Oct. 31, 1939. C. I. JUSTHEIM 2,178,042

REFRIGERATED DISPLAY STAND

Filed Sept. 7, 1937

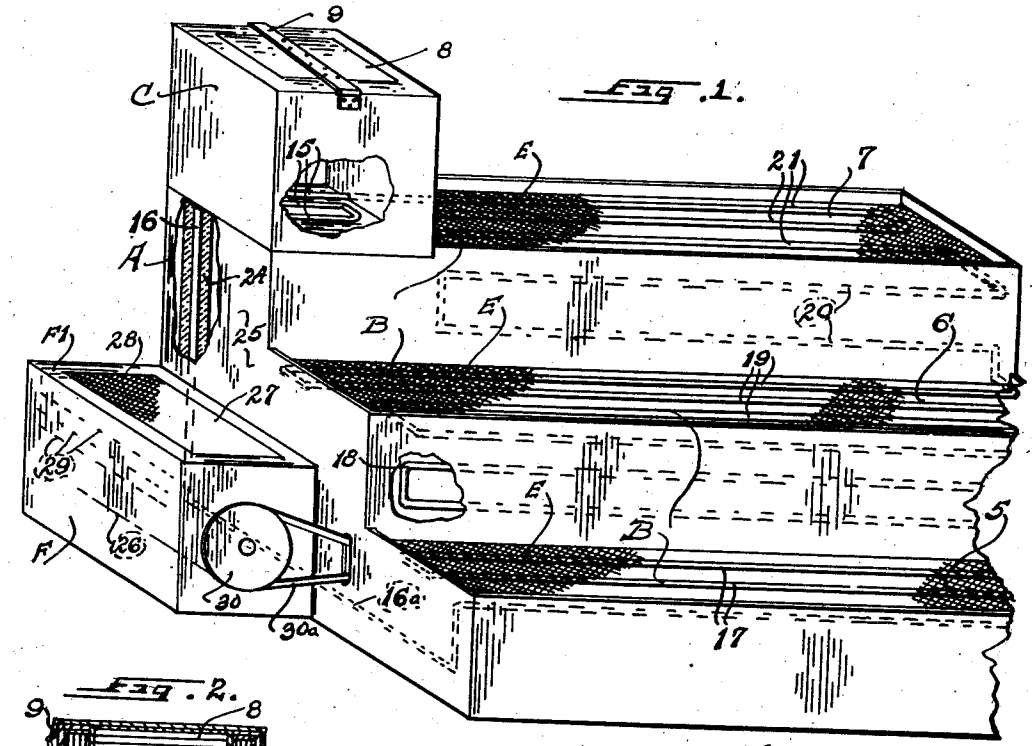


Fig. 1.

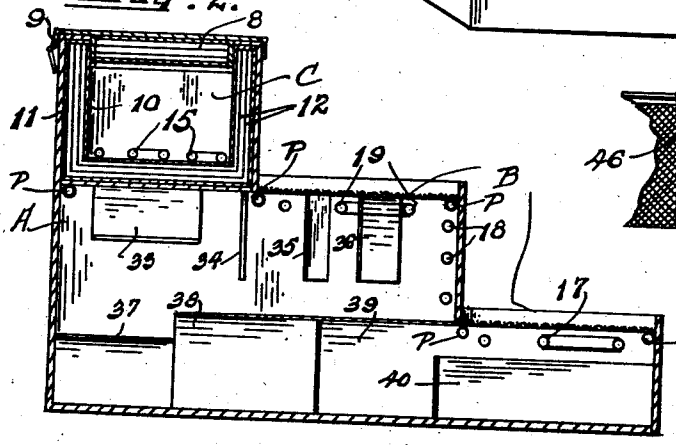


Fig. 2.

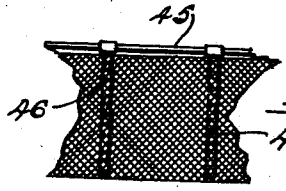


Fig. 3.

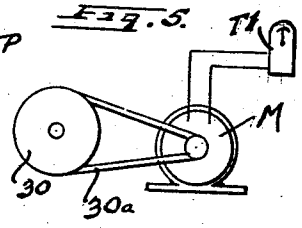


Fig. 5.

