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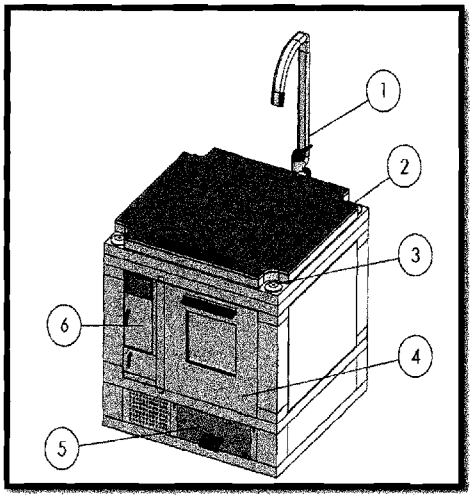
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(54) Title: INTEGRATED SMART, HEALTHY AND SAFE COOKING OVEN (PRESSURE OVEN).



(57) Abstract: This invention relates to smart, integrated, fully automated cooking and pressure oven. The oven works by electricity and comprises a pressure steam box, System of multi-layers works like a puzzle. In addition, it contains touch pad, processing unit operated by software, high temperature, high humidity, cooling systems, hot water, unique hot air and water mixing system. It cooks different foods at the same time in different drawers each drawer works as a cooking cabinet. Controlled systems according to the cooking recipe taking from the oven database, depends on the input cooking data. The invention is a multi- functional cooking oven, which can calculate nutrition and can cook all types of food in a healthy manner taken in consideration medical concerns. The oven is totally safe, secure and clean all the time during cooking processes. The invention also is characterized by ease components installation, supported with internet port and communication devices. The enclosed software can detect and inform the parts failures. It informs maintenance by mobile application for repairing. The oven software automatically manages, adjusts the cooking and safety systems through different sensors and valves. The cooking system is completely protected and automatically monitored all the time.

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INTEGRATED SMART, HEALTHY AND SAFE COOKING OVEN (PRESSURE OVEN).

Technical Field :

Pressure oven for cooking in a healthy manner with nutrition facts by its own recipe and cooking technique.

Background Art :

The previous design of ovens:

Started by using coal or chops of wood, then they used stove with gas with the updates they used electricity. By the technology; microwave, convection ovens and combi steamer are invented with a high tech control.

The problems in the previous ovens:

- The common problems are the vapor the fat, smoke, humidity into the parts of the sensors and cables in the oven that may cause fire.
- There're a lot of screws in some machines breaks down, it takes a long time for maintenance.
- Convection oven sometimes needs to turn the trey during cooking to get even cooking in all sides of the trey.
- Equipments misuse causing machine defaults that takes a long time to repair.
- The way of cooking of this machines loses the value of nutrition food.
- High cost due to corrosion and damage of some parts in some ovens.
- Unhealthy due to radiation waves for heating (microwave).
- The need for longer cooking time (higher energy consumption) which takes a long time to finish.
- A gas leak may occur, resulting in suffocation and fires.

Disclosure Of The Invention :

New in the invention:

Integrated smart, healthy& safe cooking oven "fully automated pressure oven ".

1- It's a pressure oven; it cooks like a pressure pot.

2- It's designed like a puzzle so it could be dismantled and easy for transport.

3- Cooks for itself through intelligent cooking recipes that contain time, heating temperature, steam with understanding nutrition values of food and its technique such as;

- Food nutrition fact is the chef that has recipe nutrition ingredients from vitamins, fibers and minerals.
- If the lid of the pot is sealed properly so as not to let the vitamins evaporate with the steam.
- Temperature control with time control is pre-calculated in an advance in the software. It controls temperature, steam or fluid as the plant needs in which time and heat using valves, temperature control with the cooking time as each ingredient requires to preserve all vitamins and minerals in food.

4- The oven controls the amount of water required to cook the amount of food, so the oven was invented to cook according to the "Nutrition facts" calculations and medical analysis of person, so the cooker is a tool only with the oven.

5- The method of cooking by steam which is mixing (hot air+hot water) in a ball to provide a steam pressure up to 130°c steam.

6- For bakery: it ferments the bread through humidity control of the steam as the oven vacuums the steam after steaming the bread then switches the heat on automatically to bake the bread. So what really cook are the ingredients requirements of cooking without interfering of human.

7- The safety lock and the vacuum of door are designed to be a pressure oven: the oven door is a vacuum sealed and will not open unless it measures heat and pressure for the safety.

8- It's totally safe, hygienic, insulated and healthy.

9- 304 stainless-steel materials that could stand (heat, expansion, corrosion) and covered with glazed that could stand fats.

10- Reduces time of cooking by 80% so that it saves time and energy compared with other traditional pressure pots.

11- Each part in the oven is designed like drawers so it's easy for maintenance and transport (it's a puzzle).

12- All the oven parts are controlled by the computer which protects them from misuse as hardware and software are connected by embedded system through sensors.

13- It's fully automated system control by the recipe of food as the requirement of the cooking ingredients (flow pressure, temperature, steam or convection+ safety lock on or safety lock release).

This invention is related to high tech machine fully automated controlled by computer with a unique technique of cooking as nutrition facts requires through sensors that really manage the method of cooking as the person wishes. Also a database of all what's eatable in the whole world & recipes of an international cuisine as a database inside the software.

- the steam tubes of the oven wherein the assembly contains:
  - An insulated male tube, an insulated female tube; a ring of the gasket between male and female tubes, an outer lid latch for closing tighten sealed.
- the cables of electricity and sensors which each are running in an insulated duct in the oven base including:

- A male cable with an end of the copper connector, a female cable with an end of the copper connector.

