(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 161 897 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
10.03.2004 Bulletin 2004/11

(51) Int Cl.[7]: **A47B 37/00**, A47F 9/00

(21) Application number: **01660107.2**

(22) Date of filing: **06.06.2001**

(54) **Restaurant service counter and a method for using same**

Kassentisch für Gaststätte und ein Verfahren für seine Verwendung

Guichet pour restaurants et un procédé pour son utilisation

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR
Designated Extension States:
LT LV RO SI

(30) Priority: **06.06.2000 FI 20000234 U**

(43) Date of publication of application:
12.12.2001 Bulletin 2001/50

(73) Proprietor: **Finnfuture OY**
40270 Palokka (FI)

(72) Inventor: **Rautiainen, Taavi**
41330 Vihtavuori (FI)

(74) Representative: **Hakola, Unto Tapani**
Tampereen Patenttitoimisto Oy,
Hermiankatu 12B
33720 Tampere (FI)

(56) References cited:
WO-A-85/04240
US-A- 2 572 120
US-A- 5 417 433
GB-A- 2 180 054
US-A- 3 893 457

Note: Within nine months from the publication of the mention of the grant of the European patent, any person may give notice to the European Patent Office of opposition to the European patent granted. Notice of opposition shall be filed in a written reasoned statement. It shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 161 897 B1

Description

[0001] The invention relates to a restaurant service counter, such as a bar counter. The invention also relates to a method in connection with a restaurant service counter.

[0002] For a long time, attempts have been made to restrict smoking in restaurant facilities by means of legislation by referring e.g. to the exposure of the staff in the restaurant to tobacco smoke. For example in Finland, the law on tobacco nowadays forbids smoking at bar counters.

[0003] Solutions for solving the problems caused by tobacco smoke in restaurant facilities are disclosed for example in the US patent 5441279, in which a casino table contains a filter which filters the air sucked from the customers' side and blows it up on the worker's side. Similar type of circulation is disclosed in the GB application publication 2180054, in which on the customer's side of the counter an air curtain is blown upwards with the purpose of isolating tobacco smoke from the person working behind the table, and the air that is blown upwards is collected and filtered to be blown again. A problem in the latter solution is the unpleasant feeling of draught on the customer's side, in addition to which a common problem occurring in the circulation of air is that despite of the filter, smoke-laden air may be released in the air blast (e.g. if the filter functions in reduced capacity/is out of order), and problems are, at any rate, caused by the need for maintenance resulting from the heavy loading.

[0004] It is an aim of the invention to eliminate the aforementioned drawbacks. To attain this purpose, the invention is set out in independent claim 1.

[0005] In this invention an air nozzle is arranged on the staff's side of the counter in particular, wherein the customer does not experience a feeling of draught. Fresh air that will be blown upwards is taken from the free smokeless air space of the restaurant, for example under the counter. An exhaust duct is connected to the air-discharge system of the restaurant. The blast air is capable of taking along secondary air both from the staff's side and from the customers' side.

[0006] The air nozzle is directed diagonally above the counter. Thus, the air blast takes place in an area where it cannot be noticed easily.

[0007] The method according to the invention, in turn, is primarily characterized in what will be presented in the characterizing part of the appended claim 8. An air curtain of is blown upwards from the rear edge of the counter, directed diagonally forward, and it is extracted by means of local exhaust ventilation as exhaust air. When the clean air of the room is used as fresh blast air and the air blown upwards is extracted with the exhaust air of the room, problems of closed circulation of air do not occur. When the blast exits from the rear edge of the counter, the above-described advantages are attained.

[0008] In the following, the invention will be described in more detail with reference to the appended drawing, in which

Fig. 1 shows a side-view of the apparatus,
Fig. 2 shows a rear view of the apparatus, and
Fig. 3 shows the nozzle on a larger scale.

[0009] On the rear edge of a restaurant service counter 1, such as a bar counter, an air duct is arranged in parallel with the edge, one side of the air duct being equipped with a horizontal air nozzle 2 by means of adjacent nozzle openings. The nozzle structure can also be composed of a continuous longitudinal nozzle opening (nozzle slot) or adjacent slots. The nozzle structure is attained by perforating the wall of the pipe forming the air duct with a suitable spacing in such a manner that when the holes are formed, collars extending outwards are produced therein. The air nozzle 2 (openings) are directed in such a manner that air is directed diagonally upwards towards the front edge (arrow P). Thus, the air current is primarily directed to an area not attended, and the customers and workers do not experience the feeling of draught. The air duct is partly built in below the table level so that only the wall containing the nozzle is visible therefrom, and thus it can be made to look like an elevated rear edge of the counter. In Fig. 1 the wall of the air duct in which the nozzle is located is arranged in an inclined position rising from the plane of the counter 1. The air duct in the wall of which the opening/openings are located, is a pipe-like structure located against the rear edge of the table top of the restaurant service counter and shown in cross-section on a larger scale in Fig. 3.

