



APPARATUS FOR CHANNELLING COOKING FUMES

Field of the Invention

The invention relates to an apparatus for channelling cooking fumes, and particularly,
5 though not exclusively, relates to an apparatus for channelling cooking fumes arising
from a stovetop placed in an open area.

Background

Exhaust systems in kitchens typically comprise an extraction hood placed over a
10 stovetop for capturing cooking fumes arising from cooking taking place on the stovetop.
The cooking fumes are expelled to an exterior atmosphere via ducting provided between
the hood and the exterior atmosphere. Where the stovetop is placed in an open area such
as an open-concept modern kitchen in a private home, or the eating area of an eatery for
on-the-spot preparation of customer orders, for example as found in buffet spreads of
15 luxury hotels or restaurants, installation of the extraction hood can pose particular
challenges and difficulties from an engineering as well as an aesthetic standpoint.
Within the open area, which is notably lacking in walls, the extraction hood would still
require some sort of support structures while the ducting would have to run from the
extraction hood to the exterior atmosphere through the open area, creating eyesores that
20 spoil a visual experience of the open area.

Summary of the Invention

According to a first exemplary aspect, there is provided an apparatus for channelling
25 cooking fumes arising from cooking taking place on a stovetop in a designated area, the
apparatus comprising a suction duct having at least one inlet configured for intake of air



containing the cooking fumes, the suction duct configured to channel the air containing the cooking fumes away from the designated area; and a supply duct having at least one outlet configured for outflow of air over at least a portion of the stovetop such that the cooking fumes are at least partially directed by the air towards the at least one inlet of the suction duct; the apparatus being hoodless.

The outflow of air may be configured to form an air curtain over the at least a portion of the stovetop for at least partially preventing passage of the cooking fumes through the air curtain.

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The at least one inlet may be positioned higher than the at least one outlet.

The at least one inlet and the at least one outlet may each comprise one of: a slot and a plurality of holes.

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The suction duct may comprise a hollow tube configured for placement above at least one edge of the stovetop. Alternatively, the suction duct may comprise a hollow wall configured for placement adjacent at least one edge of the stovetop.

20 The suction duct may comprise a plurality of inlets.

The supply duct may comprise a hollow tube configured for placement above an edge of the stovetop. Alternatively, the supply duct may comprise a hollow wall configured for placement adjacent an edge of the stovetop.

The supply duct may comprise a plurality of outlets.

Two of the suction ducts may be provided, each of the two suction ducts configured to
5 be provided at each opposing side edges of the stovetop, and wherein the supply duct is
configured to be provided above and extending over the stovetop between the two
suction ducts, the supply duct having two outlets, each outlet configured to be directed
towards each of the suction ducts.

10 The apparatus may further comprise an upstanding rim curving inwardly towards the
stovetop provided on a top edge of the supply duct and a top edge of the suction duct,
the upstanding rim being configured to help guide the air containing the cooking fumes
towards the inlet.

15 The apparatus may further comprise an air cleaning device into which the air containing
the cooking fumes is to be channelled.

The apparatus may further comprise ducting provided at least partially beneath the
20 designated area configured for channelling the air containing the cooking fumes to the
exterior atmosphere.

The apparatus may be configured to be portable.

Brief Description of the Drawings

In order that the invention may be fully understood and readily put into practical effect there shall now be described by way of non-limitative example only exemplary embodiments of the present invention, the description being with reference to the
5 accompanying illustrative drawings.

In the drawings:

FIG. 1 is a schematic perspective view of a first embodiment of an apparatus for
channelling cooking fumes;

FIG. 2 is a schematic perspective view of a second embodiment of the apparatus for
10 channelling cooking fumes;

FIG. 3 is a schematic perspective view of a third embodiment of the apparatus for
channelling cooking fumes; and

FIG. 4 is a schematic front elevation view of a further embodiment of the apparatus for
channelling cooking fumes.

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Detailed Description of the Exemplary Embodiments

Exemplary embodiments of the apparatus 10 for channelling cooking fumes 50 arising from cooking 102 taking place on a stovetop 100 in a designated area will be described with reference to FIGS. 1 to 4 below. The stovetop 100 may comprise any known
20 heating elements such as gas rings, induction cookers, hot plates, electric rings, barbecues and grills and the like. The designated area may be an eating area of an eatery, an open concept kitchen, an outdoor location such as a yard or terrace, or any other area where it may be desired to locate the stovetop 100.