- There's a crosswise Z between the sandwich sides as there's a double sandwich sides, there's an insulator of glass wool between each layer + an insulator of space to maintain pressure and temperature inside the oven.
- The feedback of the computer are sensors (valves, flow meter, temp, pumps, release valves, vacuum sensor through the door pen bypass tubes control), even male and female knobs of cables of electricity when attached together, sensors allow the current flows for maximum safety in the circuits.

1.External components:

In shape A:

It's designed to cook as a pressure pot through its high technique of its body frame welded as parts of sheet metal gathered or components as a puzzle, through a collecting screw bolt acting as a pressure knob part (3).

- The oven contains of external drawer units (water tank drawer part (5)- central control unit part (6)).
- All parts of the oven are designed from stainless-steel 304 materials.
- Cook top part (2) works like a touch pad to see videos+ food ingredients (recipes), it contains 3 or 4 or 5 eyes it depends on the model and the software controls which eye to cook on it the type of food+ the size of pot for the quantity of food.
- There's a holder in the pot to clip on the knob of the shower to release the amount of fluid part (1) that is required for cooking with required temperature by using flow meter to measure quantity of fluid through valves on the tube with temperature control and a heater around the pipe.

2.Internal components:

In Shape B:

- Cooking chamber cooks with steam or heat or both according to required method of cooking; if the user wants to cook poultry in the oven or on the cooktop either ways have either technique, just tell the computer how you want your food in the oven or on the cooktop.
- If in the oven: steam poultry at 120°c until it is cooked, then vacuumed the steam from the oven after that the computer starts to fry either by 130°c steam or 300°F of heat.
- On the cooktop: by socketing the knob shower into the socket of the pot lid then, we take it out of the pot which made of special material of granite that's non sticky and anti-scratch material. After it is boiled with the usage of shower (1\2 a cup of coffee of steamed water) at 120°c :130°c, it releases the fats of the poultry so that using this technique in frying without oil, butter or fats.
- A heater surrounding the fan to get heat up to 300°F & steam unit fan part (1).
  - pressure steam and heat are released by safety valves by calculating pressure converting into weight according to the design of layers of the frame and its design. For the over pressure lifting up weight to release the over pressure of the oven which is safer to use weight than spring part (2).
  - It won't open until it reduces heat in the cabinet and pressure through the pressure relief valve and heat relief valve to guarantee the safety of the user after it finishes cooking. also sensors for cooking by pocking sensor into the food to measure food temp to control cooking and a timer control for cooking time.
- All nutrition facts data are entered in the computer software and in various techniques required as anybody wishes to eat so really who is cooking, the nutrition fact of the food.
- For example:

It's well known that the time of cooking in traditional pressure pots such as these tables;

(Oriental peas and carrots)

Timetable for Cooking or Steaming Fresh or Frozen Vegetables				For 100 Servings, 1/4 Cup Each		
				BOILING		STEAMING
Vegetables (As Purchased)	Fresh or Frozen	Amount to Purchase (Pounds)	Ready to Cook (Pounds)	Amount of Water (Quarts)	Cooking Time After Water Boils (Minutes)	Time at 5 Pounds Pressure (Minutes)
Parsnips, 3" pieces	Fresh	12.3	10.2	4 3/4	20 to 30	15 to 20
Peas and carrots	Frozen	9.2	9.2	1	8 to 10	3 to 5
Peas, green shelled	Fresh Frozen	24.7 9.9	9.4 9.9	2 1	10 to 20 5 to 10	10 to 20 3 to 5

It breaks after 3 minutes steaming; after choosing the method of cooking, if peas and carrots with meat or without, for how many people say 5 persons:

- ❖ Ingredients:
  (500 g peas +250 g carrots+150 g onions+7:10 g black pepper)
- ❖ Preparing: after handily washing vegetables,

o cutting onions into small cubes by a sharp knife so as not to lose nutrient of onions

o cutting carrots

o steam tomatoes in 1.30 minutes at 120°c in a sealed tight pot with a maximum amount of water (2.5 cups) then peeled from the skin, take the seeds out and whisk the tomatoes.

• Put all these ingredients after cutting together in the pot with tomato sauce (add 3 cups of soap if it is with meat +1.5 cup of water) at 120°c in 3 min with a well-sealed pot to preserve all vitamins and minerals.

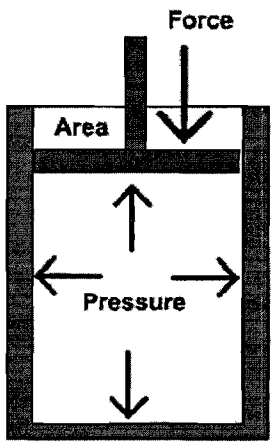
(Meat pressure-cooking instructions are below the time table.)

Meat/Poultry	Approximate Cooking Time (minutes)	Pressure Level
Beef, 1" (25 mm) cubes, 1 1/2 lb (700 g)	10 to 15	High
Beef, dressed, 2 lb (900 g)	10 to 15	High
Beef, steak, rump, round, chuck or blade, 1 to 2" (25 to 50 mm)	20 to 25	High
Beef, stew meat, 1 1/2" (40 mm) cubes	15	High
Chicken, breasts, with bone in, 2 to 3 lb (900 to 1400 g)	8 to 10	High
Chicken, frozen, breasts or thighs, boneless	7 to 10	High

Seafood & Fish	Fresh Cook Time (minutes)	Frozen Cook Time (minutes)
Crab, whole	2 – 3	4 – 5
Fish, whole	4 – 5	5 – 7
Fish, fillet	2 – 3	3 – 4
Fish, steak	3 – 4	4 – 6
Lobster	2 – 3	3 – 4
Mussels	1 – 2	2 – 3

These tables are examples of different designs of pressure pots but these designs are for pots, some of these charts are correct and some are not.

The circulation theory in pressure cooking;



Pressure is in all directions in a fluid

We have to understand the combination of heat temperature and steam to a pressure reaction.

