May 9, 1933. E. M. STRASS 1,907,680

DISPLAY COUNTER

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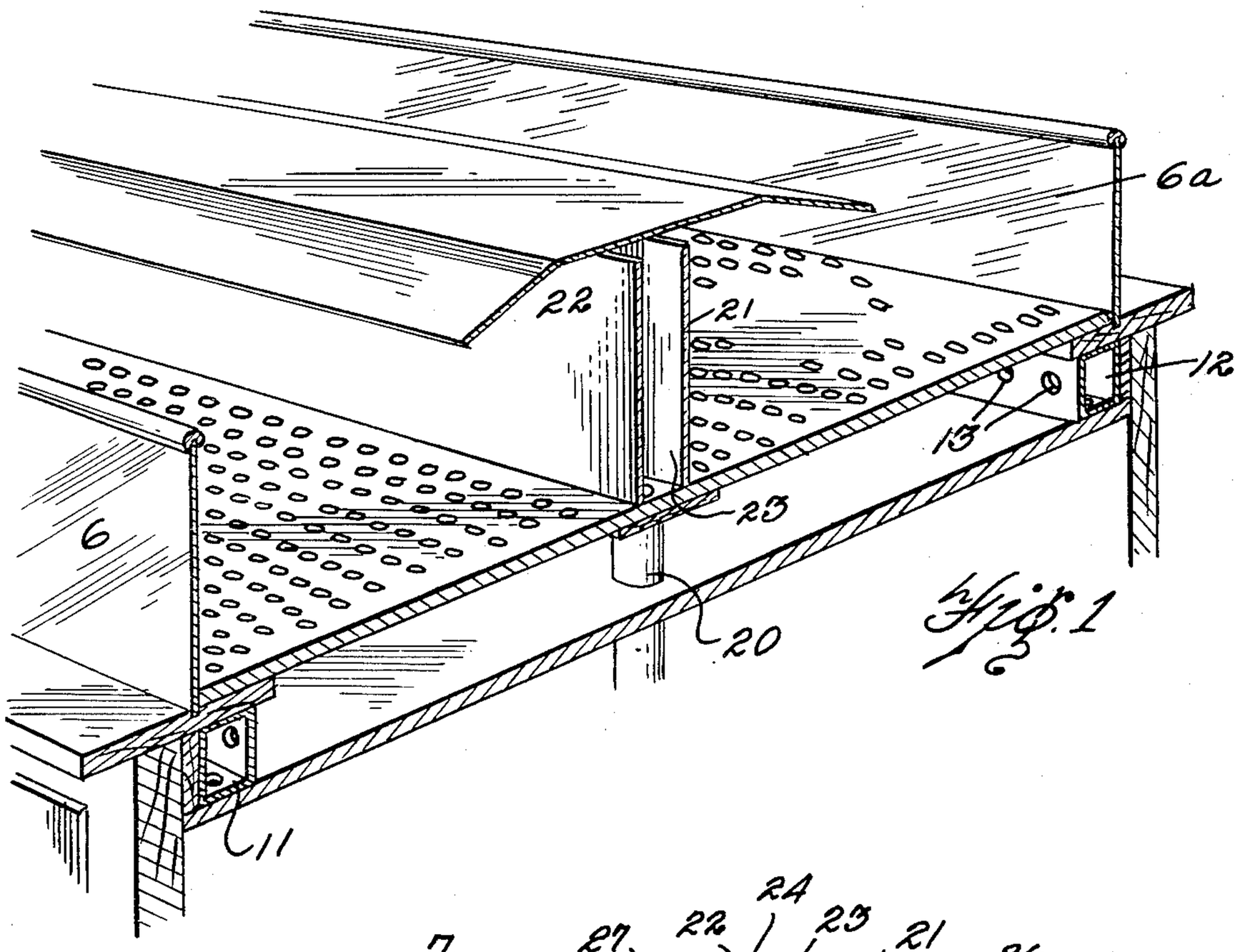