As shown in FIGS. 1 to 4, the apparatus 10 comprises a suction duct 20 having at least one inlet 22 configured for intake of air (indicated by arrows in dashed lines 24) containing the cooking fumes (indicated by arrows in dot-dashed lines 50, shown only in FIG. 4). The suction duct 20 is configured to channel the air 24 containing the cooking fumes 50 away from the designated area, for example into an air cleaning device 60 (shown only in FIG. 4) or to the exterior atmosphere via ducting passing at least partially beneath the designated area. It should be noted that the apparatus 10 is hoodless, so as to cause minimal physical and visual obstruction to the designated area in which the stovetop 100 is placed. In this way, no unsightly hood or ducting is visibly present in the designated area.

The apparatus 10 also comprises a supply duct 30 having at least one outlet 32 configured for outflow of air (indicated by arrows in dotted lines 34) over at least a portion of the stovetop 100 such that the cooking fumes 50 are at least partially directed by the air 34 towards the inlet 22 of the suction duct 20.

Preferably, outflow of air 34 is configured to also form an air curtain over the at least a portion of the stovetop 100, so that the cooking fumes 50 are at least partially prevented from passing through the air curtain. The objective is to confine the cooking fumes 50 within a volume bound by the outflow of air 34 and the suction duct 20. Accordingly, the inlet 22 may be positioned higher than the outlet 32, so that more of the cooking fumes 50 and heated air that naturally rise will be drawn into the inlet 22

Intake of air 24 into the suction duct 20 may be effected by appropriate means, for

example, a fan provided in the suction duct 20 to draw air 24 into the suction duct 20 through the inlet 22 and blow the drawn air 24 through the fan into the air cleaning device 60 or the exterior atmosphere. The air cleaning device 60 may be of any suitable kind having operating and cleaning characteristics appropriate for the open space. The
5 air cleaning device 60 is preferable configured for placement below the stovetop 100 to minimize ducting running through the open area. Air that has been cleaned by the air cleaning device 60 may be channelled back to the supply duct 30 to be recycled as the outflow of air 34 over the stovetop 100. Alternatively, outflow of air 34 may be effected by other means such as another fan provided in the supply duct 30 that draws ambient
10 air into the supply duct 30 and blows the ambient air out through the outlet 32.

As shown in FIGS. 1 to 3, the at least one inlet 24 is in the form of a slot in the suction duct 20. In alternative embodiments, the inlet 24 may comprise a plurality of holes in the suction duct 20, or openings having any other shapes. Similarly, the outlet 34 is
15 depicted in the form of a slot in the supply duct 30 in FIGS. 1 to 3, but in alternative embodiments, may comprise a plurality of holes in the supply duct 30.

In a first embodiment as shown in FIG. 1, the suction duct 20 comprises an L-shaped hollow tube preferably having a rectangular cross-section. The suction duct 20 is
20 configured for placement above two adjacent edges 110, 120 of the stovetop 100, a side edge 110 and a back edge 120. Similarly, the supply duct 30 comprises a hollow tube preferably having a rectangular cross-section. The supply duct 30 is configured for placement above an edge 130 of the stovetop 100, such as the side edge 130 opposing the side edge 110 where the suction duct 20 is placed, as shown in FIG. 1. The suction

duct 20 and supply duct 30 together form a simple U-shaped structure above and around the stovetop 100, providing a streamlined look while channelling cooking fumes 50 into the air cleaning device 60 to prevent the cooking fumes 50 from pervading the open space where the stovetop 100 is in use. Alternatively, the suction duct 20 may be
5 configured for placement above only one edge 110 of the stovetop 100, preferably the side edge 110.

In a second embodiment as shown in FIG. 2, the suction duct 20 and the supply duct 30 comprise hollow walls extending upwardly from the edges 110, 120 130 of the stovetop
10 100. The supply duct 30 is preferably adjacent the side edge 130 of the stovetop while the suction duct 20 is L-shaped and adjacent the side and back edges 110, 120 of the stovetop 100. Alternatively, the suction duct 20 may be adjacent only the side edge 110 of the stovetop 100. The suction duct 20 preferably comprises a plurality of the inlets 22 in the form of substantially horizontally disposed slots located at different heights on the
15 hollow walls of the suction duct 20, although in other embodiments only one inlet 22 may be provided.

In a third embodiment as shown in FIG. 3, the supply duct 30 is configured for placement above and extending over the stovetop 100 between two suction ducts 20
20 provided on either side 110, 130 of the stovetop. The supply duct 30 is preferably placed centrally between the two suction ducts 20 and comprises a hollow tube having a rectangular cross section. The supply duct 30 is provided with at least one outlet 32 on each of two opposing lateral sides of the hollow tube such that each outlet 32 is directed towards each of the suction ducts 20.

As shown in FIG. 4, the apparatus 10 may comprise an upstanding rim 40 that curves inwardly towards the stovetop 100 provided on a top edge 28 of the supply duct 20 and a top edge 28 of the suction duct 30. The upstanding rim 40 is configured to help guide the air 24 containing the cooking fumes 50 towards the inlet 22 and also enhance the air curtain effect provided by the outflow of air 34.

