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(54) SMOKE EXTRACTING SYSTEM FROM KOREAN BARBECUE GRILL

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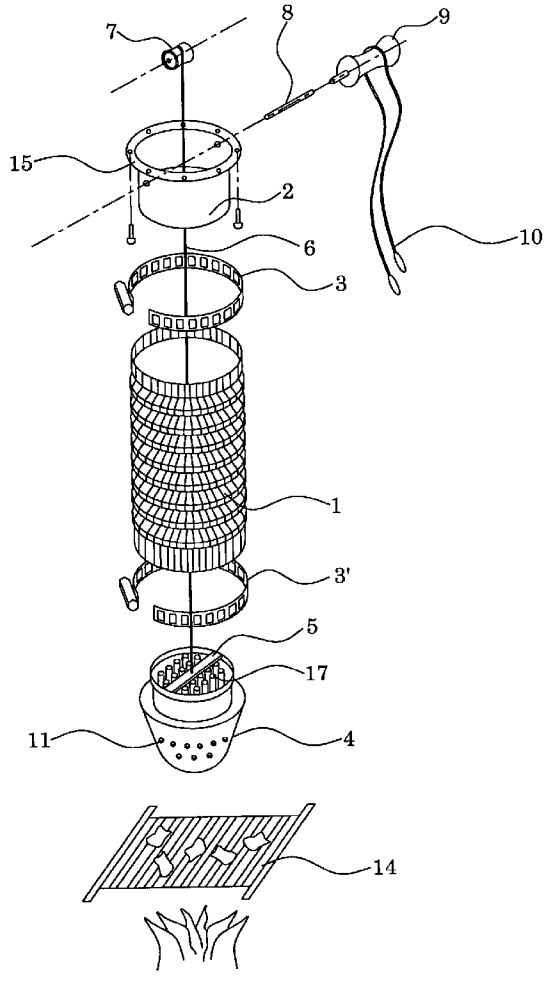
(57) **ABSTRACT**

A novel "Korean Barbecue" smoke extractor is attached to a typical indoor air ventilation system of a "Korean Restaurant". The smoke extractor of this invention is comprised of, including but not limited to, a flexible shrinkable metal pipe of a diameter 6 to 20 cm, an oil collector, a crossing bar, a string for drawing up the crossing bar and the oil collector, and a means for winding and releasing of the string. The oil collector is attached at the bottom end of the metal pipe by a means of, including but not limited to, a screw, a welding, a metal ribbon, a clamp, and a flange. Pluralities of holes are punched along the surfaces for a suction of the smoke and the fumes generated from the grill. The same numbers of metal tubes are soldered to the oil collector holes for connecting the outer surface of the oil collector to the inside of the metal tube. The length of the metal tubes and the concave inner surface of the oil collector hold the oil condensed from the fumes. The upper part of the metal pipe is attached to an air ventilating duct which is installed crossing over the ceiling of a restaurant indoor by means of, including but not limited to, a flange, a metal ribbon, a welding and a screw. The lower bottom of the smoke extractor is located from 5 to 60 cm above the barbecue grill when the metal pipe is fully stretched. The smoke extractor of this invention is flexible to move sideways for collecting smokes from different sites of a grill.



