

March 20, 1951

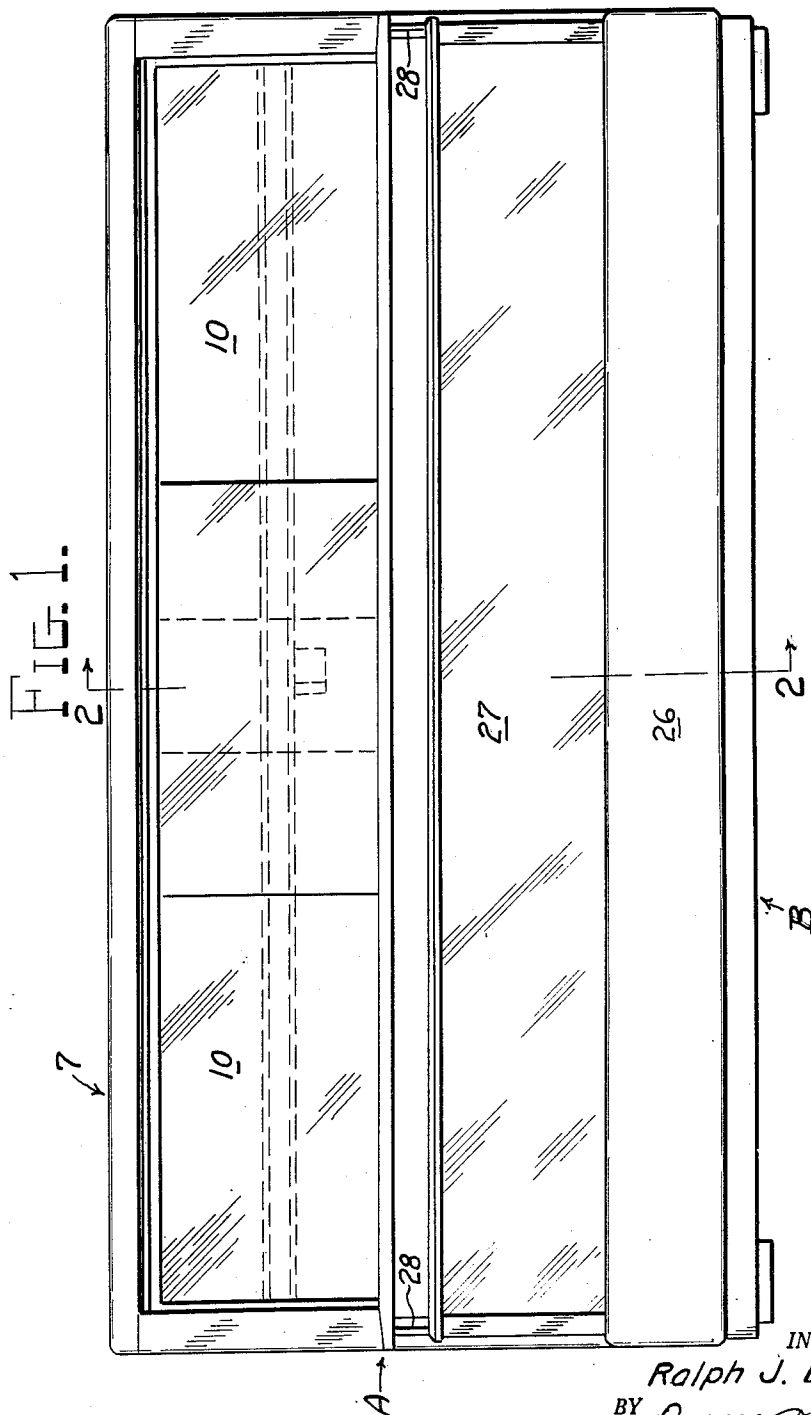
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2,545,602