Each of this system of cooking is a unique method of itself, unique because they are found by the experience of the cooking methods to different chefs or households. Now we have to understand that food experience comes from passion and creativity in even designing or serving the outlook of the plate or how our children like their food.

to get an idea how pressure works simply fluid to heat expanding; fluid which works like 4 arrows in the pot horizontally and vertically trying to run away from heat which is mainly in the center. then pressure runs away by returning back to the forest food to cool down by the coolness of the food which goes back to fluid and pressed into the food. that continuous heat that's added to the pot makes that valuable processing inside the pot cooks faster by 80% more than any understanding cooking in the world.

For example:

300 g of beef ,1" in thick from the tenderloin cut without taking the nerve surrounding and the fats away from it; as long as we did not beat the thickness of the meat to flatten it under forest with 8° below zero under low temperature, it depends on the technique it could be cooked in 3 min. the same cut of meat could be cooked in half an hour in an ordinary pan of the grill under low temperature to maintain the natural flavor of food both ways are right to reach the first cut well done in 3 min.

In shape(C):

The ball mixture process;

Ordinary water pipe from the water line fills the water drawer by valve filling about 20 liters in the tank, heated to 80°c then pump sucks 500 ml of hot water per a minute reheated to 110°c measured by flow meter and temperature control entered to the ball with 500 ml at the same time the second tube pressured 500 ml of hot air per a minute at 110°c measured by flow meter and temperature control too. Both tubes

enter the ball in an angle ^35° facing each other and the angle of the cut on the tip of the pipe is ^35 facing each other. Then the mixture (hot water+ hot air) reheated to the required heat temperature followed by (flow meter, temperature control and humidity control), the tube passes in front of a fan into a box that cubes the steam in the cooking chamber of the oven. The over leaded pressure that is not needed in the oven it is released by safety valves that work by weight.

In shape(D):

Other unique features are sensors and electricity; connected like a plug or like a USB, all parts are male and female. When pulling any electric parts, the computer turn-off electricity automatically by the sensor, designed to be steam proof heat resistant and fire proof.

All wires or tubes are designed to be heat resistant, fireproof, steam proof and electrical current proof for the safety of the user.

In shape (E):

- Double shot for the bakery to cool down, through shower built-in in the sealing of the oven part (3).
- 2-led lights that could stand the pressure and heat part (4).
- there's a steam tube in front of a fan that circles the steam inside the oven part (5).
- The drainage of the oven works as a double action: (releases fluid from a steam into a drawer then allows cold air in the oven from the same tube vacuuming from the releasing valves of the steam cabinet and heat cabinet through by bass tube built-in the oven that vacuums heat and steam from the oven in the case of bakery or the case of opening door for safety to open the safety lock of the oven part (6).

In shape (H):

- Oven door equipped with a suction unit for safety, it will not open until after finishing cooking through alarm to indicate the end of cooking then it measures pressure_ heat to open the safety lock.
- if you are in a hurry after cooking, the oven vacuums steam and heat from the cooking chamber by 2 safety valves through an intelligent by bass pipe system with a suction pump to a by bass tube by the ventilation of release pump out of the chimney pipe.
  (the door frame): there is a suction surround the frame between 2 magnetic rubber frames. the safety lock pin of the door when it reaches the entrance of the frame female, it triggers a vacuum that sucks the door.
- the oven door with the glass is designed to resist heat and pressure, the door itself is insulated with a glass fiber between them like a sandwich, the formula of the glass door is 10 mm thick with 2 mm rubber coating surrounding the frame, it is 50 mm in depth a square diameter around the glass.

In shape(I):

Even the tubes of the oven are designed to be dismantled within seconds like a plug of a male and female with a pressure jewans between them with a special design clip; all pipes are designed to maintain temp inside, also the heating system of the pipes are designed in a case acting as a mirror to reflect heat on the pipe with a highly insulated package surrounding with a clip.

3. Operation method:

Once selecting the recipe from the menu stored in the software by having an international cuisine {modern French culinary art, meat dishes, bakery, sweets, cakes, fish and shellfish, vegetables}.

After preparing the required items, the oven will take over and cook by itself.

Also, all the information on nutrition for the food fact and knowledge (according to the person medical condition).

The oven works {as a pressure pot}, it could fry without oil by dry steam.

The oven then sucks air to seal the oven door then turn on the safety lock to prevent anyone from opening the oven door then determine the amount of inputs required (water - heat - steam) depending on the amount of food according to how many people and cooking methods.

The water is then withdrawn from the main water supply to the water tank then heated to about 110 ° C (the water is then raised by a pump to be mixed with hot air into a ball content and the mixture is heated up to 130°c controlled through sensors).

After finishing cooking measured by sensors inside the food and releasing overpressure and heat then the oven door is ready to open.

There is a general electric cable for the oven containing (Stabilizer + fuse) so that it gives full protection of any electrical connection, designed to resist high temp.

All electricity wires are individually distributed inside (duct) so that the wires do not contact each other in a completely safe way and the wires are connected through fuse for 100% protection for the user from the dangers of electricity.

Maximum pressure needed 4 bar and 2 bar for the minimum.

Method of exploitation:

The invention is a smart, healthy and safe electronic cooking oven. All its internal and external operations are managed automatically through a control and processing unit (intelligent and advanced integrated computer). The oven is electric and cooked in a steam pressure manner.