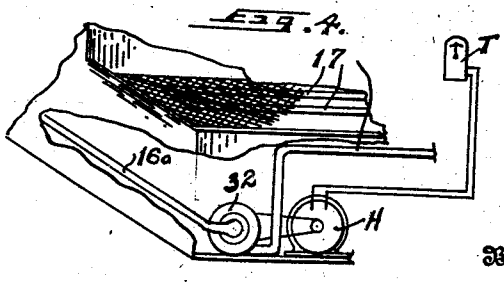


Fig. 4.

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Patented Oct. 31, 1939

2,178,042

UNITED STATES PATENT OFFICE

2,178,042

REFRIGERATED DISPLAY STAND

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Application September 7, 1937, Serial No. 162,621

6 Claims. (Cl. 62—89.5)

My invention relates to fruit and vegetable display stands for markets, grocery stores and the like and has for its object to provide a new and highly efficient refrigerated and air conditioned stand.

A further object is to provide a refrigerated vegetable display stand which is cooled by the use of solid carbon dioxide in a sealed closed and insulated casing cooling a secondary refrigerant in a closed separate circuit, said circuit being in contact with the carbon dioxide during part of its cycle for the cooling of the refrigerant in the secondary circuit.

A still further object is to provide a primary refrigerant, in an insulated casing, a secondary refrigerant in a closed circuit in contact with said primary refrigerant at one part of its cycle, and a stand in which said refrigerants are operated, said stand having perforate or screen shelves over part of the secondary circuit to cool any articles set on said stand and said stand containing a blower for air to cause air currents to pass around the secondary refrigerant coils and up through said vegetables or articles on said stand to cool them and keep them clean and free from dust, insects, and flies; the blower intake being covered by suitable filters.

A still further object is to provide a refrigerated, aerated vegetable stand having means to introduce a spray of water up onto the vegetables as needed to keep them perfectly without drying them out.

These objects I accomplish with the device illustrated in the accompanying drawing in which similar numerals and letters of reference indicate like parts throughout the several views and as described in the specification forming a part of this application and pointed out in the appended claims.

In the drawing:

Figure 1 is a perspective view of the stand parts cut away to show the interior thereof, with this stand used preferably for fruits, no water being shown.

Figure 2 is a vertical section of a two shelf stand with water distribution shown for use when vegetables are displayed.

Figure 3 is a plan view of one of the screen sections showing one way of getting water in a spray to the vegetables.

Figure 4 is a section of one portion of the case showing a pump in the secondary refrigerant circuit to create flow of the refrigerant when needed and a thermostat to control such flow.

Figure 5 is a diagrammatic view of the driving motor for the blower in the air cleaner showing a thermostatic control for said motor to control the flow of air through the stand.

In Figure 1 of the drawing I have shown the case as A, having step like front B, with separate shelves 5, 6, and 7. On one end of the casing A, I provide a carbon dioxide chamber C set above the level of the top shelf, with an insulated closure 8 for said chamber to be locked in place by a toggle lock 9 across the top thereof holding the closure firmly in place in sealed relation to the chamber. The chamber is insulated and is made by inner walls 10, and outer walls 11, set spaced apart, and carrying spaced apart sheets of metal or other types of highly reflective foil 12 therebetween for insulating the chamber and making it impervious to atmospheric temperatures.

In the bottom of the chamber C there is a coil 15 carrying a secondary refrigerant such as is used in other types of electrical, gas and mechanical refrigerators. This coil is connected by a vertical pipe 16, which is extended down one end of the casing A, and across the end at 16a to the front and there it is joined to longitudinal coils 17, which are joined to vertical coils 18, longitudinal coils 19, longitudinal coils 20 and longitudinal coils 21 along the respective steps 5, 6 and 7 and on the top step 7, the end of the coil 21 is connected with the coil 15 to make a completely closed continuous flow for the secondary refrigerant. The vertical pipe 16 is insulated by insulation 24 to keep it cool and cause the refrigerant to make its cycle. Solid carbon dioxide is then placed in the chamber C and the refrigerating system is in operation. As the refrigerant is cooled in the coil 15 it travels down the pipe 16, and as it passes through the coils in the steps of the case its temperature is naturally raised to cause a circulation. In the event that such circulation is not sufficient, I then provide external means such as a pump 32 in the secondary circuit shown in Figure 4 or a heating coil of electrical energy over some of the pipe in the upward end of the coils, or other suitable means for circulation may be employed instead of the pump.