MULTIPLE PURPOSE REFRIGERATED CASE

Filed Aug. 17, 1949

4 Sheets-Sheet 1



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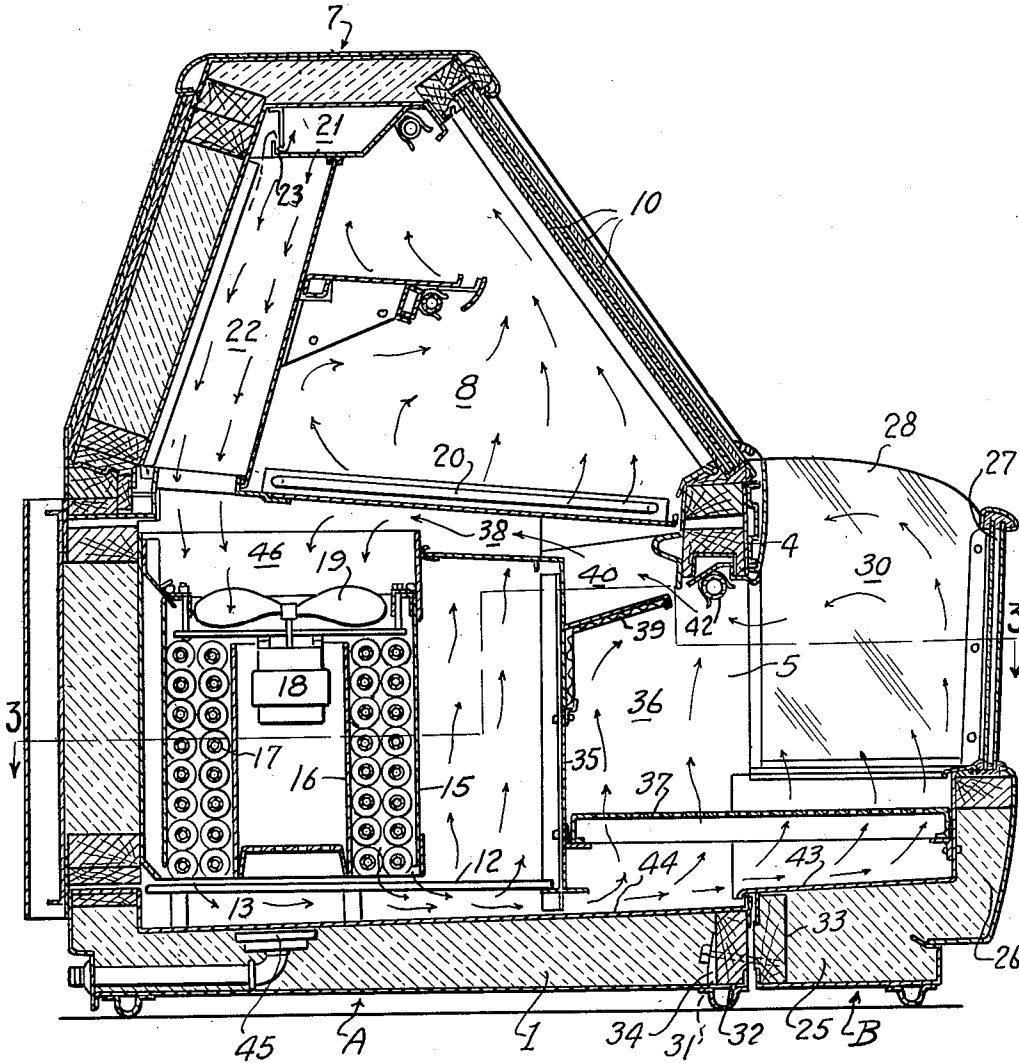
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FIG. 2.