The Brief Description of drawings:

Shape(A)shows external oven components where:
1-water tape
2-electric cooktop

3-collecting screw

4-oven door

5-hot water tank

6-electric keys cabinet

Shape(B)shows internal oven components where:
1-heat fan cabinet
2-safety valve

3-double shot shower

4-led lights

5-steam fan cabinet

6-drainage

- **Shape (C) shows steam process where:**

1-hot water inlet

2-pump

3\13-heater

4\8\14-flow meter sensor

5\7\15-temperature control

6-ball mixture

9-electric copper connector

10-heater coils

11-suction holes

12-hot air unit

16-humidity control

17-mixture (hot water + hot air) outlet

- **Shape (D) shows section of electric connecting cables& sensors where:**

a-female electric connector

b- male electric connector

- **Shape (E) shows double shot valve for bakery where:**

1-fresh water inlet

2-double solenoid valve shot

3-double shot outlet

- **shape (F) shows oven right side where:**
    1- outer metal sheet
    2- press sheet
    3- zz metal support
    4- u-metal frame
    5- press sheet
    6- inner metal sheet
    7- insulator of glass wool
- **shape (G) shows oven detailed column where:**
    1- column
    2- inner cylinder
    3- screw bolt
    4- pressure collecting bolt

- **shape (H) shows oven detailed door\frame where:**

a) Detailed door:

1- fiber glass

2- Safety lock pin

3- Wooden handle

4- Outer insulated layers

5- Hinge position

b) Door frame:

1- Safety lock holes

2- Vacuum holes

3- Magnetic frame

c) Suction door unit:

1- Suction pipes

2- Suction motor

- **shape (I) shows detailed steam pipes where:**

1- female entrance pipe

2- gasket

3- male entrance pipe

4- lid latch toggle

- **Shape (J) shows detailed water tank where:**

1- Outer water tank contains male electric connector

2- Insulator of glass wool

3- Inner water tank

4- Metal block contains female electric connector

- **Shape (K) shows detailed safety valves process where:**

(a) Safety release valves:

1- Heat safety valve

2- Cooking chamber safety valve

3- Intake bypass tube contains solenoid valve

4- Outlet pipe

5- Suction motor

(b) drainage drawer:

1- drainage contains solenoid

2- air compensation slots for the suction

(c)detailed safety valves:

1- outer casing

2-inner casing

3-weight of metal

4-connecting cap

5-intake bypass contains solenoid valve

- **Shape (L) shows cooktop where:**

1-duct for electric cables

2-duct for sensors

3-male electric connector

4-female sensor connector

5-female network connector

6-male sensor USB

7-female electric connector

- **Shape (M) shows heat cabinet unit where:**

1-heat box

2- male electric connector

3-motor

4-hole for safety valve

5-handle

6-heater

7-turbine fan

CLAIMS

1)A pressure cooking oven comprising:

(A)a cabinet of cooking including a plurality of oven components of a base of sheet metal layers, sidewalls (right walls, back walls and left walls) and a ceiling walls connected with each other through 4 columns like a puzzle;

(B)a heating cabinet including a housing and turbine fan surrounding with a heater operating with a motor shaft;

(C)a steam cabinet including a housing and fan with the motor being configured to blow steam from an external steam pipe into a cooking chamber;

(D)a top cooktop being configured to be touch computerized to cook by itself through the recipes nutrition facts as the computer chooses which heater will be used for which particular food and pot size according to food nutrition facts;

(E)a top water tape including hot and cold water configured to be controlled to fill water in pots on cooktop by a special design socket in a pot to be clipped on by this spring shower;

(F)a power supply control cabinet including a screen touch control and electric keys box being configured to control all oven operations;

(G)8 collecting pressure screws configured to be main collecting oven bolts to maintain and tighten joints together by a special pressure and heat rubber;

(H)an oven door assembly being to stand pressure and its frame connected to oven parts like a puzzle;

(I)a bottom water tank being configured to heat water for steam;

(J)a cooktop and oven configured to work by a fingerprint or password or phone control by a voice sound;

(K)a speaker out with multinational in different languages configured to give data to the user of how to choose the recipe ingredients of natural products and how to make the difference of natural food and unnatural within details of nutrition facts in a medical point of view and nutrition facts point of view;

(L)4 columns in the oven corners being configured to attach oven walls with basement and ceiling;

(M) the pressure flow meter surrounded the steam tubes to measure flow inside the tube by a magnetic field to protect heater;

(2) the pressure cooking oven as defined in claim (1);

Assembly walls of oven sides, basement, and ceiling comprising:

1- Outer compressed sandwich of sheet metal layers with glass wool insulator;

2- Inner compressed sandwich of sheet metal layers with glass wool insulator;

3- U frame of sheet metal;

4- 2 crosswise Z shape;

(3) oven walls assemble as defined in claim (2);

1-Each wall layers welded together after setting ZZ shape between the outer and inner sandwich;

2- the tips of ZZ shape are welded surrounding u frame to stand pressure and prevent buckling;

(4) the pressure cooking oven as defined in claim (1);

A heating unit comprising:

1- A cabinet of sheet metal like a drawer;

2- A heater to get 250°:300° F;

3- A motor shaft;

4- A fan with 4 twisted wings;

(5) the drawer of heat unit as defined in claim (4) comprising;

1-an electric side male socket for electricity and sensors taken from side duct containing female electricity and sensors;

2-a hole for the safety valve to vacuum heat from the oven by a vacuum pipe to replace it with room temperature air for safety;

3-a handle configured to pull like a drawer;

(6) the pressure cooking oven as defined in claim (1);

A cooktop further comprising:

1-Sensors for cooking temperature and fluid;

2-a touch control containing recipes nutrition data;

(7) a method of cooking on cooktop further comprising;

1- cooktop software containing a data base of nutrition facts of all international cuisine;

2-cooktop programming configured to choose which eye going to be cooked on according to the type of meal and quantity;

3- configured to choose the pot size for the required recipe;

4-configured to calculate the quantity of fluid from water tape and filled by the user;

1- configured to be a processing end bell controlled by sensors;