Fig. 1

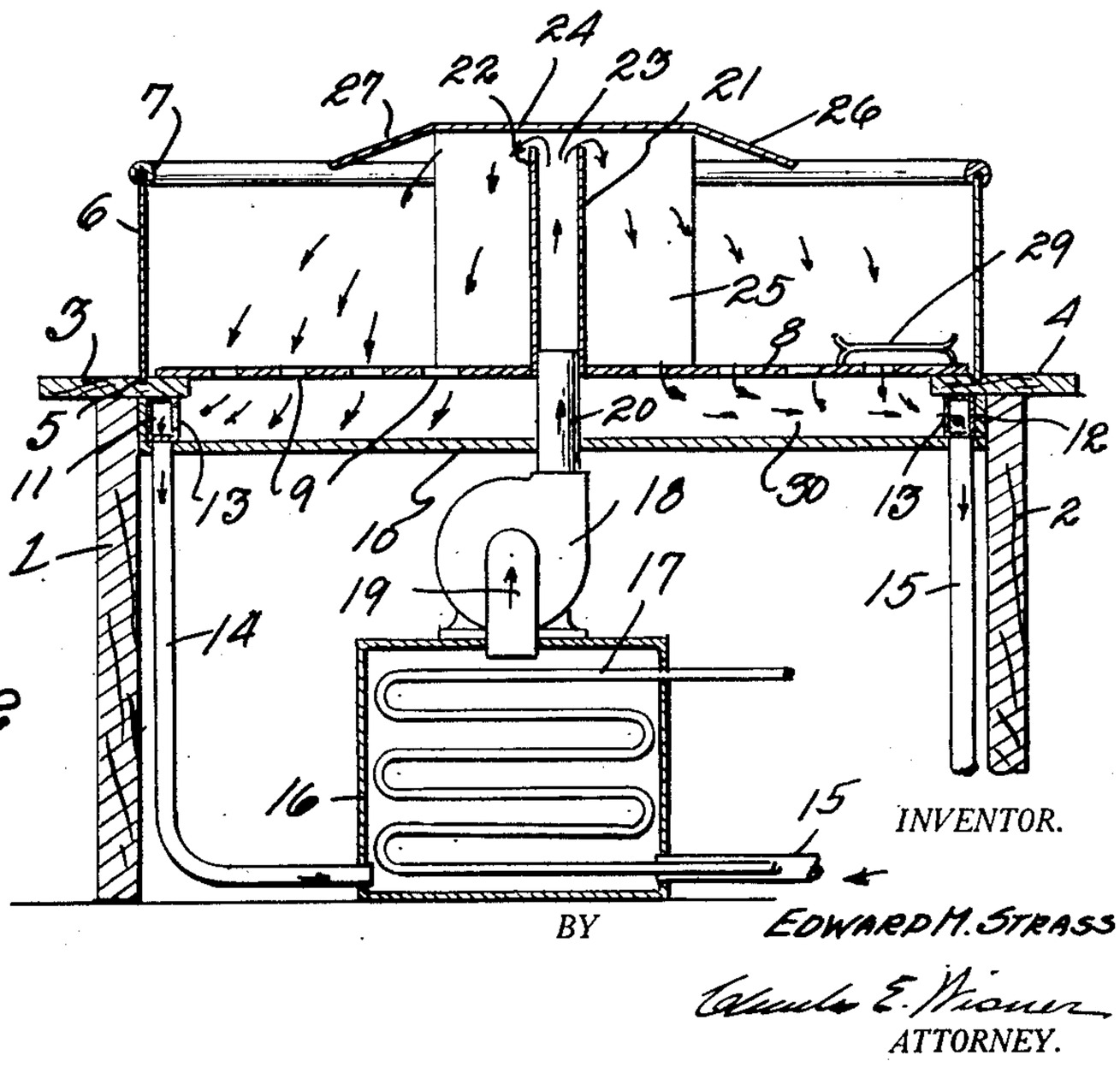

Fig. 2

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UNITED STATES PATENT OFFICE

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DISPLAY COUNTER

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This invention relates to refrigerated or cooled display counters particularly useful in the display of goods such as butter, cheese and various other commodities which may tend to soften, or melt, or lose the original shape or appearance through influence of a sufficiently high temperature of the atmosphere to cause such result, as is the case in the summer time in the North Temperate zone and more constantly the case through the southern portion thereof. The object of the invention is to provide, in conjunction with a means for causing cooled air to flow over the articles to maintain the temperature thereof sufficiently low to prevent such detrimental results, to provide a counter having a display section constantly open to permit the handling or disposition of goods by clerks or customers and permit the ready removal of goods therefrom or disposition of goods therein.

I am aware of structures previously designed for this purpose in which a refrigerating coil is so positioned in or relative to the compartment containing or displaying the goods as to cause a circulation of the air in the compartment toward and from the refrigerating coil or surface that might be directly cooled thereby.

My invention seeks to avoid the use of a refrigerating coil within the confines of the display compartment, to provide a compartment that is open to atmosphere and to provide a means for constantly passing cooled air over the articles under such condition that atmospheric air may enter the compartment, and to withdraw the air from the compartment in such manner as to cause a distribution of the air over the various articles of the compartment and to recool the air thus withdrawn in a continuous circuit.

These various objects and the several novel features of the construction of a display counter embodying my invention are shown in one of the desired forms in the accompanying drawing in which—

Fig. 1 is a perspective view of a portion of such a counter showing an end section thereof.

Fig. 2 is a cross section of such display counter showing the refrigerating or cooling apparatus in its relation to the counter.

