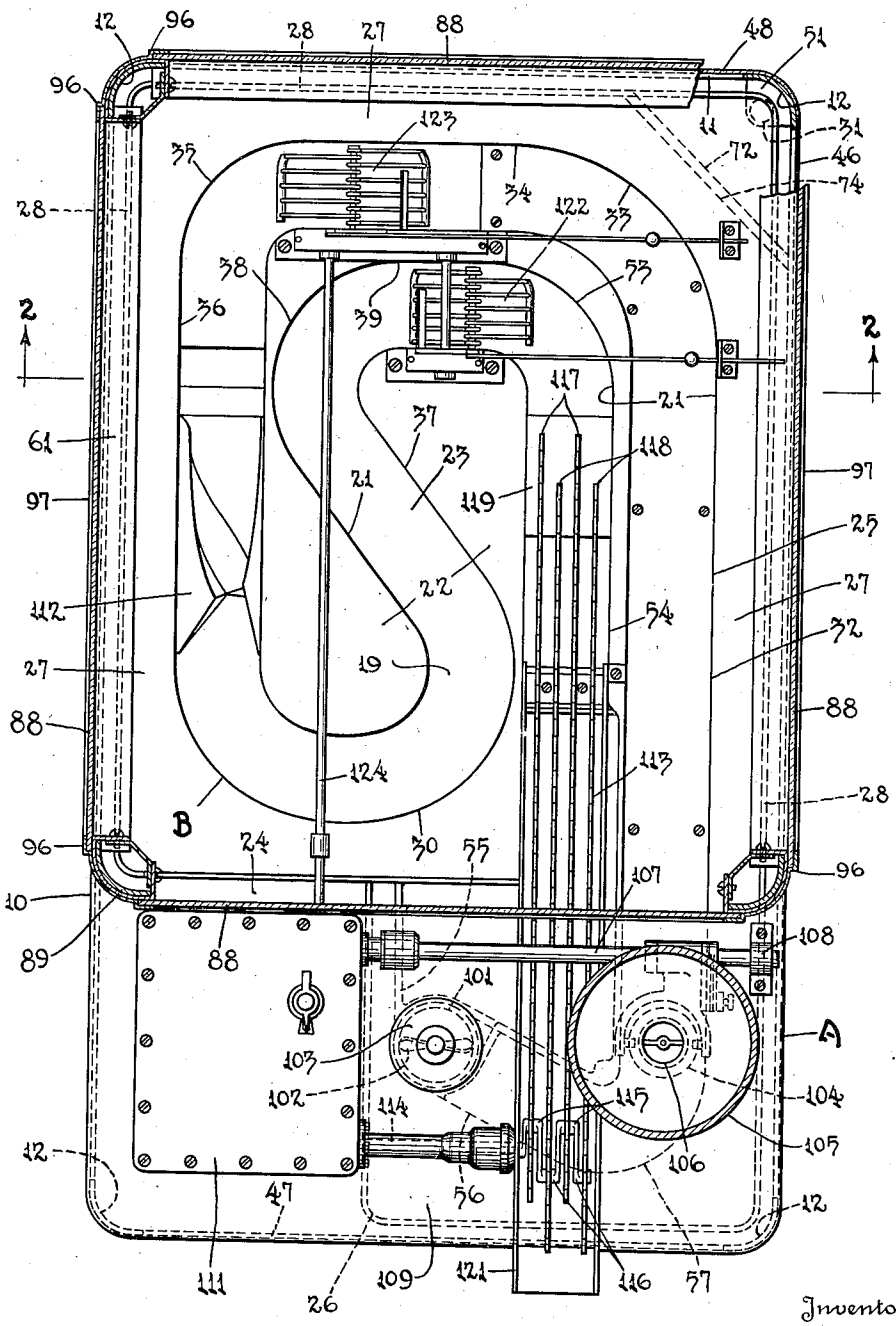


Fig. 1

Inventor

Alexander S.T. Lagaard

By Caswell & Lagaard

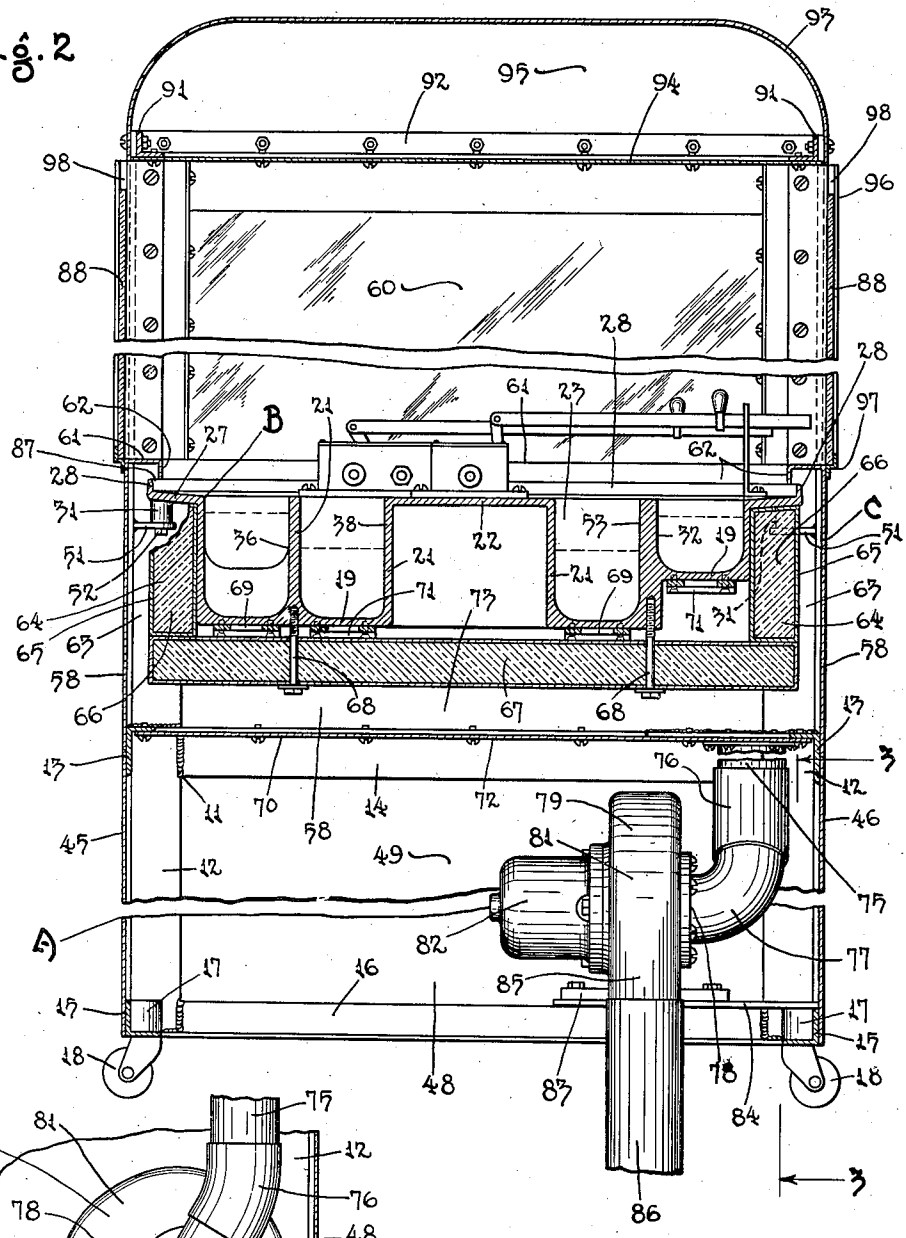
Attorneys

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Fig. 2



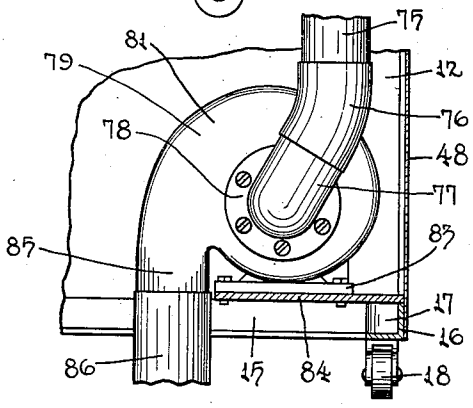


Fig. 3

Inventor

Alexander S. T. Lagaard

By Caswell & Lagaard

Attorneys

Patented May 27, 1941

2,243,710

UNITED STATES PATENT OFFICE

2,243,710

DOUGHNUT MACHINE

Alexander S. T. Lagaard, Minneapolis, Minn., assignor to Dough-King, Inc., Minneapolis, Minn., a corporation of Minnesota

Application March 8, 1940, Serial No. 322,921

11 Claims. (Cl. 53—7)

My invention relates to doughnut machines and particularly to the type utilizing a case enclosed at the sides by transparent panels and having a kettle therein, and has for an object to provide a doughnut machine in which the fumes are effectively removed from the machine.