As shown in the drawing the coils are close to the horizontal steps of the stand and each step is made with the top perforated or of screen mesh material E. At one end 25 of the casing I provide an air cleaner and circulator F, said circulator consisting of a casing F1, carrying a rotary blower shown in dotted lines 26, with the top of the casing F1 open at 27 and screened at 28. Under this screen I then provide removable filters 29 shown in dotted lines said filters to

clean all air passing into the case. The blower is open into the interior of the case and blows air into the case, depending upon the amount desired and the temperature desired in the stand. A sheave wheel 30 drives the blower 26, by a belt 30a which is driven by a motor M inside the case. A suitable cover may be placed over the sheave wheel and belt if needed.

Inside the case A I then provide suitable deflecting baffles 33, 34, 35, and 36 for the upper two shelves, and baffles 37, 38, 39 and 40 for the lower shelf and to properly distribute the air from the blower to pass up through all surfaces of the shelves with equal force.

In cases where vegetables are to be kept, such as shown in Figure 2, only the water pipes P are provided along the shelves and are perforated adjacent the screen shelves to cause a fine stream or spray of water to be carried up into the vegetables when the device is in operation. In Figure 2 the casing A is made only as a two shelf stand instead of a three shelf and the top shelf is double width, only the front portion thereof being shown as the back portion is on alignment with the case C. However if desired the third shelf may be made on a level with the top and still have a three shelf stand with less width and height.

In Figure 3 I have shown another way of spraying the water onto the vegetables which consists of a longitudinal distributing pipe 45 carrying lateral spray pipes 46 said pipes being perforated on the top sides to spray the water upwardly at an angle through the screen, and onto the vegetables.

In Figure 4 I have shown a corner of the case A, showing the pipe 16a, with a force pump 32 mounted in the secondary circuit driven by a motor H and controlled by a thermostat T said thermostat to control the motor to turn the pump on or off as the temperature in the stand requires. The thermostat T is preferably mounted about the center of the medial shelf to give the approximate temperature throughout the entire stand.

In Figure 5 I have shown the thermostat T1 to control the motor M of the blower 26, with the sheave wheel 30 and belt 30a shown to drive the fan from the motor. The motor may be turned on or off as required and the thermostat may be the same thermostat as the one shown in Figure 4 or may be an independent one if desired.

It will be obvious that if needed the back of each step like shelf of the case may be perforated if desired to allow some cold air to pass in through the back of each stack of vegetables when they are on the shelves. Also other modifications in the construction may be made in this device without departing from the spirit of the invention or the scope of the claims.

Having thus described my invention I desire to secure by Letters Patent and claim:

1. In a refrigerated display stand for fruits and vegetables the combination of a step like casing having the top of each step perforated; a solid carbon dioxide chamber in said casing, said chamber being insulated and sealed to retard sublimation of the solid carbon dioxide; a coil in said chamber; an insulated pipe leading down from said coil; other coils mounted in said casing under said perforated steps, all being connected and with the top one leading back to the coil in the solid carbon dioxide chamber to form a completely closed secondary refrigerant circuit; an air cleaner in one end of said casing; a blower in said cleaner to draw air therethrough and force it out through said perforate steps; and suitable baffles in said casing to equally divide the air from said blower and cleaner and divert it through the perforate steps in equal quantities.

2. In a display stand of the type described the combination of a closed casing having the front formed into shelves on different elevations; perforated bases in said shelves, a solid carbon dioxide chamber in said casing; a coil in said chamber leading down and connected with other coils mounted adjacent each shelf and back to the coil in the chamber to completely seal the circuit for a secondary refrigerant; means to draw clean air into said case and force it out through the shelves in equal amounts and means to introduce a spray of water through the perforate shelves onto the contents.

3. In a display stand of the class described the combination of a case; step like perforate shelves in said case; a solid carbon dioxide chamber in said case; a secondary refrigerant system mounted in said case with the coils adjacent said shelves and with the highest point of the system in the solid carbon dioxide chamber; and a blower to force air through said case and out of said perforate shelves.

4. In a display stand of the class described the combination of a case having step like shelves; screens carried in said shelves; cooling coils mounted adjacent said shelves having one portion of said coils cooled by contact with solid carbon dioxide; and a blower to force air into said case and out through said screens.

5. In a display stand of the class described the combination of a case having step like shelves with the shelves carrying screens; secondary refrigerant cooling coils mounted under and near said shelves; means to cool said coils from a primary refrigerant chamber; and a blower to force air through said case and out of said shelves causing the air to pass over said coils.

6. The elements set out in claim 5 in combination with water pipes to create a spray of water onto said screens.

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