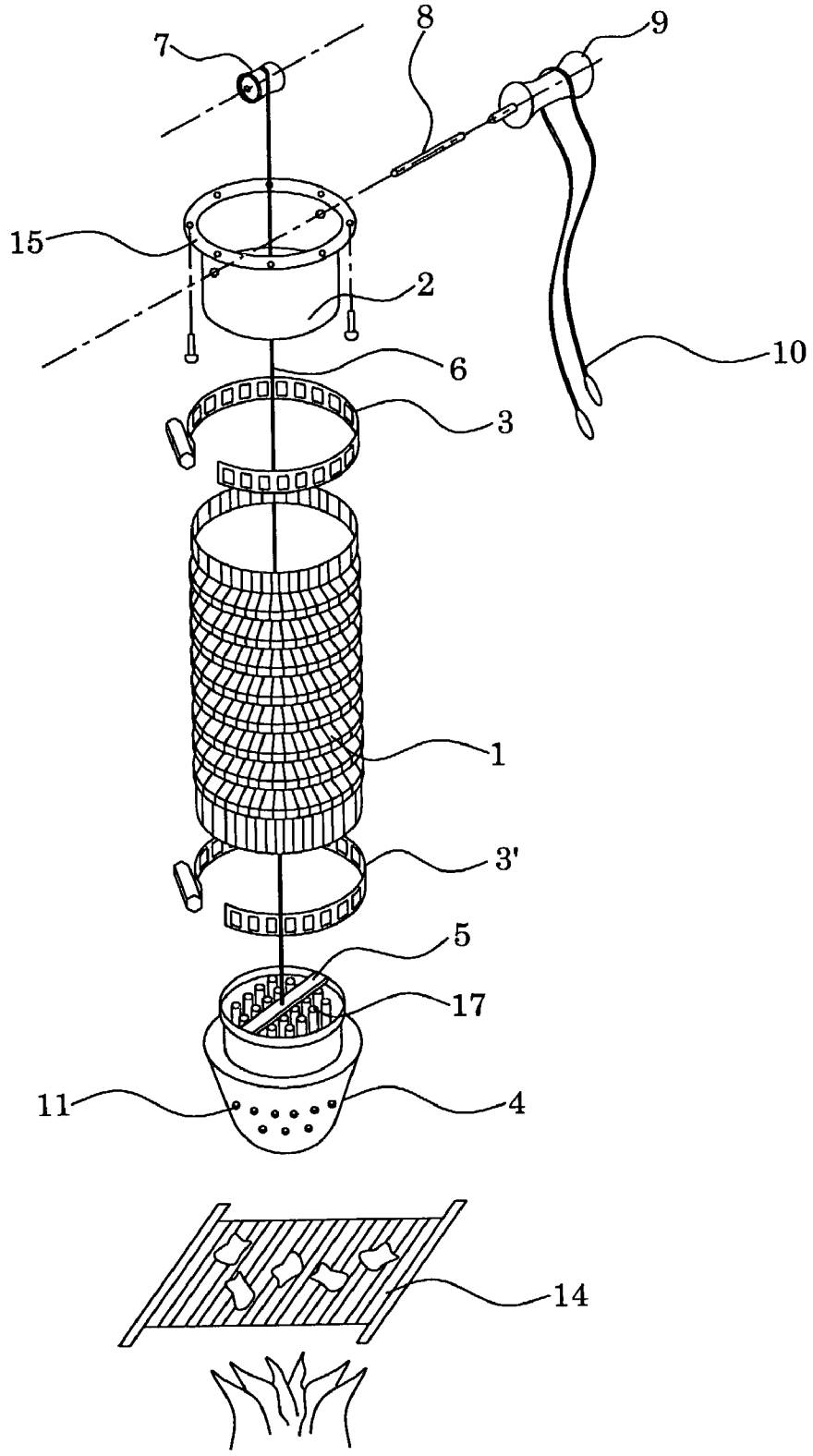


FIG.1

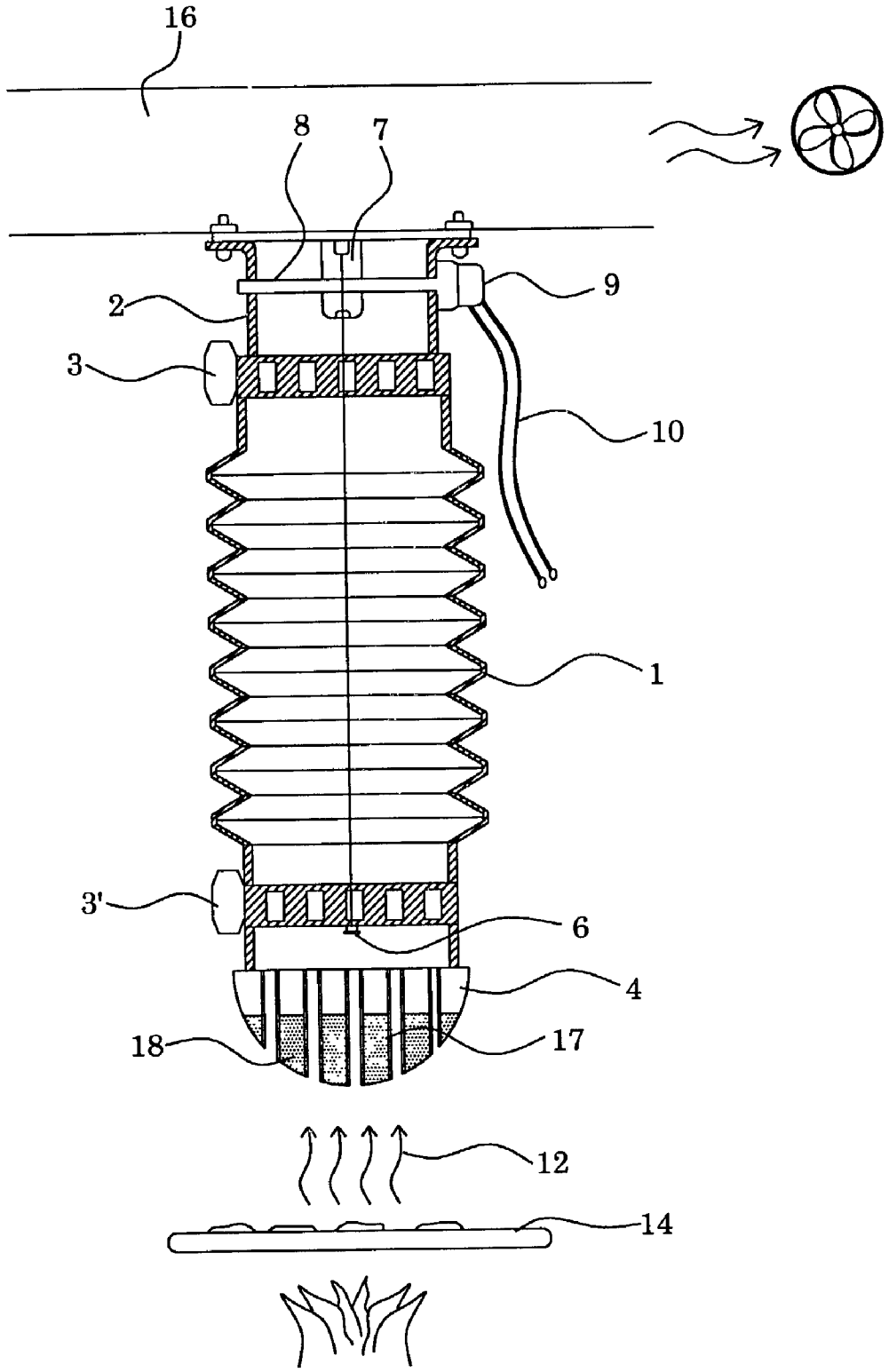


FIG.2

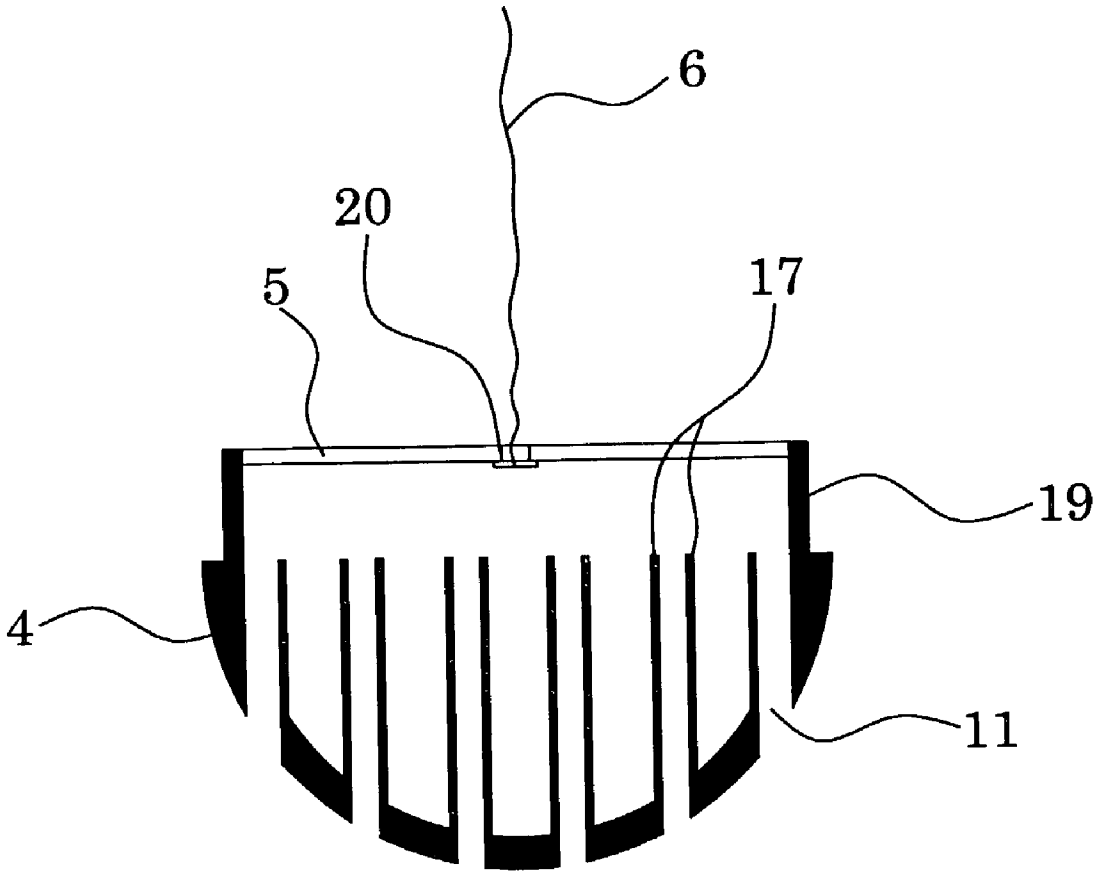


