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(54) A refrigerated display counter

(57) A refrigerated display counter of the tank type comprises a display surface (7) and means (10) for the forced circulation of cooled air, with intake means (13a) disposed on one side of the display surface and delivery means (13b) disposed on the opposite side of this surface; the delivery means include a rising duct (23) for distributing a portion of the cooled air-flow above the display surface and deflector means (25) which deflect at least a portion of the cooled air-flow below the display surface, the deflector means being (25) located in the rising duct (23).

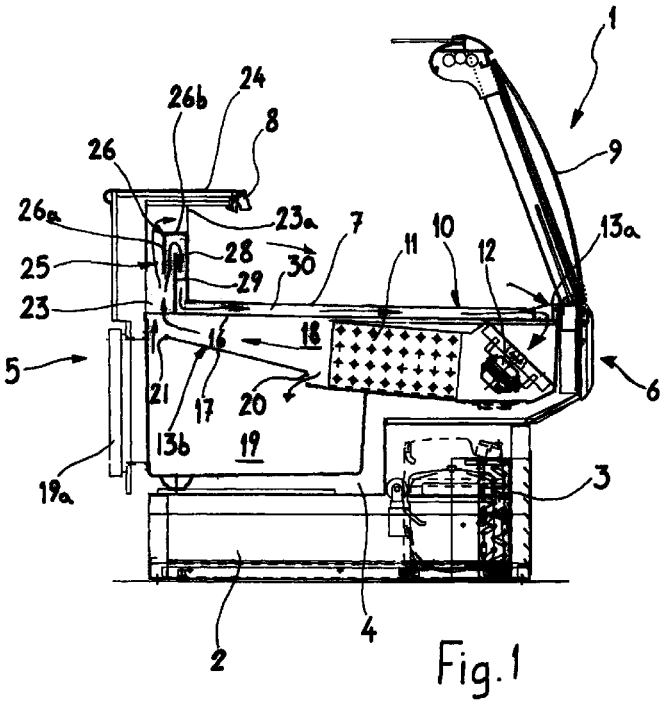

Fig.1

EP 1 029 478 A2

Description

[0001] The present invention relates to a refrigerated display counter of the tank type, according to the preamble to the main claim.

[0002] In the field of display counters of this type, it is known, in order to cool the products displayed for sale, for a forced circulation of cooled air to be directed both over the display surface from above, in order to bring about cooling of the products struck by the cold air-flow, and under the display surface from below, in order to bring about direct cooling of the display surface and of the products displayed in contact with this surface.

[0003] In counters of this type, it is necessary to meter the air-flows accurately so that the cooling of the products from above and from below is correctly balanced. If this is not done, the products may be subjected to excessive drying of the surfaces exposed to the cold air-flow from above or to partial freezing of the surfaces in contact with the display surface. However, this metering is rendered complex by the turbulence which is brought about in the air-flow delivered towards the rising duct of the counter.

[0004] For this reason, the correct positioning and orientation of the deflector means is subject to considerable trial and error and to the experience of the installer of the counter, so that it cannot easily be determined during the construction of the counter in the factory.

[0005] The problem upon which the present invention is based is that of providing a refrigerated display counter which is designed structurally and functionally to optimize the cooling of the products displayed, by the circulation of cooled air above and below the display surface.

[0006] This problem is solved by the invention by a refrigerated display counter formed in accordance with the following claims. The characteristics and advantages of the invention will become clearer from the detailed description of a preferred embodiment thereof, described by way of non-limiting example with reference to the appended drawings, in which Figure 1 shows, in section, a refrigerated display counter formed in accordance with the present invention.

[0007] In the drawing, a refrigerated display counter of the tank type, formed in accordance with the present invention, is generally indicated 1.

[0008] In the counter 1, there is a base 2 containing a motor-condenser unit 3, above which there is a substantially tank-shaped insulated structure 4. A shopkeeper side 5 and a customer side 6 are identified in the counter 1. A display surface 7 defined inside the display counter 1 is accessible from the shopkeeper side through an opening 8 but is protected on the customer side by a glass structure 9.

[0009] Cooled-air circulation means, generally indicated 10 and including an evaporator 11 and an electric fan 12, are disposed beneath the display surface 7.