(8) the pots in claim (7) configured to be:

a) a shower clips for top water tape;

b) a built-in internal sensor by a digital screen on the pot and being formed to cooktop while cooking process and these pots are designed only for meat and poultry;

(9) a water tape of claim (1) configured to work by waving finger to choose which hot or cold water;

(10) the pressure cooking oven as defined in claim (1), wherein power supply control unit further comprising:

1- a screen touch control like a pad configured to store all oven database;

2- an electric keys box configured to control all oven operation through digital keys;

(11) a screen touch as defined in claim (10), wherein database memory of processing system further comprising;

a) all the international cuisines recipes detailed with nutrition facts in grams;

b) nutritional facts for all food of the whole world such as (meat-poultry-fish-vegetables-fruits-herbs);

c) human body nutritional calculator according to (age-weight-height-medical analysis) such as BMI-BMR-Ideal Weight-Daily calories;

d) method of cooking recipes detailed with ingredients, preparation step by step calculated in grams and time of cooking with temperature;

e) each oven parts are monitored to be controlled by the computer in case of any defaults as computer informs the maintenance of the part number with place through via net or mobile application;

f) automatic software update for any new information about food nutrition or any new recipe from the oven website;

g) override for the user to add anything about food;

(12) the columns of claim (1) configured to attach all oven parts together comprising:

a) an outer column of sheet metal welded with top and bottom plate with a hole for the male and female screw;

b) a tube configured to hold the female screw in its place to be able to turn round without destroying the insulator the tube and the column;

c) a female screw configured to hold the oven puzzle the male screw;

d) a male screw includes a top flange and a screw bolt to gather oven sides and tighten through the space that's designed in the female, as there's an empty gap between the females together for the gaskets to make it into a steam and air tight;

(13) the door as defined in claim (1) further comprising:

a) a door frame, includes a suction unit tubes with a suction motor in the oven base and it's surrounded with gasket containing a magnetic;

b) outer sheet metal layers' assembly, insulated with glass fiber-containing 6 safety lock pins, one of them is a triggered pin shorter than the other 5;

c) an inner sheet metal glass frame;

d) 2 layers of glass;

(14) the water tank drawer in the oven base contains 2 parts:

1)The first part is the water tank comprising;

The main water tank sealed with a fiber glass wherein; a heater keeps the water at 80°c continuously hot and maintains enough water for cooking even for cooktop or oven that's reached up to 20 liters;

Temperature control to measure and control the temperature inside;

A solenoid valve to maintain the required measurement of the water pipe;

2) The second part is the drawer of the oven drainage includes;

A drainage;

A pressure valve control inside the drainage; designed as steam tighten to open or close for 2 reasons, even to suck humidity from the oven or to suck heat and steam through the safety valve by replacing air into the cooking cabinet through holes in the drawer;

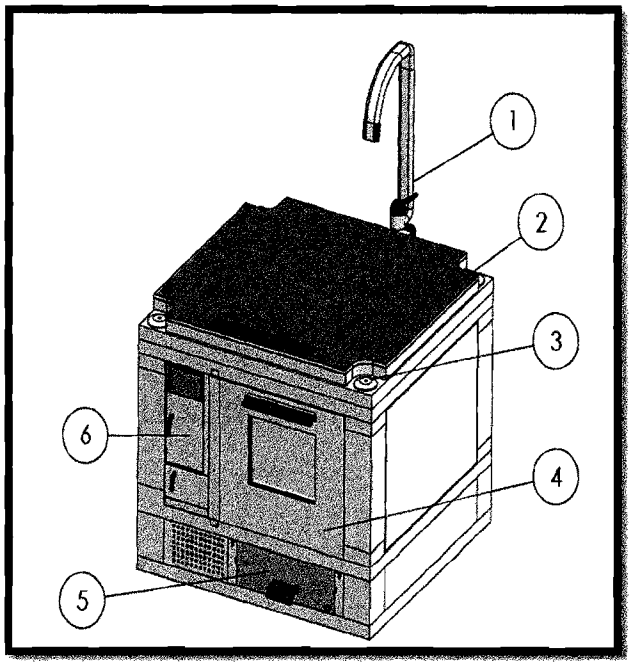
(15) the mixture unit in the oven base includes;

1) 2 inlets of 2 equal pressure-flow hot air and hot water measured before by a flow meter and temperature control;

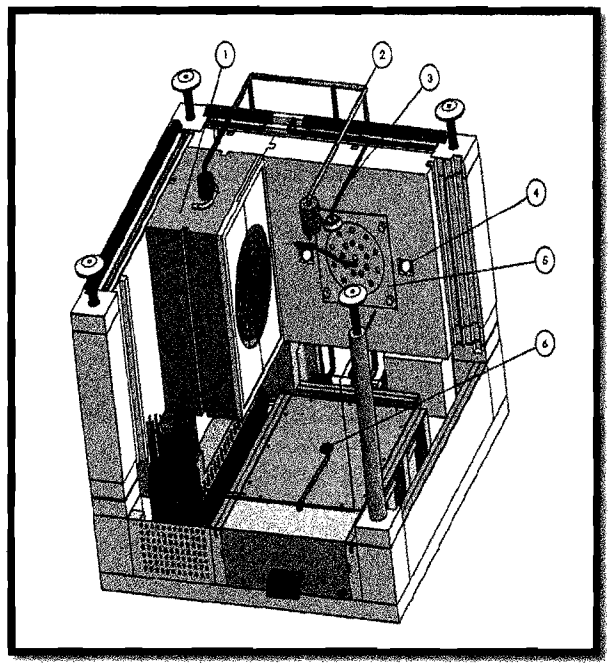
2) outlet of mixture taken into a heater, sensor flow meter, temperature control, and humidity control;

the pressure flow meter surrounded the steam tubes to measure flow inside the tube by a magnetic field to protect heater;