FIG.3

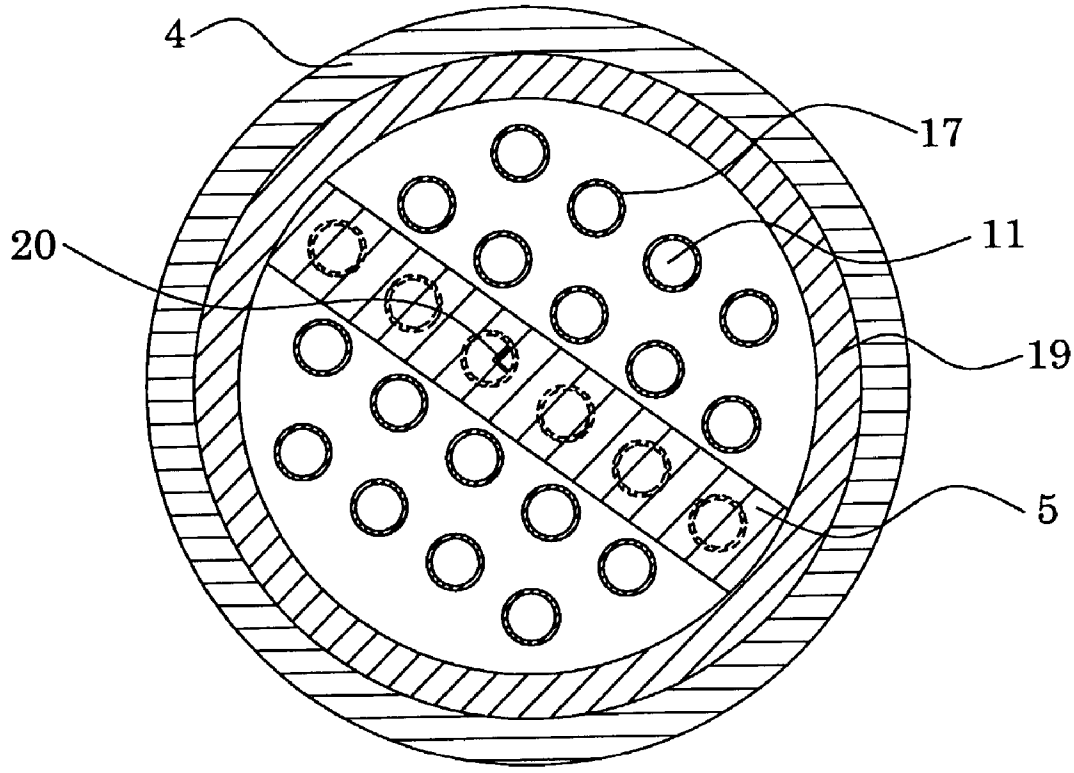


FIG.4

SMOKE EXTRACTING SYSTEM FROM KOREAN BARBECUE GRILL

[0001] The present invention relates to a novel "Korean Barbecue" smoke extractor attached to an air ventilation system of a "Korean Barbecue Restaurant".