The counter may be of various forms or shapes as may be desired for any particular installation and is here shown as being of an elongated rectangular form although it is to be realized, as is stated hereinafter, that the counter may be square or other shape in plan view.

Fig. 2 may be taken as a typical illustration of the features of construction and arrangement of the various parts in their cooperative relationship. It will be seen from the drawing that the display counter comprises side panels 1 and 2 in vertical position, on the upper end of which is secured shelves 3 and 4 and if the device be rectangular or circular in form the walls 1 and 2 and the shelves 3 and 4 preferably extend about the circumference or several sides of the counter. The shelves may be rabbeted as at 5 or otherwise provided with means to support a vertically positioned glass or transparent member 6 which extends about the periphery of the structure whether it be rectangular or other form. The upper edge of the member 6 is preferably reinforced by a frame 7. Extending from one side to the other in the form of construction here shown I provide a perforated article supporting table 8 having a multiplicity of apertures 9 practically over its entire surface as is more clearly shown in Fig. 1. Below this table or article supporting surface 8 is an imperforate horizontal wall 10 supported in any convenient manner to form a chamber 30 below the perforate table. On opposite sides of this chamber, in the arrangement here

shown, are positioned conduits 11 and 12 having apertures 13 in that face of the conduits toward the inner portion of the chamber and there are a series of such apertures along these conduits as will be understood from Fig. 1.

These two conduits 11 and 12 are respectively connected by the conduits 14 and 15 with a chamber 16 here shown as located beneath the display section of the counter and in which is positioned a coil 17 of a refrigerating apparatus (not here shown) through which a refrigerant is circulated. It is to be observed that it is not material what type or character of refrigerating apparatus is utilized and the coils here illustrated are merely illustrative of one form of construction that may be utilized. The chamber 16 is preferably closed to atmosphere and a suction fan or blower 18 is mounted in position to take air from the casing 16 as by means of a pipe 19 and discharge the same through the pipe 20 which extends upwardly through the lower wall 10 of the chamber to a point above the perforate table and may continue thereabove centrally within the space defined by the glass wall 6.

If the counter be of an elongated form I preferably provide spaced walls 21 and 22 extending centrally between the walls 6 and 6a as will be understood in Fig. 1 and the pipe 20 discharges into the channel provided between these two walls. It will be noted further that in the event an elongated structure is utilized there may be several air discharge pipes 20 leading to this space 23 between the walls 21 and 22 in order to distribute the cooled air along the display counter.

Whether one or more air discharge pipes are utilized I provide a horizontal deflector 24 above the upper edges of the walls 21 and 22, or pipe 20 should it be continued materially above the table 8, and this deflector plate may be supported at opposite ends by end members one of which is shown at 25 in Fig. 2. The deflector plate 24 is provided at opposite sides with downwardly inclined deflector portions 26 and 27, the lower edges of which preferably extend at least to the horizontal plane occupied by the upper edge of the glass walls. The space between the outer free edges of the deflectors 26 and 27 and glass wall 6 is directly open to atmosphere and provides ample space through which goods may be positioned in or removed from the display compartment enclosed by the glass frame 6 and also permits an ingress of air if conditions are such as would cause flow of air thereinto.

The goods are to be placed on the perforate table 8 and may be placed directly thereon with sufficient space between separate articles displayed as to permit a flow of air through the apertures 9 into the chamber 10 to the cooling device and if so desired the goods may be placed on display trays one form of which is suggested at 29 in Fig. 2, the purpose being to hold the goods slightly above the surface of the perforate plate 8 to avoid obstruction of the apertures therein.

The operation of the device is simple in the extreme, the blower, which may be operated in any convenient manner, exhausts the air through the conduits 11, 12, 14 and 15 drawing the same over the cooling element and discharging it upwardly against the deflector which, due to the reduction of pressure at the apertures of the table surface flows over and about the articles in the display section of the device returning through the apertures in the table 8 into the chamber 30 and thence to the conduits 11 and 12 in a constant circuit. There is therefore a forced flow of cooled air over and about the articles all of which are subject to the cooling influence of air of the same temperature. With cooled display counters heretofore used, in which a refrigerated coil was utilized in such relation to the display section that the atmosphere of the chamber was caused to circulate toward and from the refrigerating coil, the cold air passing from the coil increases in temperature as it passes away therefrom and over the goods so that the goods most remote from the coil are not subjected to air of the same temperature as the goods nearer thereto and I obviate such undesired result by causing a forced circulation of cooled air in a display compartment open to atmosphere and a deflector member is used, such for instance as the members 24, 26 and 27, to initially direct the discharged air over the goods and toward the apertures through which it is drawn by the fan.

As the suction effect produced by the fan is practically evenly distributed over the table 8 by reason of the distribution of the apertures 9, the cooled air is practically evenly distributed over and about the goods.