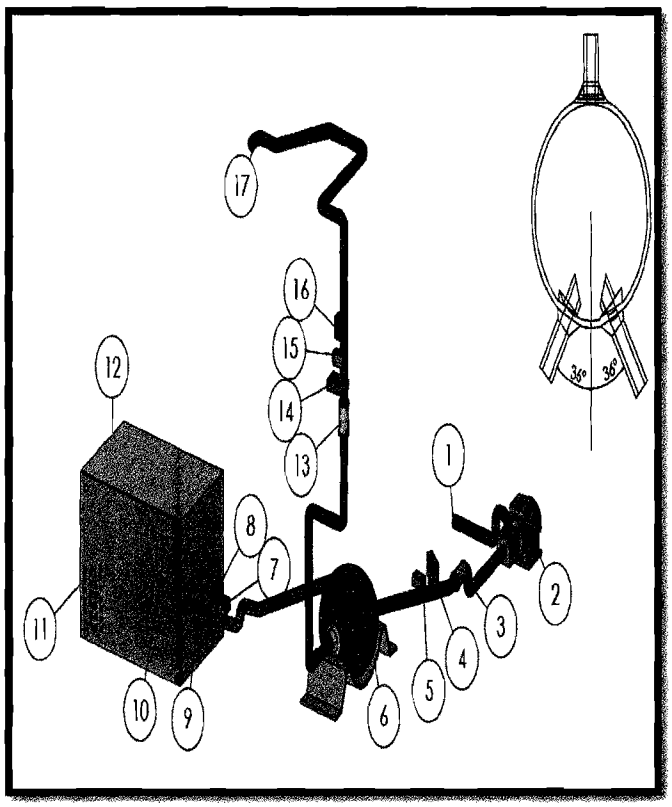
Shape (A)



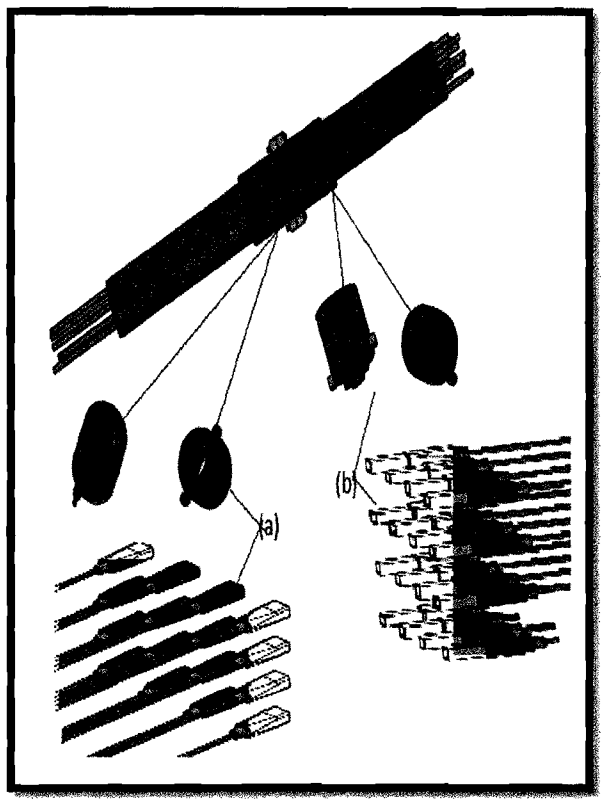
Shape (B)



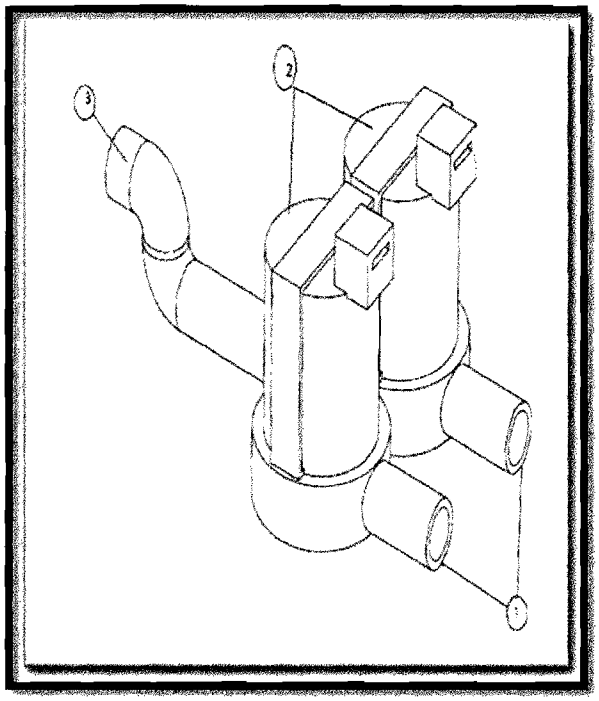
Shape (C)



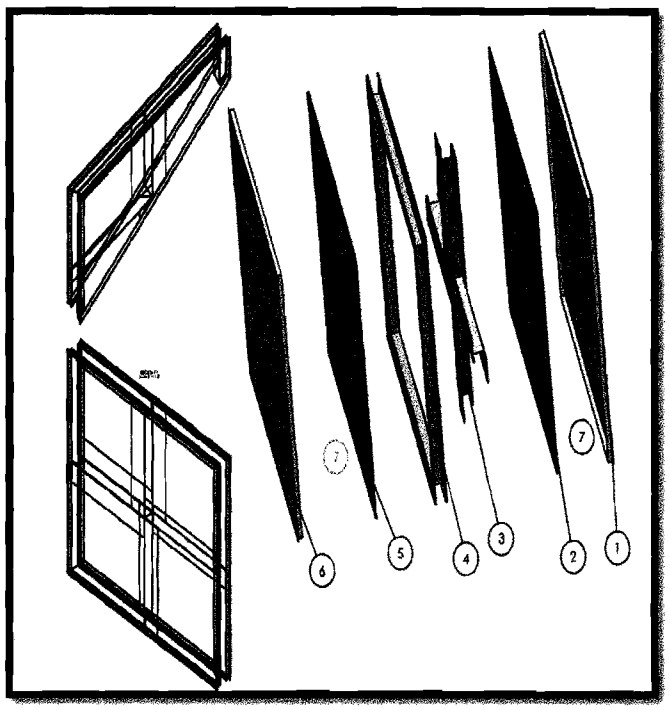
Shape (D)