Preferably, the apparatus 10 is configured to be portable, so that it may be easily transported to and placed in any designated area where the stovetop 100 is to be used. In this way, the apparatus 10 is particularly suited for use in restaurants having cooking stations in open eating areas since its portability allows it to be moved together with portable stovetops 100 so that the layout of the eating area may be readily changed to suit changing usage and/or design requirements. A portable apparatus 10 also has commercial applicability as a consumer product for use with outdoor cooking equipment such as barbecues and grills where provision of extraction hoods will not be feasible. The apparatus 10 may further preferably be configured to be collapsible or retractable so that when not required, the apparatus 10 may be readily stowed away.

Whilst there has been described in the foregoing description exemplary embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations in details of design, construction and/or operation may be made without departing from the present invention. In particular, individual features in the three embodiments described above may be interchanged, separately combined or altered to form further embodiments. For example, while the suction ducts 20 in the third embodiment as shown in FIG. 3 have been described and depicted as hollow walls,

they may alternatively be configured as hollow tubes similar to the hollow tube suction ducts 20 described and depicted in the first embodiment and FIG. 1 respectively. The suction duct 20 as described in the first and second embodiments may be provided corresponding to only one edge of the stovetop 100 instead of as an L-shape
5 corresponding to two edges of the stovetop 100. The hollow tube suction ducts 20 and supply ducts 30 may have any other shaped cross-sections other than the rectangular cross-section described and depicted in the figures; for example, elliptical, circular, semi-circular or triangular cross-sections may be used. Orientation of the at least one inlet 22 and the at least one outlet 32 in the suction and supply ducts 20, 30 respectively
10 may be configured in any other suitable or desired manner other than the substantially horizontal placement shown in the figures. For example, the at least one inlet 22 may be provided as a sloping or wavy slot in a hollow wall suction duct 20, or as a plurality of holes on a wavy line on a hollow tube suction duct 20, so long as both functional and aesthetic requirements are met.

The Claims

1. An apparatus for channelling cooking fumes arising from cooking taking place on a
stovetop in a designated area, the apparatus comprising:
 - 5 a suction duct having at least one inlet configured for intake of air containing the
cooking fumes, the suction duct configured to channel the air containing the cooking
fumes away from the designated area; and
 - a supply duct having at least one outlet configured for outflow of air over at least
a portion of the stovetop such that the cooking fumes are at least partially directed
10 by the air towards the at least one inlet of the suction duct;
 - the apparatus being hoodless.
2. The apparatus of claim 1, wherein the outflow of air is configured to form an air
curtain over the at least a portion of the stovetop for at least partially preventing
15 passage of the cooking fumes through the air curtain.
3. The apparatus of claim 2, wherein the at least one inlet is positioned higher than the
at least one outlet.
- 20 4. The apparatus of any preceding claim, wherein the at least one inlet and the at least
one outlet each comprise one of: a slot and a plurality of holes.
5. The apparatus of any preceding claim, wherein the suction duct comprises a hollow
tube configured for placement above at least one edge of the stovetop.

6. The apparatus of any one of claims 1 to 4, wherein the suction duct comprises a hollow wall configured for placement adjacent at least one edge of the stovetop.
7. The apparatus of any preceding claim, wherein the suction duct comprises a plurality of inlets.
8. The apparatus of any preceding claim, wherein the supply duct comprises a hollow tube configured for placement above an edge of the stovetop.
9. The apparatus of any one of claims 1 to 7, wherein the supply duct comprises a hollow wall configured for placement adjacent an edge of the stovetop.
10. The apparatus of any preceding claim, wherein the supply duct comprises a plurality of outlets.
11. The apparatus of any one of claims 1 to 8, wherein two of the suction ducts are provided, each of the two suction ducts configured to be provided at each opposing side edges of the stovetop, and wherein the supply duct is configured to be provided above and extending over the stovetop between the two suction ducts, the supply duct having two outlets, each outlet configured to be directed towards each of the suction ducts.

12. The apparatus of any preceding claim, further comprising an upstanding rim curving inwardly towards the stovetop provided on a top edge of the supply duct and a top edge of the suction duct, the upstanding rim being configured to help guide the air containing the cooking fumes towards the inlet.

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13. The apparatus of any preceding claim, further comprising an air cleaning device into which the air containing the cooking fumes is to be channelled.

10 14. The apparatus of any preceding claim, further comprising ducting provided at least partially beneath the designated area configured for channelling the air containing the cooking fumes to the exterior atmosphere.

15 15. The apparatus of any preceding claim, wherein the apparatus is configured to be portable.