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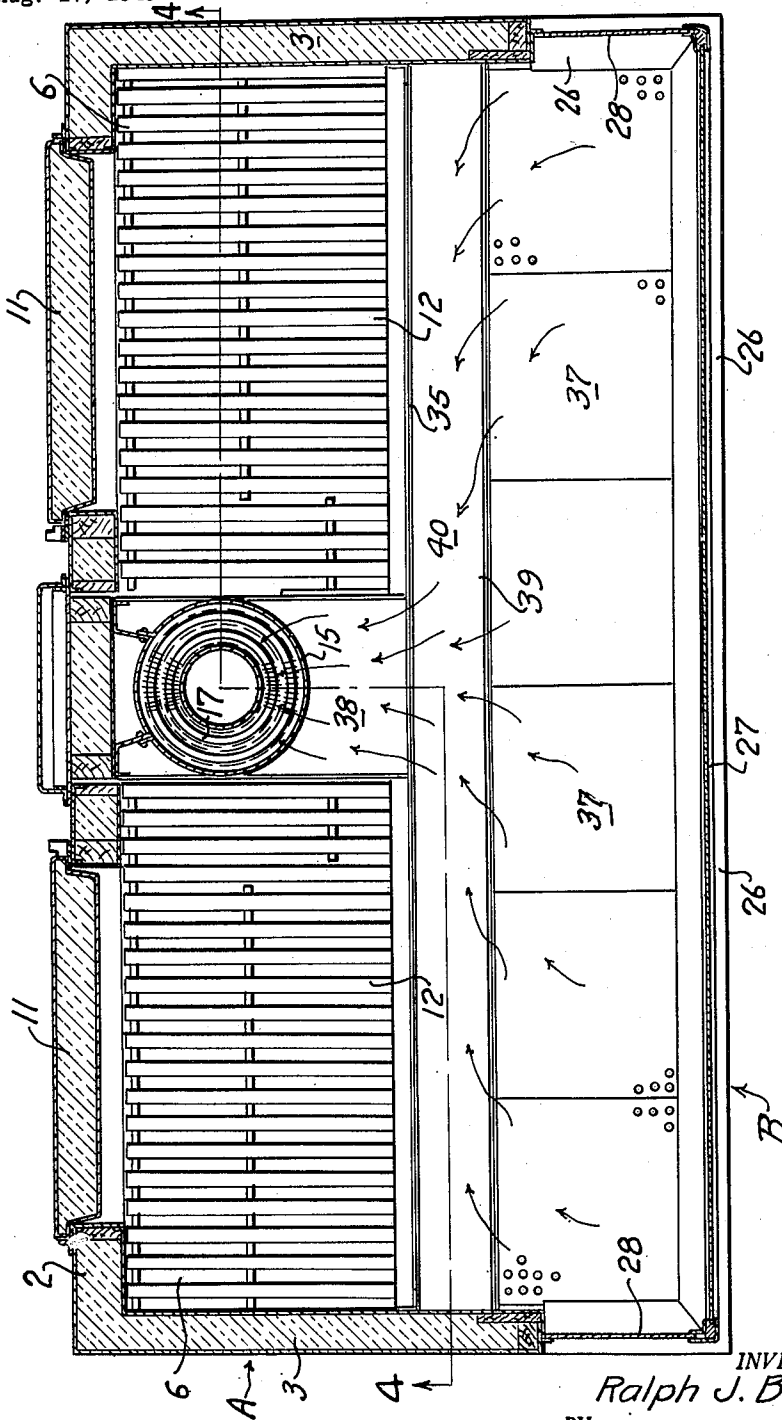
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MULTIPLE PURPOSE REFRIGERATED CASE

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FIG. 3.