Another object of the invention resides in providing a doughnut machine in which a suction is created within the case to remove the fumes therefrom.

An object of the invention resides in providing a doughnut machine in which fresh air is drawn into the case and caused to travel along the transparent panels to prevent deposit thereon of the cooking liquid from the fumes thereof.

Another object of the invention resides in providing a doughnut machine in which the fumes are drawn downwardly and out of the case.

A feature of the invention resides in providing a doughnut machine in which the fumes are drawn out of the chamber above the kettle through an inlet situated along the periphery of the cooking kettle.

Another object of the invention resides in providing a doughnut machine in which the blower and all pipes connected to the same are concealed within the case of the doughnut machine below the kettle.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a plan sectional view of a doughnut machine illustrating an embodiment of my invention.

Fig. 2 is an elevational cross sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary elevational sectional view taken on line 3—3 of Fig. 2.

In the drawings I have shown a doughnut machine A which consists of a case 10 including a framework 11. This framework comprises four uprights 12 situated at the corners of the case, which uprights have welded to them longitudinally extending intermediate frame members 13 and transversely extending intermediate frame members 14. The uprights 12 further have secured to them, at their lower ends, lower longitudinal frame members 15 and lower transverse frame members 16. These frame members are constructed to lie flush with the outer surfaces of the uprights 12. The frame members 15 and 16 have attached to the same at the localities of the uprights 12, bosses 17 which support caster wheels 18 by means of which the case is supported on the floor. If desired, other types of supports may be used instead of the caster wheels 18.

Attached to the framework 11 upon the exterior thereof are a number of sheet metal panels which provide side walls 45 and 46 and end walls 47 and 48. These panels may be secured to the uprights 12 and to the frame members 13, 14, 15 and 16 in any desired manner as by means of screws, not shown. These panels extend only one-half way up the outer flanges of the frame members 13 and 14 for a purpose to be subsequently more fully described. If desired, one of the panels, for instance the panel forming the wall 46, may be made removable or in the form of a door to give access to the interior of the case 10.

Within the framework 11 is disposed a cooking kettle B which is constructed with a bottom 19 and with vertical walls 21 extending upwardly therefrom. The vertical walls are connected at their uppermost ends with upper walls 22, and the various walls are so arranged as to form a channel 23 which extends throughout the major portion of the kettle and which provides a way along which the doughnuts may travel. The kettle B has one corner of the same removed as designated at 24, leaving a main portion 25 of the width of the case 10 and of a length equal to about two-thirds of the length of the same. This construction also provides an extension 26 to the kettle which extends up to the end wall 47. The kettle B is constructed with a ledge 27 extending about the margin of the same, which terminates in a lip 28 projecting upwardly from the extreme edge thereof.

The kettle B is supported on a number of brackets 51 which are welded to the uprights 12. Bosses 31 formed on the underside of the ledge 27 rest on these brackets. Screws 52 extending through said brackets and threaded into the bosses 31 hold the kettle properly supported within the framework 11.

The channel 23 is arranged to provide a straight run 32 which commences in close proximity to the wall 47 and follows along the wall 46. The channel 23 at the end of the run 32 makes a curve 33 which leads into another straight run 34 following along the wall 48. At the end of this run the channel has another curve 35 which leads into still another straight run 36 which follows along the wall 45. At the end of the run 36 the channel is constructed with a loop 30 which communicates with a diagonally

extending straight run 37. The latter run is connected by a curved portion 38 with another straight run 39, parallel with the run 34. The run 39 is connected to a curved run 53 which in turn is connected to another straight run 54. The run 54 discharges into a reservoir 55 which is merely an enlargement of the said run. From this reservoir a short run 56 is provided which forms part of a loop 57 connected to the beginning of the run 32.

The walls 45, 46, 47 and 48, as well as the frame members 13 and 14, are disposed below the kettle B. Adjacent the said kettle are provided extensions 58 of the sheet metal panels which form the walls 45, 46, 47 and 48, which extensions extend upwardly above the ledge 27 and the lips 28 thereon. These extensions have laterally and inwardly projecting flanges 61 which terminate in downwardly turned lips 62. By means of this construction a guard is provided which is spaced from the lip 28 and ledge 27. The kettle B at the locality of the lip 28 is smaller in dimensions than the interior of the case C so that a space 63 is provided which extends completely about the kettle and separates the kettle from the case to prevent transmission of heat from the kettle to the case.

