

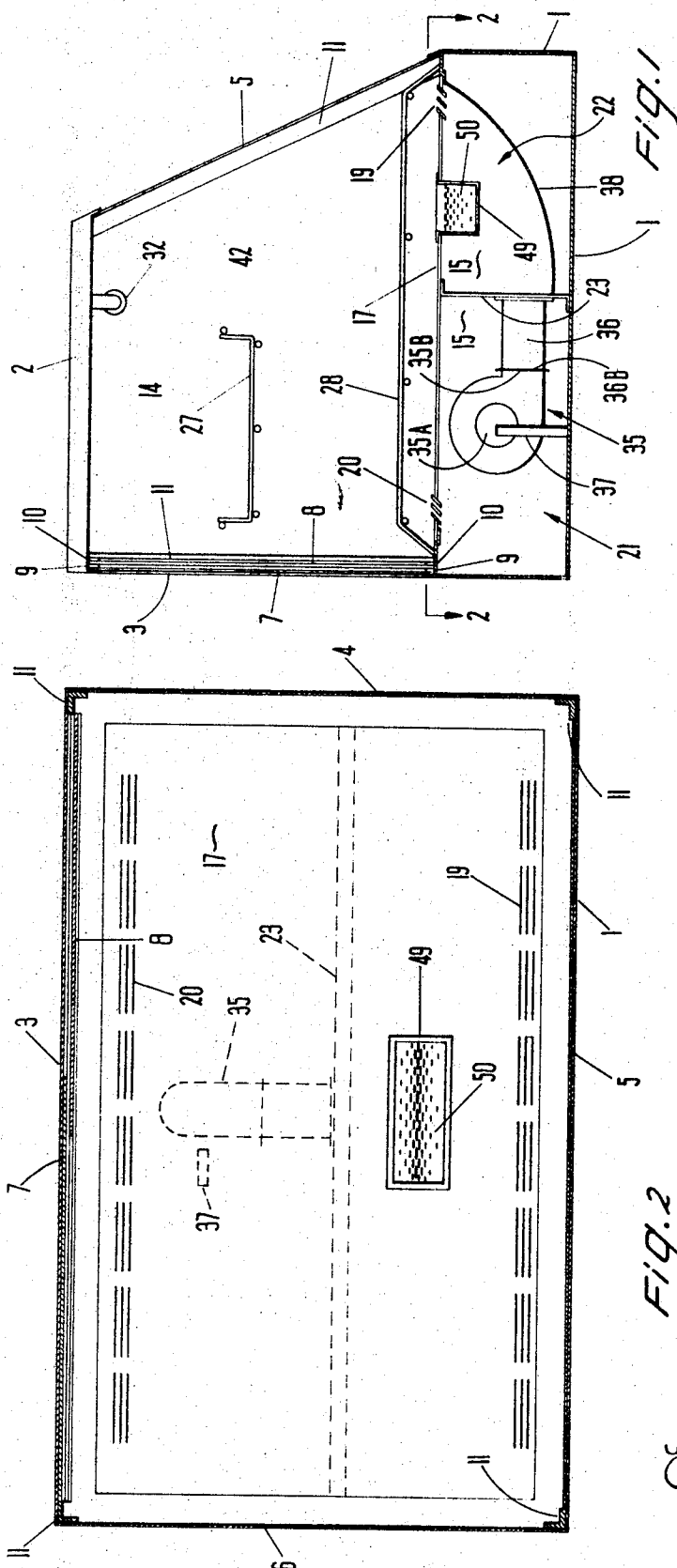
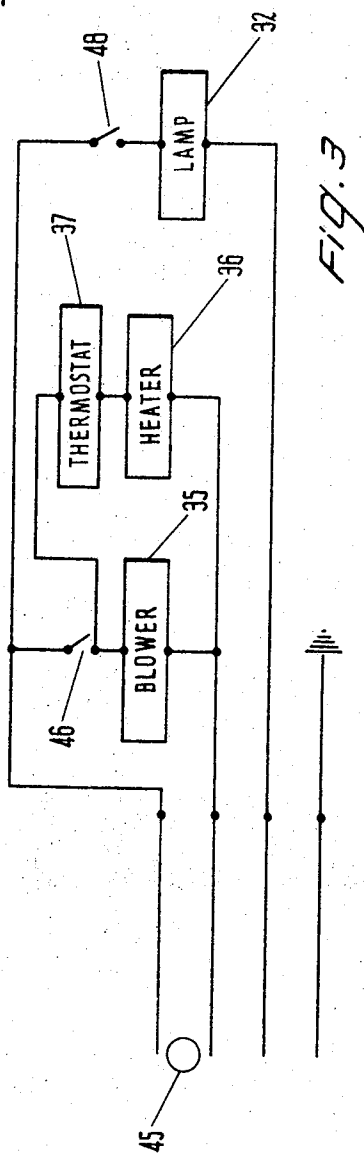
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HEATED DISPLAY CASE