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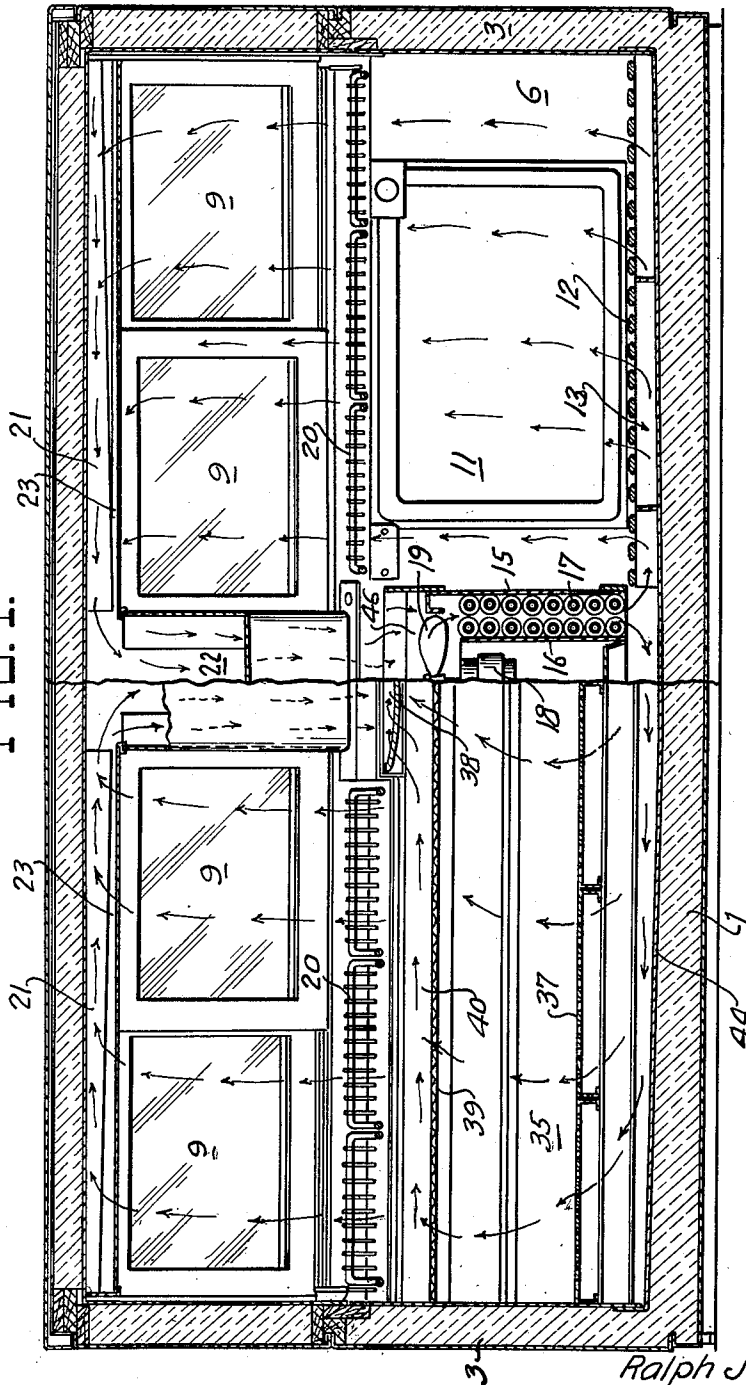
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MULTIPLE PURPOSE REFRIGERATED CASE

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4 Sheets-Sheet 4

FIG. 4.



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UNITED STATES PATENT OFFICE

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MULTIPLE PURPOSE REFRIGERATED CASE

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10 Claims. (Cl. 62—89.5)

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This invention relates to refrigerated display cases, and particularly to such a case that combines self-service with both service display and refrigerated storage features. However, either of these latter may be omitted within the spirit of the invention.

It is old in refrigerated cases to combine separate closed display and closed storage compartments wherein cold air is circulated through both from a single refrigerating and air circulating unit, but so far as I am aware this has not been accomplished in combination with an open-top self-service refrigerated display compartment having the same source of cold air supply.

The primary object of the present invention is the provision of a triple duty refrigerated case combining in a single economical and efficient manner a refrigerated open-top self-service feature with closed service display and storage features, all served by the same air cooling and circulating system, whereby to enhance the commercial value and efficiency of refrigerated display storage and service units of this character.