[0010] The produced air curtain is directed towards the upper bracket, i.e. a shelf 4, located above the table level of the counter 1, and the air current and the smoke entrained therein, coming from the customer's side with the secondary air (arrow S1) ends up in a horizontal exhaust duct 3 extending on top of the shelf 4 and located closer to the customer's side, i.e. the front side, when seen from the rear edge of the counter. The exhaust duct 3 can contain a sufficient amount of discharge openings, i.e. the discharge openings form a local exhaust ventilation area substantially parallel to the air curtain. The exhaust duct 3 is connected to the air discharge system of the restaurant, i.e. it can lead to the exhaust air unit belonging to the general ventilation of the restaurant. Behind the counter 1, above the working area there is also an inlet 5 of the supply air ducting bringing fresh supply air, i.e. a diffuser of supply air, and secondary air (arrow S2), entrained by the air curtain from the fresh supply air coming from said inlet, enters the exhaust duct 3. When the supply air is brought to the staff's side, it is at the same time possible to ensure the flow of air therefrom to the customers' side, which prevents the access of tobacco smoke to the other direction. Similarly, the air intake point of the air nozzle 2 is located behind the front panel of the counter, i.e. it is isolated from the

customer premises and at the same time located on the inlet side of fresh air. Thus, the air intake of the nozzle and the air exhaust of the nozzle are connected to the general ventilation system of the restaurant room, the air intake to the supply air of this general ventilation and the exhaust to the exhaust air of the general ventilation, and a closed circulation is not necessary. The blast air intake point for the nozzle is also clearly separated from the area (customers' side) in which the emission (especially tobacco smoke) is produced that is to be isolated and extracted by the air curtain P.

[0011] Fig. 1 also shows the alternative that the exhaust duct 3 is brought to the blasting area of the nozzle from the ceiling, for example as a pipe branching from an exhaust air duct belonging to the general ventilation of the room and located on the ceiling. The air intake point is located in the blasting area of the nozzle, towards the customers' side from the rear edge of the counter. Thus, the air coming from the air nozzle 2 and the secondary air entrained therein are discharged as local exhaust ventilation in this alternative as well. In this alternative, there may also be several intake points distributed over the width of the counter, as in the horizontal exhaust duct extending parallel to the counter.

[0012] Fig. 2 shows the location and air intake of the air nozzle 2 when seen from behind the counter. In the middle of the horizontal air duct located at the rear edge of the counter, an inlet duct 6 of blast air is coupled, said inlet duct containing a control damper 7 and possibly a filter in its intake end. The inlet duct 6 contains a blower 8 (for example with a thyristor control) and on both sides of the same silencers, i.e. sound traps 9. The intake end can also be located elsewhere than underneath the counter and behind the front panel of the same, in such a point, however, that it is connected to the fresh air coming from the general ventilation of the room.

[0013] Hereinabove, the concept of air curtain refers either to a curtain extending continuously in the lateral direction of the counter, or to several adjacent air cones (coming from separate nozzle openings) together producing an isolating and secondary air guiding effect similar to that produced by an air curtain.

Claims

1. A restaurant service counter (1) such as a bar counter in a room having a staff's side and a customer's side containing an air duct comprising an air nozzle unit (2) constituted by one or more nozzle openings directed upwards to produce an air curtain (P) within a particular width, **characterized in that** the air nozzle unit (2) is positioned on the rear edge of the counter (1) on the staff's side and the air intake of the airduct is connected to fresh air and **in that** the nozzle opening/openings of the air nozzle unit (2) is/are disposed at an acute angle relative to the table top of the counter (1) such that, in use, air emitted from the nozzle(s) is directed diagonally across the counter's table top and upwards towards the room's ceiling.

2. The restaurant service counter according to claim 1, **characterized in that** in use in the room in which the counter (1) is disposed there is an exhaust duct (3) in the blasting area of the nozzle.

3. The restaurant service counter according to claim 2, **characterized in that** the exhaust duct (3) is positioned on top of a shelf (4) located above the uppermost level of the counter (1).

4. The restaurant service counter according to claim 2, **characterized in that** the exhaust duct (3) is fixed to the ceiling of said room.

5. The restaurant service counter according to any of the preceding claims, **characterized in that** the air nozzle unit (2) is formed on one side of a longitudinal horizontal air duct extending parallel to the rear edge of the counter (1).