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HEATED DISPLAY CASE

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6 Claims

ABSTRACT OF THE DISCLOSURE

A display case for displaying hot foods comprising enclosing transparent sidewalls, a bottom and a top. A horizontally extending divider separates the casing into upper and lower sections with the upper section adapted to receive hot food for display. The lower section is divided by a vertically extending divider into a first and a second plenum. Each plenum is connected by an aperture to the upper section. A heater and pump positioned in one plenum is designed to pump heated air directly into the second plenum for circulation therefrom into the upper section and thence back to the first plenum.

SUBJECT MATTER OF THE INVENTION

The present invention relates to a display case and in particular to a display case designed for displaying and maintaining food hot.

BACKGROUND OF THE INVENTION

It has become common practice to commercially display cooked foods such as chicken, turkey, etc., in supermarkets and the like in heated display cases. It is important in displaying such products to maintain the interior of the display area at uniform elevated temperatures with a selected humidity. In this connection, for example, health regulations require that the cooked chicken be displayed in cases under conditions in which the inside of the chicken is maintained at a minimum temperature of 140° F.

Display cases which have been in use heretofore purport to meet these requirements by providing heating mechanisms of a wide variety of sorts. Perhaps the most common means of displaying heated foods today in a display case is to arrange a case with a radiant heating element adjacent to the products being displayed. These systems however, are not satisfactory because they are incapable of assuring continued and uniform elevated temperature over the entire area of the display case. And although testing thermometers indicate the surface temperature of products such as chicken are maintained at 140° F. or more, careful examination of these cases and their contents often reveals that other portions of the chicken are not maintained at temperatures in excess of 140° F. In addition, the cases which have been used heretofore require considerable energy to maintain the minimum temperatures required. Thus, for example, it is common for display cases of the type described to require heaters that consume energy in the order of 3,000 watts for purposes of maintaining a temperature in excess of 140° F. for a case of approximately five feet in length by three feet in height and three feet in depth. Moreover, display cases commonly available today have heating units located in the display area thus limiting the available space for display and in addition providing a unit which is not attractive.

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BRIEF DESCRIPTION OF THE INVENTION

It is therefore an object of the present invention to provide an improved heated display case which is capable of displaying foods such as cooked chickens and the like that are maintained within the display case at uniform temperatures in excess of 140° F. and within a moist atmosphere. A further object of the present invention is to provide an improved heated display case which may be maintained at temperatures in excess of 140° F. with consumption of substantially less power than heretofore required for display cases of equivalent size. A further object of the present invention is to provide an improved heated display case in which the means for heating and distributing the heated air uniformly over the entire case is concealed beneath the compartment or section in which the heated food is displayed.

A further object of the present invention is to provide an improved heated display case which is attractive in appearance, rugged in construction and which is capable of being made at comparatively low costs in comparison with display cases which have been previously made.