Any atmosphere which may be drawn into this display portion of the structure through the operation of the suction blower or fan in the casing 18 is beneficial due to its tendency to purify the air being circulated over the goods. The fan is preferably operated in such manner as not to produce a very rapid flow of air which might be productive of a drying effect upon the goods. However, by the construction described, particularly the provision of the multiplicity of apertures 9 in the table 8 and equable distribution of the air flow over the goods is obtained with the consequent result that the air moves so slowly over the goods that the drying effect is negligible. However, any drying effect through use of this apparatus

is also more or less obviated due to the tendency of the moisture to collect on the refrigerating element or the air may be otherwise moistened artificially as may be found desirable.

As previously stated, the device may be made in various forms, the essential characteristic being the enclosing wall 6 preferably transparent permitting purchasers to observe the goods readily and tending to confine the cooled air to the display section, the discharge of all cooled air over and about the goods by means of a circulating element, withdrawing the air from the display space about a cooling element to again be discharged over the goods in a continuous circuit.

It will be observed from the foregoing description that the device is comparatively simple and inexpensive in its construction; is efficient in operation in that the cooled air is practically evenly distributed over and about the goods; that the goods are all submitted to air of the same temperature, and that the various objects of the invention are attained by the construction described.

Having thus briefly described my invention, its utility and mode of operation; what I claim and desire to secure by Letters Patent of the United States is—

1. In a counter for the display of goods of a character requiring cooling, a display section permanently open to permit an introduction or removal of goods, means for discharging cooled air into the display section above the goods, a deflector tending to cause movement of the discharged air downwardly towards the goods, means whereby the said cooled air is caused to move practically uniformly in and about the goods, a conduit whereby the air passing about the goods is delivered to the cooled air discharging means, and a cooling element in said conduit.

2. A display counter for goods such as described, comprising a perforate table on or over which the goods are to be positioned, a wall positioned about the periphery of the table extending upwardly therefrom, a deflector member positioned above the table equi-distantly disposed relative to the surrounding wall providing a permanent opening to atmosphere permitting introduction or removal of goods, means for withdrawing air from above the table, and discharging the same upwardly against the deflector, and means for cooling the air previous to its discharge.

3. In a counter for the display of goods requiring to be cooled, a display section comprising a table having a multiplicity of comparatively small apertures distributed approximately uniformly over its surface, a transparent wall about the periphery of the table, supporting means for the table, a deflector member positioned centrally over the table, a chamber beneath the apertured table, means for drawing air from the chamber and discharging the same upwardly against the deflector whereby the said discharged air is initially directed over the goods that may be placed on the table to pass through said apertures, and means for cooling the air previous to its discharge beneath the deflector.

4. In a counter for the display of goods requiring to be cooled, a display section comprising a perforate table, a transparent wall adjacent the periphery of the table, a deflector member extending across the central portion of the table in spaced relation with the peripheral wall, a chamber beneath the perforate table, conduits extending within the said chamber having apertures therein providing communication between the chamber and the conduits, a casing below the chamber to which the conduits are connected, a conduit leading from the casing to beneath the deflector member, means for causing the circulation of air from the display section to the chamber and conduit to discharge beneath the deflector member in a continuous circuit, and means for cooling the air at a point distant from the display section.

5. In a counter for the display of goods requiring to be cooled, a display section comprising a perforate table, supporting means therefor, a transparent wall about the periphery of the table, a deflector member positioned above the table and in approximately equi-distantly spaced relation with the periphery wall, an imperforate plate in spaced relation beneath the perforate table carried by said supporting means, a plurality of apertured conduits in the space between the perforate table and wall, exhaust conduits for the said apertured conduits, a casing beneath the table to which the several exhaust conduits connect at the bottom, a conduit extending from the top of the casing to above the table beneath the deflector, a channel above the table to which the conduit discharges consisting of spaced walls extending longitudinally of the table, the upper edge of the channel being open adjacent the under surface of the deflector, said deflector extending outwardly and downwardly on opposite sides from the channel with the lower depending edges thereof approximately in the same horizontal plane as the upper edge of the peripheral wall and spaced therefrom a sufficient distance to permit access to the goods on the table, means for causing a flow of air in a continuous circuit through the casing and over the goods to pass through the apertures of the table to be returned to the casing, and a cooling means in the casing over and about which the air passes in its circuit.

6. In a counter for the display of goods

required to be cooled, a display section permanently open at the top permitting the introduction or removal of goods, a practically horizontal table having a series of apertures practically uniformly distributed over its surface providing a part of said display section, means for causing cooled air to be discharged above the goods to pass downwardly thereabout and through the apertures in the table, and a wall positioned and adapted to prevent flow of the cooled air horizontally outwardly from the table.

In testimony whereof I sign this specification.

EDWARD M. STRASS.