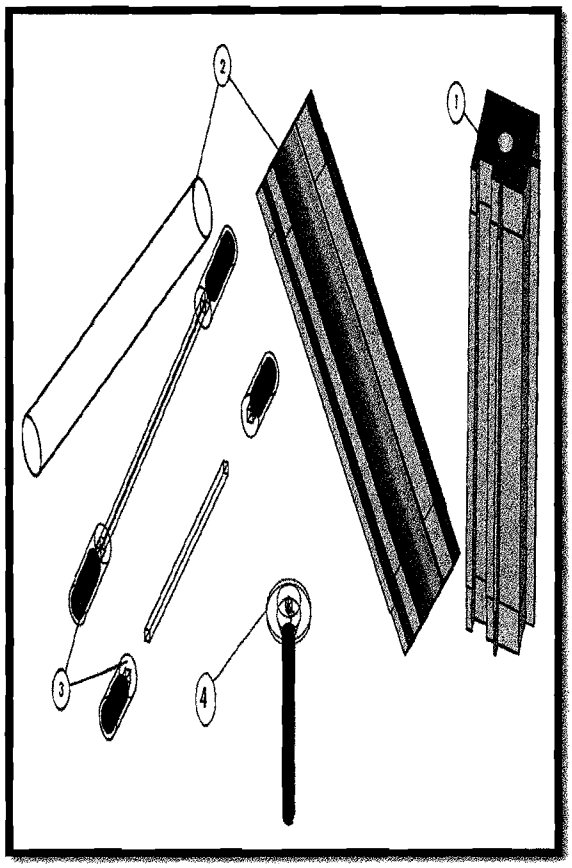
Shape(E)



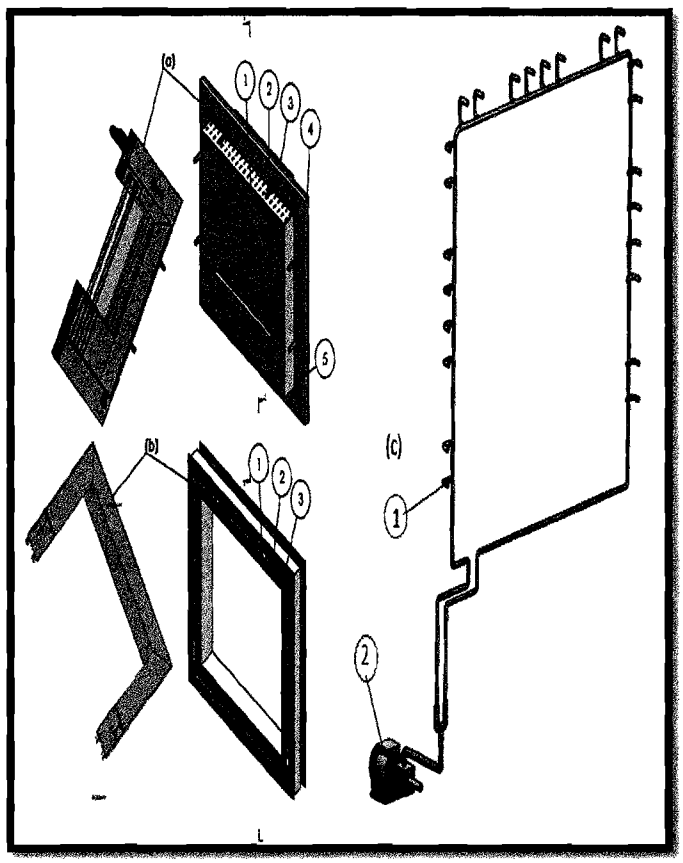
Shape(F)



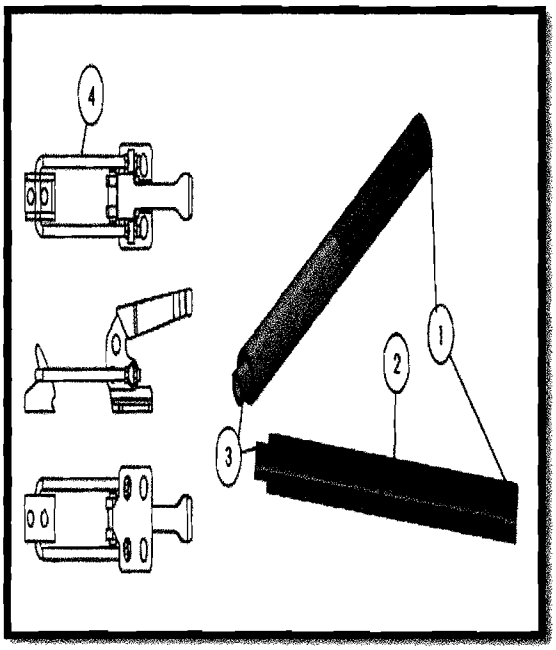
Shape(G)