Further objects and advantages of the invention will be apparent from the following detailed description, and from the accompanying drawings illustrating one embodiment thereof, in which—

Fig. 1 is a front elevation of a refrigerated case embodying the invention; Fig. 2 is an enlarged fragmentary section on the line 2—2 in Fig. 1; Fig. 3 is a reduced horizontal section on the line 3—3 in Fig. 2, and Fig. 4 is a vertical section on the line 4—4 in Fig. 3.

Referring to the drawings, A designates the main body unit of the case which includes in its lower portion one or more cold storage compartments and above these the closed display and service compartment, together with the air cooling and circulating means therefor, and B designates the open-top refrigerated self-service body unit. This latter unit, in the present instance, is removably attached to the lower front portion of the main unit A and is supplied with its cooling air from the cooling and circulating means forming a part of the unit A. The main body unit A has a bottom section comprising a base or bottom 1, a rear wall 2, end walls 3, 3, rising therefrom, and a front that is open at 5 with the opening extending substantially from the bottom 1 up to the top beam marked 4. This structure forms the longitudinally spaced cold storage compartments 6, 6, and has superposed thereon a top section 7 forming the closed refrigerated display and service compartment

8 that is accessible at the rear through a plurality of openings closed by sliding doors 9 and at the front through a long front opening that is closed by a series of glass plates 10, as is customary with apparatus of this character. Nothing particularly novel is claimed for the construction and arrangement of parts of the main unit A except insofar as it is adapted to cooperate with the body unit B to form the self-service refrigerated feature of the apparatus.

Each of the cold storage compartments 6 has an access opening at the rear closed by a door 11 and has a raised grate bottom 12 forming an air circulating space 13 between it and the base 1 of the structure.

Centrally of the case and separating the two storage compartments 6, 6, is located the air cooling and circulating unit which, in the present instance, comprises a drum like shell 15 open at top and bottom with its axis vertical and having an inwardly spaced vented bottom concentric shell 16 forming an annular space within the shell 15 in which are located a series of finned refrigeration coils 17. A motor 18 is suspended in the upper end of the shell 16 and drives a fan 19 to create an air draft down through the space between the members 15 and 16 and around the coils 17. The cooled air passes downwardly from the coils through and below the grating 12, which extends under the cooling unit, and thence divides and is distributed sidewise in both directions beneath the grating and upward therethrough into each storage compartment.

The top of the storage compartments and the display compartment 8 are separated by a grating or foraminous members 20 forming the bottom of the display compartment 8. The cooled air circulation is up from the storage compartment 6 through the grating 20 and thence upward through the compartment 8 to a top return conduit 21 extending lengthwise of the top portion of the compartment 8 at each side of a central down draft conduit 22 which directs the returning air to the open top of the drum 15 of the cooling unit, as best shown in Figs. 2 and 4. The air enters the conduits 21 from the compartment 8 through slots 23 at the lower rear edge of the conduit. It is thus apparent that when the fan 19 is operating, a forced draft is set up through the cooling unit, the cold air being laterally dispersed from its lower end beneath the floor gratings 12 and thence upward through the storage compartments 6 and display compartment 8, after which the warmed air which rises to the top of

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the case enters the return conduits 21 and thence passes down through the conduit 22 to be again passed through the cooling unit, as well understood in the art.

The unit B which constitutes the refrigerated self-service feature of the case, in the present instance, is separable from the unit A and is clamped to the front side thereof in covering relation to the opening 5 in any suitable manner. In the present embodiment, the unit B comprises the base or bottom part 25 which extends upward at its front side and at its ends to form the shallow upstanding wall portions 26. This wall portion is surmounted by a front glass wall 27 and end glass walls 28. Each of these walls extends above the horizontal level of the lower edge of the beam 4 which forms the top of the opening 5. The base 25, the rear edges of its end walls 26 and the rear edges of the end plates 28 fit closely against the front side of the section A, thus giving the case A with its front extension B the appearance of a single unitary structure. The produce-receiving compartment 30 of the self-serve unit B is open at its top so that customers may reach in and select the produce desired.