6. The restaurant service counter according to claim 5, **characterized in that** the air duct of the air nozzle (2) unit that contains the nozzle opening/openings in its wall, is at least partly built in below the level of the counter (1).

7. The restaurant service counter according to claim 5, **characterized in that** the nozzle opening/nozzle openings is/are located on the wall of the air duct which forms a border rising above the level of the table top of the count at the rear edge of the counter (1).

8. A method of reducing tobacco smoke pollution in connection with a restaurant service counter (1) such as a bar counter, in a room, said counter (1) having a staff's side and a customer's side, in which method an air curtain (P) is blown upwards within a particular width, by means of which air curtain the travel of air currents and possible tobacco smoke entrained in said air currents from the customers' side to the staff's side of the counter is prevented, **characterized in that** the air curtain (P) is blown from the rear edge of the counter on the staff's side and the air of the air curtain (P) and the secondary air entrained therein is extracted in a local exhaust ventilation system as exhaust air and **in that** the air curtain (P) is directed diagonally from the staff side towards the customer side and upward towards the room's ceiling.

Patentansprüche

1. Servicetisch (1) für Gaststätte wie eine Bartheke in einem Zimmer mit einer Personalseite und einer Kundenseite, der eine Luftleitung hat, die eine von einer oder mehreren nach oben gerichteten Düsenöffnungen bestehende Luftdüseneinheit umfaßt, um einen Luftvorhang von bestimmter Breite zu erzeugen, **dadurch gekennzeichnet, daß** die Luftdüseneinheit (2) an der Rückkante des Tisches (1) auf der Personalseite angeordnet ist und der Lufteintritt der Luftleitung an Frischluft angeschlossen ist, und daß die Düsenöffnung(en) der Luftdüseneinheit (2) unter einem spitzen Winkel im Verhältnis zur Oberfläche des Tisches (1) angeordnet ist/sind, so daß während des Betriebs die aus der Düse(n) strömende Luft schräg über die Oberfläche des Tisches und nach oben in Richtung zur Zimmerdecke gerichtet ist.

2. Servicetisch für Gaststätte nach Anspruch 1, **dadurch gekennzeichnet, daß** während des Betriebs im Zimmer, wo sich der Tisch befindet, eine Abluftleitung (3) im Ausblasbereich der Düse angeordnet ist.

3. Servicetisch für Gaststätte nach Anspruch 2, **dadurch gekennzeichnet, daß** die Abluftleitung (3) auf einem oberhalb des höchsten Niveaus des Tisches (1) befindlichen Regal (4) hingelegt ist.

4. Servicetisch für Gaststätte nach Anspruch 2, **dadurch gekennzeichnet, daß** die Abluftleitung (3) an der Decke des genannten Zimmers befestigt ist.

5. Servicetisch für Gaststätte nach einem der vorgehenden Ansprüche, **dadurch gekennzeichnet, daß** die Luftdüseneinheit (2) auf einer Seite einer länglichen horizontalen, sich parallel zur Rückkante des Tisches (1) erstreckenden Luftleitung gebildet ist.

6. Servicetisch für Gaststätte nach Anspruch 5, **dadurch gekennzeichnet, daß** die Luftleitung der Luftdüseneinheit (2), die die Düsenöffnung(en) in ihrer Wand enthält, zumindest teilweise unterhalb des Niveaus des Tisches (1) eingebaut ist.

7. Servicetisch nach Anspruch 5, **dadurch gekennzeichnet, daß** die Düsenöffnung(en) an der Wand der Luftleitung angeordnet ist/sind, die einen von dem Niveau der Oberfläche des Tisches (1) an der Rückkante des Tisches (1) hervorragenden Rand bildet.

8. Verfahren zur Verminderung von Verunreinigung durch Tabakrauch im Zusammenhang mit einem Servicetisch (1) für Gaststätte wie einer Bartheke, in einem Zimmer, wobei der genannte Tisch (1) eine Personalseite und eine Kundenseite hat, bei welchem Verfahren ein Luftvorhang (P) nach oben auf einer bestimmten Breite geblasen wird, mittels welchen Luftvorhangs das Wandern von Luftströmungen und möglichem Tabakrauch, der in den genannten Luftströmungen mitgerissen ist, von der Kundenseite nach der Personalseite des Tisches verhindert wird, **dadurch gekennzeichnet, daß** der Luftvorhang (P) von der personalseitigen Rückkante des Tisches ausgeblasen wird und die Luft des Luftvorhangs (P) und die in diesem mitgerissene Sekundärluft als Abluft in dem örtlichen Entlüftungssystem entfernt wird, und daß der Luftvorhang (P) schräg aus der Personalseite in Richtung zur Kundenseite und nach oben in Richtung zur Zimmerdecke gerichtet ist.