To further assist in preventing transmission of heat from the case to the exterior a circumferentially extending insulating pad 64 is employed which projects from the outermost walls of the way 23 to the edge of the ledge 27. This insulating pad may be constructed as a sheet metal container 65 of the desired form having a filling 66 of insulating material therein. The height of the pad 64 is slightly greater than the depth of the kettle B. Disposed beneath the pad 64 is a horizontal insulating pad 67 constructed in the same manner. This pad is attached to the kettle proper by means of bolts 68 which pass through said pad and are threaded into portions of the kettle disposed outwardly of the channel in the same. By means of this construction the pad may be removed to expose the electric heaters 69 which are mounted underneath the kettle and attached to the bottom 19 in any suitable manner, as by means of clamp bars 71, shown in the drawings.

The case C is constructed with two additional uprights 89 which are attached to the frame members 13 and to which the extensions 58 are secured. These uprights and the uprights 12 at wall 48 project upwardly above the kettle B. These four uprights have detachably secured to them at their upper ends longitudinally extending upper frame members 91 and transverse frame members 92. These frame members support a hood 93 which encloses the upper portion of the case C. A plate 94 is secured to the undersides of the frame members 91 and 92 and closes the interior of the case C above the kettle B. The space 95, formed between the hood 93 and the plate 94, serves to retard heat transmission from the interior of the case C to the exterior and also provides a space in which electric lights for illuminating the case C and a receptacle for reserve cooking liquid may be contained. These features not forming any part of the present invention have not been shown in the drawings. The case C includes four glass panels 88 which extend upwardly above the walls 45, 46, 47 and 48. These panels are guided for sliding movement in guides 96 secured to the uprights 12 and 89. These glass panels rest on supporting strips 97 which are attached to the extensions 58. By means of this construction a chamber 60 is formed above the portion 25 of the kettle B. It will be noted that the panels 88 fall short of the hood 93 so that air inlets 98 are provided at the upper portion of the case by means of which air may enter into the chamber 60 of the case.

The angle frame members 13 and 14 of frame 11 are disposed somewhat below the insulating pad 67. To the upper flanges of these frame members is attached a bottom 70 which is formed partly from a plate 72. The bottom 70 is situated below the pad 67 and forms in conjunction therewith a chamber 73. This chamber is in communication with the passageway 63, previously referred to.

In the corner of the case C formed between the walls 46 and 48 thereof is provided a shelf 74 constructed of sheet metal which is welded to the horizontal flanges of the frame members 13 and 14. This shelf forms part of the bottom 70. The plate 72 is also secured to this shelf. The shelf 74 has attached to it a conduit nipple 75 which is connected by means of two conduit elbows 76 and 77 to the inlet 78 of a suction blower 79. Blower 79 is of conventional form and is provided with a rotor, not shown, contained within a case 81 and driven by an electric motor 82. This blower is provided with a base 83 which rests upon a shelf 84, similar to the shelf 74, which latter shelf is attached to the upper edges of the vertical legs of the channel frame members 15 and 16 at a locality beneath the shelf 74. The blower case 81 is provided with a discharge outlet 85 which has connected to it a conduit 86 which may lead exteriorly of the building in which the doughnut machine is installed or which may be connected to any suitable vent. When the blower 79 is operated, suction is created in the chamber 73 of the case and in the passageways 63 and the fumes created in chamber 60 caused to enter these passageways through the slit or opening 87 formed between the lip 62 and the lip 28. These fumes are thus drawn out of the chamber 60 from about the periphery of the cooking kettle B and are thus uniformly removed from the case. Due to the inlets 98 the blower 79, in addition to withdrawing fumes from the cooking liquid in the kettle B also draws a film of air along transparent panels 88 which, together with the fumes, is removed by the blower. By causing the air to enter the case at the upper ends of the glass panels and to travel downwardly along the same, an air screen is provided which prevents deposit by the fumes in the chamber 60 of globules of cooking liquid upon the transparent panels. In this manner the transparent panels are maintained clear and clean so that the interior of the doughnut machine is readily visible and so that the operation of the machine can be clearly noted.

Attached to the uprights 89 and to the uprights 12, at wall 47, is a table 109 which is situated above the extension 26 of the kettle B. This table supports certain of the parts of the doughnut machine, as will hereinafter become apparent.