The means employed in the present instance for attaching the unit B to the unit A comprises a series of lag screws 31 inserted on a downward incline forwardly through the front beam member 32 of the base 1 and threading into a corresponding beam member 33 that abuts rearwardly against the member 32. The screws are inserted through vertical slots in the member 32 to permit vertical adjustment and the heads of the screws engage wedge members 34 in a manner to cause a tightening of the members 32 and 33 together when the screw head slides down on the members 34.

The storage compartments 6 at their front sides are separated from the open front of the unit A by a vertical partition 35 extending the full length of the case and providing the chamber or air passage 36 which opens into the service compartment 30 through the opening 5 and may form a rearward extension of such compartment. The partition 35 stops short of the base or bottom member 1 of the unit A so as to permit air from the space 13 beneath the grating 12 to pass thereunder and into the communicating chambers 30 and 36. Within the chambers 30 and 36 is a bottom plate 37 of foraminous form which serves to support the produce in said chambers and also to distribute the air uniformly throughout the space beneath the plate and to permit it to pass upward therethrough into the chambers, as indicated by the arrows in Fig. 2.

The partition 35 has at its upper edge centrally of its ends a flue 38 extending rearwardly from the upper portion of the compartment 36 to the upper end or fan chamber portion of the refrigerating unit so that return air may pass from said compartment to the unit. Except for this flue, the partition 35 closes any communication between the compartment 36 and the upper portions of the storage compartment 6.

On the front side of the partition 35 is mounted a baffle 39 forming a flue 40 running the length of the case and also providing a narrow space between it and the upper front beam member 4 which tends to direct the rising air as it passes from the compartments 30, 36, and is drawn to the cooling unit through the flue 38 by the action of the fan. The flue 40 communicates centrally of the case lengthwise thereof with the return

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flue 38 so that the air entering the flue 40 from the chambers 30 and 36 passes therealong to the central flue 38 and thence into the fan chamber. One or more fluorescent or incandescent lamps 42 are mounted beneath the beam 4 or top wall of the opening 5, so as to direct light down into both compartments 30 and 36.

The interior bottom portion 25, 26 of the unit B has a liner 43 (Fig. 2) that overhangs the front upstanding lip edge of the bottom liner 44 of the base member 1, and both of these liners are rearwardly and downwardly inclined to direct any condensation or other liquids toward the drainage outlet 45. The liner 44 is also preferably inclined slightly from both ends towards the drainage outlet so as to direct liquid thereto. It is apparent in the operation of the apparatus that the storage compartment 6 and the display compartment 8 are cooled by the air flow that is directed downwardly through the coils in the cooling unit and thence dispersed endwise of the case in both directions beneath the beam grating 12 and upward therethrough and through both the storage chamber 6 and the display chamber 8 to the return top flue 21. It then passes through such top flues to the centrally disposed down flue 22 by which it is returned to the fan chamber, as is well understood in the art in connection with apparatus of this character. Some of the air that is discharged beneath the grating 12 passes rearwardly from the space 13 beneath the partition 35 and into the lower portions of the service compartments 30 and 36 beneath the grating or foraminous bottom members 37. This cold air passes upward through such members and into both of said compartments, and due to the fact that the front and end walls 27 and 28 of the compartment 30 extend above the top of the opening 5, this air, as it is warmed and by reason of the forced circulation, is caused to pass, as indicated by the arrows, through the opening 5 toward and into the flue 40 and thence to the return flue 38 to the fan chamber, designated 46. The cold air in its circulation within the open top compartment 30 will not materially spill over the walls of such compartment but will return to the cooling unit in the manner now well understood in connection with open-top refrigerated service units of this character.

This invention provides a unitary refrigerating case that combines the triple functions of a cooled storage space, a cooled display compartment and a refrigerated open-top self-service compartment.