Revendications

1. Comptoir de service (1) pour restaurants tel qu'un comptoir de bar dans une chambre avec un côté personnel et un côté consommateur, comportant une conduite d'air comportant un ensemble de buses d'air (2) constitué d'une ou plusierus ouvertures de buse orientées vers le haut pour produire un rideau d'air (P) sur une largeur prédéterminée, **caractérisé en ce que** l'ensemble de buses d'air (2) est placé sur le bord arrière du comptoir (1) sur le côté personnel et l'entrée d'air de la conduite d'air est raccordée à l'air frais, et **en ce que** la/les ouverture(s) de buse de l'ensemble de buses d'air (2) est/sont disposée(s) suivant un angle aigu par rapport à la table du comptoir (1) de manière que, lors de la mise en oeuvre, l'air sorti de(s) buse(s) soit orienté de manière inclinée a travers la table du comptoir et vers le haut vers le plafond de la chambre.

2. Comptoir de service pour restaurants selon la revendication 1, **caractérisé en ce que**, lors de la mise en oeuvre dans la chambre où le comptoir (1) est situé, une conduite d'évacuation (3) est prévue dans la zone de soufflage de la buse.

3. Comptoir de service pour restaurants selon la revendication 2, **caractérisé en ce que** la conduite d'évacuation (3) est placée sur un rayon (4) située au-dessus du niveau plus haut du comptoir (1).

4. Comptoir de service pour restaurants selon la revendication 2, **caractérisé en ce que** la conduite d'évacuation (3) est montée sur le plafond de ladite chambre.

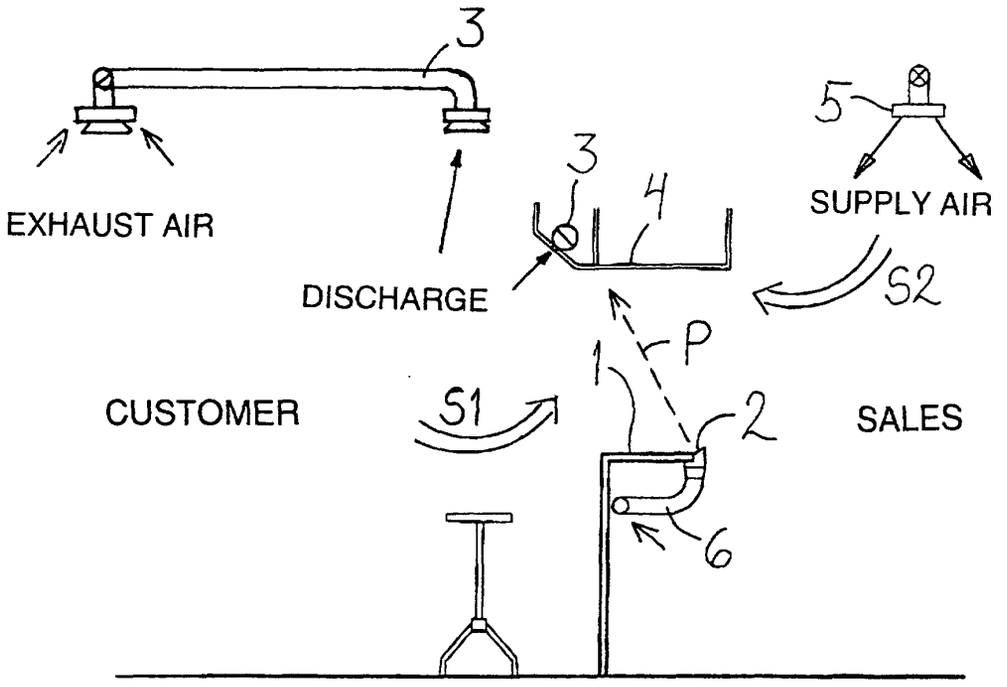
5. Comptoir de service pour restaurants selon l'une quelconque des revendications précédentes, **caractérisé en ce que** l'ensemble de buses d'air (2)

est formé sur un côté d'une conduite d'air longitudinale horizontale s'étendant parallèlement au bord arrière du comptoir (1).

6. Comptoir de service pour restaurants selon la revendication 5, **caractérisé en ce que** la conduite d'air constituant l'ensemble de buses d'air (2) et comportant la/les ouverture(s) de buse dans sa paroi est au moins partiellement construite au dessous du niveau du comptoir.