BACKGROUND OF THE INVENTION

[0002] Korean barbecue is prepared on an indoor grill over smokeless burning charcoals. The barbecue grill is located at the center of a dining table. People sit around the table and bake raw meats served with sauce on the grill. Smoke and flavor are generated from the meats as the meat is cooked. The taste of the "Korean Barbecue" is favored but the smoke throbbing their eyes and the smell permeating on their cloths for a long time, are disliked. Therefore, it is the purpose of this invention to provide a novel smoke extracting system from an indoor "Korean Barbecue" grill table for a pleasant restaurant atmosphere.

[0003] 1. Field of Invention

[0004] This invention relates to a novel flexible smoke extractor enables to move itself up down and sideways for a collection of smokes from different sites of a grill.

[0005] 2. Description of the Prior Art

[0006] U.S. Pat. No. 6,199,474 to LEE illustrates a smokeless barbecue grill including a tubular frame with a grill received therein and an annular gap defined between the frame and the grill. A plurality of nozzles are located around and below the grill and a divider is located below the nozzles, wherein the divider has a protrusion extending toward the grill with a hole defined there through so that water sprayed from the nozzles containing the grease and ash particles drops through the hole. A ventilator is located below the divider to suck air from the frame. U.S. Pat. No. 4,827,903 to KIM illustrate a table-mounted barbecue cooker having a grill, gas burner or coals, grease pan, smoke collection system and grease collection system including a grease filter. Smoke collecting system is installed within a barbecue-cooking table. Those table-mounted barbecue smoke collectors suck the smoke downward. Smoke ventilation systems of the prior arts are very bulky and expensive to install to every cooking table of a "Korean Restaurant". Moreover, the Korean people doesn't like the taste of meats cooked on the prior arts' "Down ward smoke evacuated barbecue". K.R. Patent Application 85-956 to LEE, K.R. Patent 1987-0001685 to LEE, K.R. Patent 20-0239342 to KIM, and K.R. Patent 20-0265737 illustrate "UP-ward" smoke evacuating system installing over the "Korean Barbecue" grill. The smoke evacuation systems have a shrinkable metal pipe, which has a large, skirt attached to the bottom of the metal pipe. The role of the skirt is to collect smoke from broad area. However, 10 to 50 smoke evacuation systems are connected to one large blower. 1) The large radius of the skirt reduces the suction velocity of the smoke lower. Therefore, most of smoke out side of the skirt escapes from the skirt floated by the circulating indoor air and throbbing the peoples' eyes. Extremely high-powered blower is needed for sucking all the smoke from every grill. 2) Another drawback of the prior art is that the large skirt shades the face of the people in front. This is undesirable for the people who want to talk over the meal. 3) The third drawback of the prior art is that the grease entrained with the smoke condensates at the inner-surface of the skirt and drops to the grill to make flame.

[0007] U.S. Pat. No. 4,038,913 to Earley illustrates a ventilation system for beautician shops to exhaust aerosol hairspray from airspace adjacent to a customer's head during a hairstyling process. This art utilizes the same technology described in the previous Korean patents. The only difference is its application.

[0008] None of the prior art provides smoke extracting system of safe, compact and efficient like this invention.

SUMMARY OF THE INVENTION

[0009] It is the purpose of this invention to provide a novel, compact, safe and efficient smoke extractor attached to an air ventilation system for a "Korean Barbecue Table" in a "Korean Barbecue Restaurant" for a pleasant dining atmosphere. The smoke extractor of this invention is comprised of, including but not limited to, a flexible shrinkable metal pipe of diameter from 6 to 20 cm, an oil collector, a crossing bar, a string for drawing up the crossing bar and the oil collector, a means for winding and releasing the string. The oil collector is attached at the bottom end of the metal pipe by a means of, including but not limited to, a screw, a welding, a metal ribbon, a clamp, and a flange. Pluralities of holes are punched along the surfaces for a suction of smoke and fumes generated from the grill. The same numbers of metal tubes are soldered to the oil collector holes for connecting the outer surface of the oil collector to the inside of the metal tube. The lengths of the metal tubes and the concave inner surfaces of the oil collector hold the oil condensed from the fumes. The upper part of the metal pipe is attached to an air ventilating duct which is installed crossing over the ceiling of a restaurant indoor by means of, including but not limited to, a flange, a metal ribbon, a welding and a screw. The lower bottom of the smoke extractor locates from 5 to 60 cm above the barbecue grill when the metal pipe is fully stretched. The smoke extractor of this invention is flexible to move sideways for collecting smokes from different grill sites.