In the present invention there is provided a display case designed primarily for displaying heated foods which comprises enclosing sidewalls, bottom and top with at least one of the sidewalls having transparent portions. A horizontally extending divider separates the casing into upper and lower sections. Means for supporting the items to be displayed is provided in the upper section. A vertically extending divider separates the lower section into first and second plenums. Apertures are provided in the plenums which interconnect them respectively to the upper section. A heater and pump for heating air is provided in the first plenum and is connected directly to the second plenum whereby heated air is pumped from the first plenum to the second plenum under pressure and thence to the upper section. Means are also provided for containing a quantity of water within the upper section which water may evaporate.

BRIEF DESCRIPTION OF DRAWINGS

The foregoing objects and advantages of the present invention will be more clearly understood when considered in conjunction with the accompanying drawings in which:

FIG. 1 is an end cross sectional view illustrating a preferred embodiment of the present invention;

FIG. 2 is a cross sectional view taken along line 2—2 of FIG. 1; and

FIG. 3 is a schematic of the electrical circuitry utilized in the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

The display case generally illustrated in the drawings is designed primarily for use in displaying hot foods such as cooked chickens, turkeys and other fowl as well as meats and the like. The display case is intended primarily for use in supermarkets and other similar food stores in which it is intended to display the foods for sale immediately after cooking. The display case comprises essentially a bottom 1 and top 2. The bottom is interconnected to the top by continuous sidewalls 3, 4, 5 and 6. The sidewall 3 functions as the rear of the cabinet and may be arranged as illustrated with sliding doors 7 and 8 that are adapted to slide laterally in suitably provided tracks 9 and 10. The sidewall 5 opposite the sidewall 3 functions as

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the front of the case and may be inclined rearwardly as illustrated in FIG. 1 at an angle approximately 30° to 45°. These sidewalls are interconnected one to the other by vertical stanchions or corner posts 11. Preferably all the sidewalls have their upper sections formed of transparent material such as glass. The bottom 1 and top 2 and the lower sections of the sidewalls 3 to 6 as well as stanchions or supports 10 may all be formed of stainless steel.

The interior of the display case is divided into an upper section 14 and a lower section 15 by a horizontal divider 17. The horizontal divider 17 comprises a base or platform that extends from one sidewall to the opposite sidewall and completely divides the interior of the display case in two sections. The lower section 15 is further divided into a first plenum 21 and a second plenum 22 which extend longitudinally of the casing with the plenums 21 and 22 being defined one from the other by a vertically extending divider 23. Divider 23 is secured at its lower edge to the inner surface of the bottom 1 and at its upper edge to the lower surface of the horizontal divider 17. The lateral edges of the vertical divider 23 are connected to the inner surfaces of walls 4 and 6 to completely divide the first plenum 21 from the second plenum 22. The first plenum 21 is in fluid communication with the upper section 17 through a series of apertures 20 in divider 17. The second plenum 22 is also in fluid communication with the upper section 17 through a series of apertures 19 in the horizontal divider 17. The apertures 19 and 20 extend longitudinally of and adjacent to the sidewalls 5 and 3 respectively. Preferably the apertures 19 and 20 are formed by deflecting cut out segments of the horizontal divider 17 so as to form a series of longitudinally extending air baffles. The baffles are preferably inclined from the upper edge downwardly and rearwardly so that air passing from second plenum 22 will be directed forwardly against the inner surface of the sidewall 5 while air passing from the upper section 17 will be directed from the baffles associated with apertures 20 to the rear portion of the plenum 21.

The upper section 17 is provided with a series of wire racks 27 and 28 which extend longitudinally of the display case. Wire rack 28 is preferably positioned just above the horizontal divider 17 and extends substantially the width of the display case and substantially the depth of the display case. Wire rack 27 also extends the width of the display case but preferably extends from the rear sidewall forwardly only approximately one-half of the depth of the display case.

A lamp 32, preferably fluorescent, is suitably supported and depends from the top 2 with the lamp 32 extending longitudinally of the display case just forward of the forward edge of the rack 27.