I wish it understood that my invention is not limited to any specific construction, arrangement or form of the parts, as it is capable of numerous modifications and changes without departing from the spirit of the claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent, is:

1. In a case of the class described, which combines a cold storage compartment and a display compartment together with means for cooling and circulating air therethrough in a continuous circuit; the provision of an open-top refrigerated display compartment at a side of the cold storage compartment and exposed to the air that is cooled and circulated by said means whereby a portion of the cooled air is by-passed from the lower portion of the storage compartment and circulated through said open-top compartment and then returned to the refrigerating means.

2. In a case of the class described having a

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cooled compartment and an opening in one side of the case together with means for cooling and creating a circulation of air through said compartment, the provision of an open-top refrigerated self-service unit at a side of said case having its rear and bottom portions in unrestricted communication with said air circulating and cooling means through said side opening whereby a portion of the air cooled and circulated by said means is circulated through the open-top compartment and then returned to the cooling and circulating means.

3. In a case of the class described having a plurality of compartments, and means operable to cool air and to effect an endless circulation of air through said compartments, said case having an opening in one of its upright walls, the provision of means forming an open-top refrigerated display compartment at a side of said case with the rear of its interior in open communication with said opening with the walls of said open-top compartment extending above the top level of said opening, and means for by-passing a portion of the air circulated by said cooling and circulating means and causing it to enter said open-top compartment at its bottom portion and to then return through said opening to said circulating means.

4. In a case of the class described having a cooling compartment with surrounding walls and with an opening through one wall extending in height some distance above the bottom of the compartment, an air cooling and circulating unit for receiving warm air at the top and directing it downward into the bottom of said compartment and upward therethrough to return to said means, a partition separating said compartment from the wall having said opening, an open-top self-service unit attached to the open side of said case and forming a forward extension of the compartment between said partition and open wall with the top of said compartment at the outer side of the wall disposed at a level above the top of said wall opening, foraminous means forming a bottom for said open-top compartment and said communicating space, and means for by-passing a portion of the air circulated by said cooling and circulating means so as to direct it under and upward through said foraminous plate and into the compartment thereabove and then returning it to the circulating and cooling means.

5. In a case of the class described having front, end and rear walls and forming a lower storage compartment and an upper display compartment and having an opening in its front wall, a partition within the case rearwardly of said front wall and forming a space lengthwise of the case in communication with said opening, an extension on the front side of said case forming an open-top self-service compartment with its rear side open through said wall opening to said space and with its front and end walls extending above the level of the top of said opening, a foraminous produce support in the bottom portions of said space and open-top compartment and extending through said opening, and means for cooling and

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causing an endless circulation of air through said case compartments and also through said space and open-top compartment.

6. In an apparatus of the class described, a case having surrounding walls forming a cooling chamber, one of said walls having an opening therein, a separate unit attached to the wall of said case at the outer side of said opening and forming an open-top self-service display compartment with its rear side open to the interior of the case through said opening and with its side and end walls terminating on a level above that of the top of said opening, and means associated with the case and operable to cool and effect a forced circulation of air through said first chamber and also through said open-top compartment and then return the air to the cooling means.

7. A triple duty case of the class described having a storage compartment, a closed display compartment, an open-top self-service compartment, and a closed circuit refrigerating system including a refrigerating unit and a forced draft means and having communication with and through each of said compartment, said open-top compartments being of the type in which the cold air is introduced into the compartment through the bottom portion and passes outward therefrom through a rear opening the top of which is below the level of the top of the side walls of the compartment.

8. An arrangement as called for in claim 7 wherein the storage and closed compartments are superimposed and the open-top compartment is at the front of one of said first compartments.

9. In a refrigerated case having a storage compartment, a superposed display compartment, and an open-top refrigerated display compartment at the front of said storage compartment, cooling means below said superposed compartment, an air circulating system for directing cooled air from said cooling means through said storage compartment and through both said display compartments and back from each to said cooling means, and means for forcing the circulation of air through said cooling means and system.

10. An arrangement as called for in claim 9, wherein the circulation of cooled air from the storage compartment is up through the bottom portion of the open-top display compartment and therefrom through its rear side portion to the cooling means.

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