[0010] Means, constituted by a grid 13a extending along the side of the display surface adjacent the glass 9 for taking in cooled air from the display surface, and means, generally indicated 13b, for delivering cooled air to the display surface, are identified.

[0011] The delivery means 13b are delimited by a wall 16 which extends beneath the display surface in a position spaced from a further wall 17 which, together with the wall 16, defines a delivery duct 18 downstream of the evaporator 11. The second wall 17 also delimits a chamber 19 for preserving products, which is accessible through a door 19a from the shopkeeper side and which is in communication with the cooled air-flow circulating in the delivery duct 18 by means of respective openings 20, 21. The first of these openings constitute deflector means for tapping off a fraction of the cooled air-flow to cool the products preserved in the chamber 19.

[0012] The delivery duct 18 opens into a rising duct 23 disposed close to the shopkeeper side, oriented substantially vertically relative to the display surface 7, and having an upper opening 23a disposed beneath a shelf 24, in order to distribute a portion of the cooled air-flow circulating in the delivery duct above the display surface 7 so as to cool the products displayed.

[0013] Deflector means are disposed in the rising duct 23 to deflect the remaining portion of the cooled air-flow under the display surface so as to cool the products displayed, by contact.

[0014] These deflector means, generally indicated 25, are located in an intermediate portion of the rising duct 23 in which the cooled-air flow-rate is known and is substantially constant. It is thus possible to distribute the cooled air-flow above and below the display surface 7 in a known manner which can be determined in the factory.

[0015] The deflector means comprise a plate 26 with a first portion 26a extending in a plane substantially parallel to the direction of the cooled air-flow in the rising duct 23, coinciding with the axis of the duct, and a second portion 26b disposed at right angles to the first and fixed to a wall 28 which delimits the rising duct at the rear of the display surface 7.

[0016] The deflector means 25 also comprise a complementary plate 29 which defines, with the above-mentioned first plate 26, a downward duct in which the flow takes place in the opposite direction to the main flow in the rising duct 23. This downward duct is intended to direct the flow separated by the plate 26 towards a distribution duct 30 extending below the display surface, between the latter and the wall 16 of the delivery duct.

[0017] A fraction of the air circulation downstream of the evaporator is taken off in the first tapping-off and serves for cooling the products preserved in the chamber 19. This fraction of the air-flow is directed back into the delivery duct through the opening 21. As a result of these tappings from and readmissions to the first por-

tion of the delivery duct, there is considerable turbulence in the air-flow downstream of the evaporator.

[0018] This turbulence is attenuated until it disappears in the rising duct 23. For this reason, the air-flow for cooling the display surface from below is withdrawn in an intermediate portion of the rising duct quite close to its top. A fraction of the cooled air-flow is thus directed towards the opening 23a above the products displayed, whilst the remaining portion is directed downwards beneath the display surface through the distribution duct 30. The entire air-flow is then collected by the intake means 13a in order to be subjected to further cooling and to the forced circulation brought about by the electric fan 12. The invention thus solves the problem set and achieves many advantages in comparison with conventional counters. In particular, it prevents poor regulation of the distribution of the air-flows which may damage the products displayed, and it avoids the need for the presence of skilled personnel to adjust the deflectors which serve to distribute the forced cooled-air circulation when the counter is installed.

Claims

1. A refrigerated display counter of the tank type having a display surface (7) and means (10) for the forced circulation of cooled air, including intake means (13a) on one side of the display surface (7) and delivery means (13b) on the opposite of the display surface, the delivery means including a rising duct (23) for distributing a portion of the cooled air-flow above the display surface (7) and deflector means (25) for deflecting at least a portion of the cooled air-flow below the display surface, characterized in that the deflector means (25) are located in the rising duct(23).

2. A display counter according to Claim 1, in which the deflector means (25) are located in a substantially intermediate portion of the rising duct (23), the flow-rate of the cooled air-flow in the said portion being known and substantially constant.

3. A display counter according to Claim 1 or Claim 2, in which the deflector means (25) comprise a plate (26) at least a portion (26a) of which extends in a plane substantially parallel to the direction of the cooled air-flow.

4. A display counter according to one or more of the preceding claims, in which the deflector means (25) include a complementary plate (29) defining, with the plate (26) and the rising duct (23), a duct for directing the flow separated by the plate (26) towards a distribution duct (30) extending below the display surface (7).