Positioned within the plenum 21 is a blower 35 and a heater 36. The blower 35 may be suitably supported on stanchions or supports centrally of the plenum 21. Blower 35 may be a conventional squirrel cage type of blower in which air is sucked into the blower through a central aperture 35A and is ejected forwardly through an outlet 35B connected directly to the input end 36B of the heater 36 which has its other end secured directly to and over an aperture in the vertically extending divider 23. Heater 36 is an electric heater with internally arranged heating coils that are adapted to heat air passing from the outlet 35B of the blower into the heater so that the air passing therethrough and into the second plenum 22 will be heated. Preferably positioned within the first plenum 21 immediately adjacent to the aperture 35A is a thermostatic control 37.

The plenum 22 is preferably provided with a false bottom 38 which is arcuate in configuration. This false bottom 38 extends longitudinally of the plenum 22 with its lower edge welded or otherwise suitably connected to the lower edge of the vertical divider 23 and its upper edge connected to the lower surface of the horizontal

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divider 17 forward of the aperture 19 and adjacent the forward sidewall 5. Side edges of the false bottom 38 are connected to sidewalls 4 and 6.

The electrical circuitry utilized in the embodiment described is illustrated in FIG. 3. In this arrangement the thermostat 37 is connected in series with the heater 36 in turn connected across the leads of the power source 45, through an on-off switch 46. In parallel with the series arrangement of the thermostat 37 and heater 36 is the blower 35. The blower 35 is also connected in series with the switch 46. The lamp 32 is connected across the terminals of the power source 45 in series with an on-off switch 48.

In the operation of this device lamp 32 may be maintained in an on position continually by closing the switch 48. When meat or other products are placed in the display case and it is desired to maintain them at an elevated temperature the thermostat is set to the selected elevated temperature and the switch 46 is closed. When the switch 46 is closed the heater will be turned on if the thermostat is also in a closed position. Simultaneously the blower 35 will be turned on and will remain in an on position continually as long as switch 46 is closed. When the temperature within the case reaches the selected point the thermostat 37 will open thereby electrically disconnecting the heater from the power source 45. The heater will remain at its off position until the thermostat 37 is closed when the temperature drops below the selected level. A trough 49 formed in divider 17 contains water 50 which evaporates to maintain a uniform humidity. Preferably the trough 49 is formed over second plenum 22 which is warmer than first plenum 21.

Having described my invention, I claim:

1. A display case comprising:

- a bottom,
- a top narrower than said bottom positioned over said bottom,
- enclosing sidewalls, connecting said top and bottom at least one of said sidewalls having transparent portions and at least one of said sidewalls inclined from said top to said bottom,
- a horizontally extending divider separating said casing into upper and lower sections,
- means for supporting items in said upper section,
- a vertically extending divider separating said lower section into a first and second plenum,
- means forming apertures interconnecting each of said plenums with said upper section, said means forming apertures of said second plenum being located adjacent said inclined sidewall,
- a heater and blower for heating air in said first plenum and blowing it directly into said second plenum whereby heated air will pass from said second plenum by way of said means forming apertures under pressure to said upper section, and
- reservoir means for containing water within and in open communication with said upper section,

2. A display case as set forth in claim 1 wherein said plenums extend longitudinally of said case, said apertures extending longitudinally of said case with the apertures to said first plenum adjacent one sidewall and the apertures to said second plenum adjacent said inclined sidewall opposite said one sidewall.

3. A display case as set forth in claim 2 wherein said means for containing water comprises an elongated container positioned over and having at least one wall thereof common with and forming a part of said second plenum, whereby heat from said second plenum is exchanged directly with said water in said reservoir.

4. A display case as set forth in claim 3 wherein said heater is a tubular member and said blower has a squirrel cage fan adapted to receive air from said first plenum and blow it through said tubular member into said second plenum and a thermostat positioned within said first plenum adjacent said blower.

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5. A display case as set forth in claim 4 having a plurality of baffles positioned to direct air flowing from said second plenum through the apertures connected thereto toward said inclined sidewall and positioned to direct air flowing from said upper section through said apertures to said first plenum toward said first sidewall.

6. A display case as set forth in claim 5 having a plurality of racks positioned in said upper section and extending longitudinally thereof.

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