In the reservoir 55 is provided a vertical tubular duct 101 which communicates at its lower end with the bottom of the said reservoir. In this duct is disposed a propeller or elevator 102 which is mounted on the armature shaft of a motor 103. The duct 101 communicates at its upper end with the run 57 of channel 23, thus discharging cooking liquid into said channel

from which it flows throughout the course of the channel and is returned into reservoir 55.

Situated at the beginning of run 32 of channel 23 is a doughnut former 104 which comprises a receptacle 105 for dough and a cutter 106 connected therewith. Such construction being well known in the art will not be described in detail in this application. The cutter 106 is operated by an auxiliary shaft 107 journalled in a bearing 108 carried by the table 109. This shaft is driven from a transmission carried within a transmission housing 111 which, together with the former 104, is mounted on the table 109.

In the run 36 of channel 23 is arranged a twisted tubular turner 112. This turner inverts the doughnuts after the same have been cooked a predetermined length of time so that the said doughnuts may be cooked equally on both sides thereof.

In the run 54 of channel 23 is disposed an ejector 113 for removing the cooked doughnuts from the cooking liquid. This ejector comprises a shaft 114 which is constantly driven from the transmission within the housing 111. This shaft has mounted on it oppositely extending cranks 115 and 116. Sets of toothed blades 117 and 118 are mounted on the said cranks and are adapted to be alternately raised and lowered as the shaft 114 rotates. The lower ends of these blades slide upon an inclined rest 119 which is mounted on the bottom 19 of the cooking kettle B, in the portion of the run 54 leading from the curved run 53. It will be readily comprehended that, as the doughnuts reach the said blades, the doughnuts are elevated and progressed upwardly and outwardly of the cooking kettle B. The ejector 113 is disposed within a trough 121 which directs the doughnuts upon leaving the ejector outwardly of the machine.

For controlling the rate of travel of the doughnuts along the channel two control devices 122 and 123 are employed. These control devices operate to allow the doughnuts, one at a time, to enter the turner 112 and the ejector 113. These control devices are operated by a shaft 124 driven from the transmission within the housing 111 and are moved periodically at predetermined intervals. Inasmuch as any desired construction may be used for this purpose, and since this construction does not form a particular feature of the invention, the details thereof have not been shown, nor will the same be described specifically. Where the machine is of fairly large capacity, the control devices 122 and 123 may be omitted and the rate of flow of the cooking liquid utilized to time the cooking of the doughnuts.

In the operation of the doughnut machine the blower 79 functions to create a vacuum within the chamber 73 and passageway 63, thus drawing the fumes within the chamber 60 in the upper portion of the case above the kettle B and out of the same. At the same time air is drawn in through the air inlets 98 which travels downwardly along the transparent panels 88 and prevents deposits of globules of cooking liquid from the fumes and upon said panels. By means of this construction the air passing along the panels forms a screen which protects the panels from the heat, as well as maintaining the same clean. In this way the panels are prevented from becoming uncomfortably hot and by means of the spacing of the kettle from the walls of the case and due to the insulation used, the entire exterior of the machine is maintained at a relatively low temperature, as compared with the interior of the machine.

My invention may be embodied in any type of doughnut machine without appreciably increasing the cost thereof. My invention permits of keeping the machine clean and sanitary and prevents injury to the operators or spectators of the machine in case the same is handled or touched.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case and spaced from certain of said walls to provide an air passageway along the same, said case providing a chamber above the cooking kettle in communication with said passageway along the periphery of the kettle, and means for creating a suction below said kettle to draw the fumes from said chamber downwardly through said passageway and out of the case.

2. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case and spaced from certain of said walls to provide an air passageway along the same, said case providing a chamber above the cooking kettle in communication with said passageway along the periphery of the kettle, said case being closed beneath the kettle, and a suction conduit connected to said case at a locality beneath said passageway.

3. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case and spaced from certain of said walls to provide an air passageway along the same, said case providing a chamber above the cooking kettle in communication with said passageway along the periphery of the kettle, and means constituting a bottom extending across said case at a locality beneath said kettle and forming a closed chamber beneath the kettle communicating with said passageway, and a suction conduit extending through said means and communicating with said second named chamber.

4. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case, said cooking kettle having a ledge projecting outwardly therefrom and a lip extending upwardly from the outer edge of said ledge, said lip being spaced from certain of the walls of said case to provide a passageway between the cooking kettle and the case, a guard issuing inwardly from certain of the lateral walls of the case and disposed above said ledge, said guard having a lip depending therefrom and extending toward the lip on said ledge, said second named lip being disposed in spaced relation to the first named lip to provide an inlet to said passageway, said case providing a chamber above the kettle communicating with said inlet, and means for creating a suction beneath said kettle to draw fumes from said chamber downwardly through said passageway and out of the case.

5. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case, said cooking kettle having a ledge projecting outwardly therefrom and a lip extending upwardly from the outer edge of said ledge, said lip being spaced from certain of the walls of said case to provide a passageway between the cooking kettle and the case, a guard issuing inwardly from certain of the lateral walls of the case and disposed above said ledge, said guard having a lip depending therefrom and extending toward the

lip on said ledge, said second named lip being disposed inwardly of said first named lip to form an inlet to said passageway at the periphery of the kettle, said case providing a chamber above the kettle communicating with said inlet, and means for creating a suction beneath said kettle to draw fumes from the chamber in said case above the kettle downwardly through said passageway and out of the case.

6. In a doughnut machine, a case having lateral walls a cooking kettle within said case forming in conjunction with said case an upper chamber above said kettle and a lower chamber below said kettle, said case providing an air passageway along certain of said walls communicating with said lower chamber, means forming an inlet to said passageway extending about the periphery of the kettle and communicating with the upper chamber, and means for creating suction in the lower chamber to withdraw the fumes downwardly through said passageway and out of the case.

7. In a doughnut machine, a case having lateral walls, a cooking kettle within said case forming in conjunction with said case an upper chamber above said kettle and a lower chamber below said kettle, said case providing an air passageway along certain of said walls communicating with said lower chamber, means forming an inlet to said passageway extending about the periphery of the kettle and communicating with the upper chamber, and means for creating suction in the lower chamber to withdraw the fumes downwardly through said passageways and out of the case, said case having an air inlet at the upper portion thereof communicating with the upper end of the upper chamber.

8. In a doughnut machine, a case having lateral walls, a cooking kettle within said case forming in conjunction with said case an upper chamber above said kettle and a lower chamber below said kettle, said case providing an air passageway along certain of said walls communicating with said lower chamber, means forming an inlet to said passageway extending about the periphery of the kettle and communicating with said upper chamber, and means for creating suction in the lower chamber to withdraw the fumes downwardly through said passageway and out of the case, said case having an air inlet at the upper portion thereof communicating with said upper chamber, said air inlet being situated at a locality substantially above the inlet to said passageway.

9. In a doughnut machine, a case having lateral walls provided with transparent panels at the upper portions of the same, a cooking kettle within said walls forming in conjunction with said case an upper chamber above said kettle bounded by said transparent panels, and a lower chamber below said kettle, said case providing an air passageway along certain of said walls communicating with said lower chamber, means forming an inlet to said passageway extending about the periphery of the kettle along certain of the walls of the case, and means for creating suction in the lower chamber to withdraw the fumes downwardly through said passageway and out of the case, said case having air inlets in the same at the localities of the upper ends of said transparent panels whereby fresh air is drawn into the case and caused to travel downwardly along the panels to form an air screen between the fumes within the case and the transparent panels.

10. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case, said case providing a chamber above said kettle, said cooking kettle having lateral walls and a ledge projecting outwardly therefrom and a lip extending upwardly from the outer edge of said ledge, an insulating pad extending perimetrically about the lateral walls of the kettle and situated below said ledge, said lip and pad being spaced from certain of the walls of the case to provide a passageway therebetween, and means for creating a suction beneath said kettle to draw fumes from the chamber in said case above the kettle downwardly through said passageway and out of the case.

11. In a doughnut machine, a case having lateral walls, a cooking kettle disposed within said case, said case providing a chamber above said kettle, said cooking kettle having lateral walls and a ledge projecting outwardly therefrom and a lip extending upwardly from the outer edge of said ledge, an insulating pad extending about said lateral walls and disposed beneath said ledge, another insulating pad disposed beneath the bottom of the kettle and secured thereto, said lip, first named pad and second named pad being spaced from certain of the walls of the case to provide a passageway therebetween, means forming a bottom beneath the kettle spaced from the second named insulating pad to form a lower chamber therebetween, and means for creating suction in said lower chamber to withdraw fumes through said passageway from the chamber above the kettle and out of the case.

ALEXANDER S. T. LAGAARD.