5. A display counter according to one or more of the preceding claims, in which the delivery means comprise second deflector means (20) for tapping off a fraction of the cooled air-flow and directing it to a preserving chamber (19) of the counter.

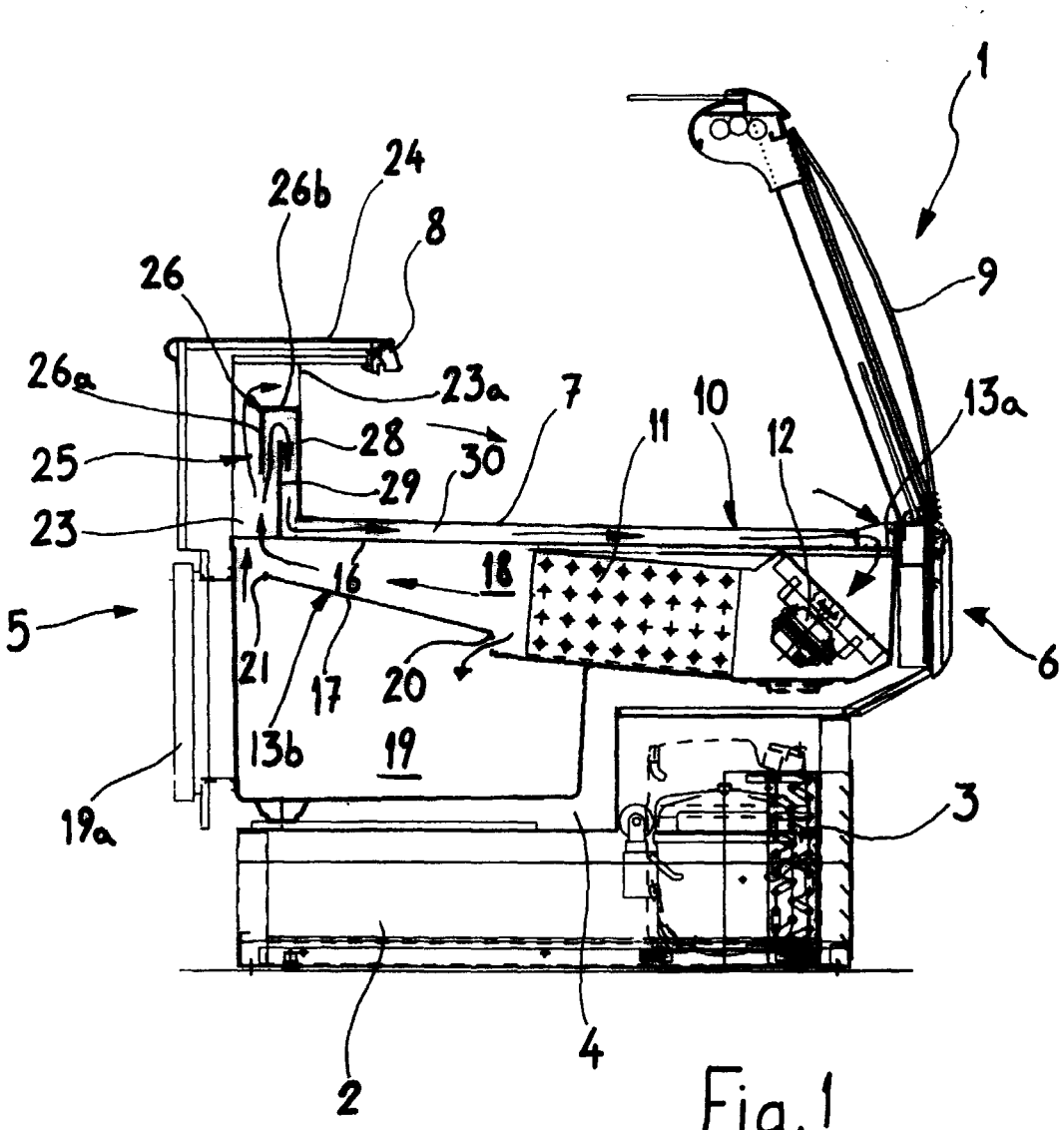
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Fig.1