7. Comptoir de service pour restaurants selon la revendication 5, **caractérisé en ce que** la/les ouverture(s) de buse est/sont situées sur la paroi de la conduite d'air formant un rebord en saillie au dessus du niveau de la table du comptoir (1) sur le bord arrière du comptoir (1).

8. Procédé pour la réduction de pollution par la fumée de tabac associé à un comptoir de service (1) pour restaurants tel qu'un comptoir de bar, dans une chambre, ledit comptoir (1) ayant un côté personnel et un côté consommateur, le procédé dans lequel un rideau d'air (P) est soufflé vers le haut sur une largeur prédéterminée, ledit rideau d'air empêchant le passage des courants d'air et de la possible fumée de tabac entraînée dans lesdits courants du côté consommateur jusqu'au côté personnel, **caractérisé en ce que** le rideau d'air (P) est soufflé à partir du bord arrière du comptoir sur le côté personnel, et l'air contenu dans le rideau d'air (P) et l'air secondaire entraîné dedans est évacué dans un système de ventilation d'évacuation local sous forme de l'air d'évacuation, et **en ce que** le rideau d'air (P) est orienté de manière inclinée à partir du côté personnel vers le côté consommateur est vers le haut vers le plafond de la chambre.



SECTION A – A

Fig.1

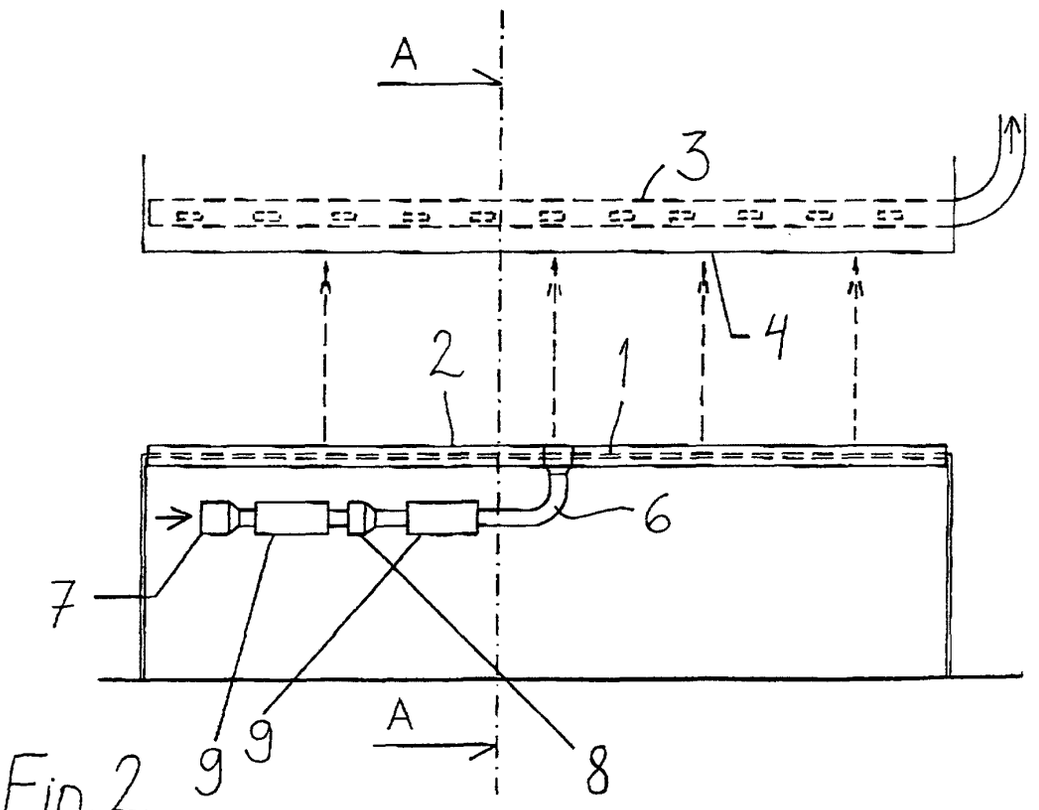


Fig.2

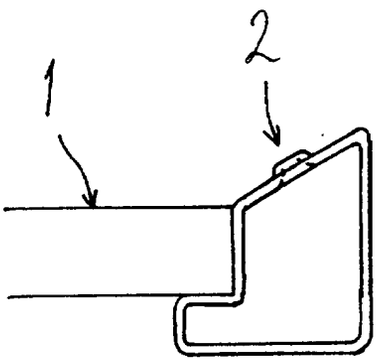


Fig. 3