BRIEF DESCRIPTION OF FIGURES

[0010] **FIG. 1** is a perspective assembly drawing of the smoke extractor of this invention.

[0011] **FIG. 2** is a cross sectional view of the smoke extractor of this invention.

[0012] **FIG. 3** is a cross sectional view of the oil collector of this invention.

[0013] **FIG. 4** is a top view of the oil collector of this invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0014] **FIG. 1** is a perspective assembly drawing of the smoke extractor of this invention. The shrinkable metal sheet pipe **(1)** is consisted of, including but not limited to, aluminum, tin, and non-flammable plastics. The upper part of the metal sheet pipe **(1)** is affixed to a flanged pipe **(2)** via a metal tie ribbon **(3)**. The lower bottom of the metal pipe **(1)** is connected to an oil collector **(4)** via an another metal tie ribbon **(3)**. The oil collector **(4)** is a bowl made of stainless steel and has a crossing bar **(5)** to tie the metal string **(6)**, which connects the oil collector **(4)** and the winding wheel **(7)**. The winding wheel **(7)** is affixed to a shaft **(8)**, which

penetrates the flanged (**15**) pipe (**2**) and affixed to a two directionally rotating means (**9**). The rotating direction is controlled by the strings (**10**). **FIG. 2** is a cross sectional view of the smoke extractor of this invention. Pluralities of holes (**11**) are developed at the surface of the oil collector (**4**), through which the smoke (**12**) from the grill (**14**) is extracted. The same numbers of metal tubes (**17**) are soldered to the holes (**11**). Oils (**18**), condensed from the fume and smoke are collected between the concave inner surface of the oil collector (**4**) and the walls of the metal tubes (**17**).

[**0015**] The flange (**15**) at the top of the metal sheet pipe (**1**) is affixed to a duct (**16**) installed at the ceiling of the restaurant. The extracted smoke from each barbecue grill is collected and vented to outdoor after scrubbing the smoke-containing air through, including but not limited to, a water bed, which is not within the scope of this invention.

[**0016**] **FIG. 3** is an enlarged cross sectional drawing of the oil collector (**4**) of this invention. The oil collector (**4**) is constructed of stainless steel, of thickness from 1 mm to 3 mm to have weight heavy enough to hang straight to the metal sheet pipe (**1**) and to resist against to the upward force developed by the blower in the main duct (**16**) system. Pluralities of holes (**11**) are developed along the surface of the oil collector (**4**). Same numbers of metal tubes (**17**) are soldered vertically to the horizon to the holes (**11**). Upper part of the oil collector (**4**) is grooved (**19**) for engaging a metal ribbon band (**3'**). A crossing bar (**5**) is soldered to the oil collector (**4**) across the diameter. The metal string (**6**) is tied to the center of the crossing bar (**5**) through a pin hole (**20**). Oils (**18**) condensed from the fumes and smokes (**12**) from the grill (**14**) are collected in the concave inner surface of the oil collector (**4**) and the metal tubes (**17**). This novel structure of the oil collector (**4**) enables; 1) prevention of a fire break out by the oil directly dropping to the grill; 2) strong suction force due to a narrow opening of the metal tubes; 3) an easy cleaning of the oil collector.

What is claimed is,

1. A novel means of smoke extracting system attached to an indoor air ventilation system for a "Korean Restaurant" is comprised of a flexible and shrinkable metal pipe, an hemi-sphere shaped oil collector having polarities of holes on the surface and the same number of metal tubes soldered thereon and attached at the bottom end of the metal pipe, a crossing bar soldered across the oil collector, a string for drawing up the crossing bar and the oil collector, a means for winding and releasing the string, a flange and two metal ribbons.

2. The flexible and shrinkable metal pipe, in claim 1, is made of Aluminum.

3. The length of the flexible and shrinkable metal pipe, in claim 1, changes from 30 cm when retracted and to 120 cm when fully stretched.

4. Diameter of the metal pipe, in claim 1, is in the range of 5 to 20 cm.

5. The hemi-sphere oil collector, in claim 1, is made of stainless steel.

6. Diameter of the hemi-sphere oil collector, in claim 1, is in the range of 5 to 20 cm.

7. The number of the holes on the surface of the oil collector, in claim 1, is in the range of 1 to 100.

8. Diameter of the metal tubes soldered to the holes, in claim 1, is in the range of 1 mm to 6 mm.

9. Length of the metal tubes, in claim 1, is in the range of 1 to 20 cm.

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