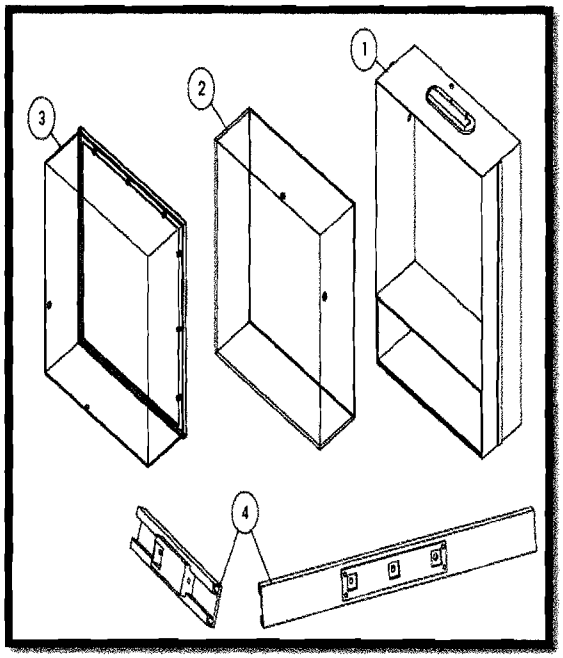
Shape(H)



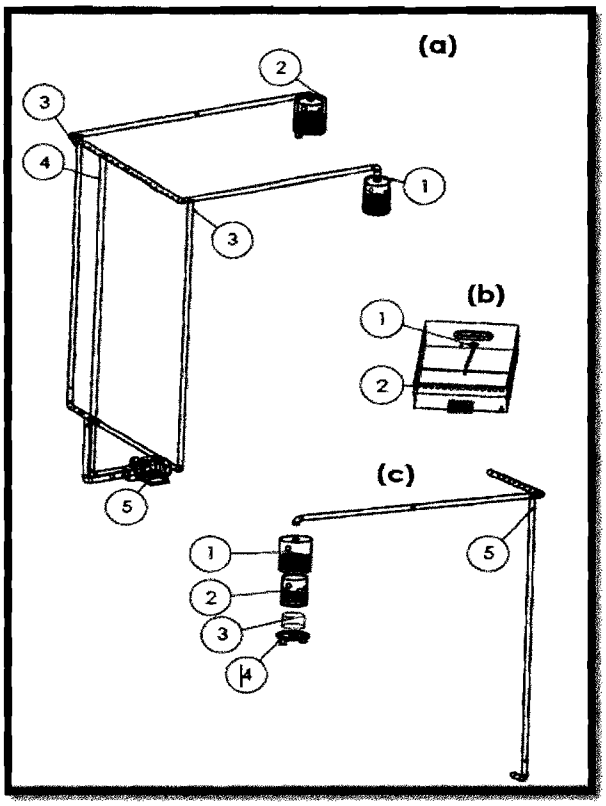
Shape(I)



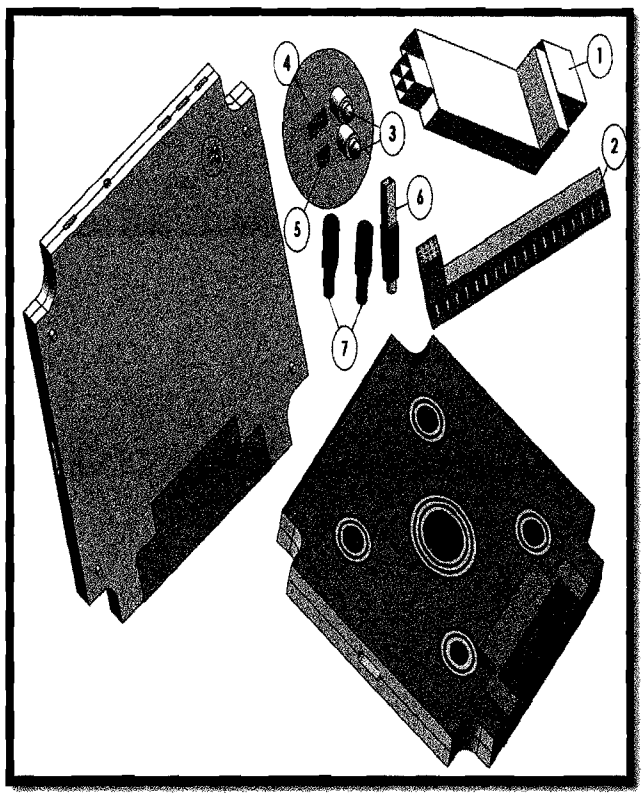
Shape(J)



Shape(k)



Shape(L)



Shape(M)

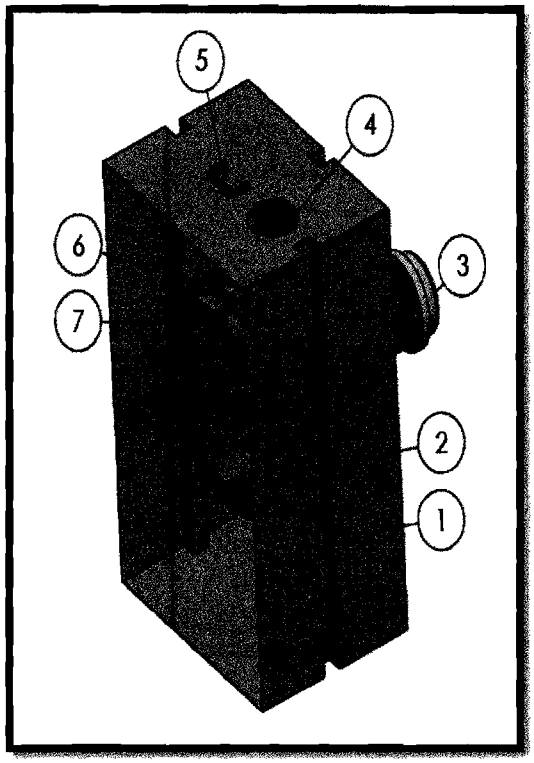


Figure i. Temperature distribution in the symmetric plane

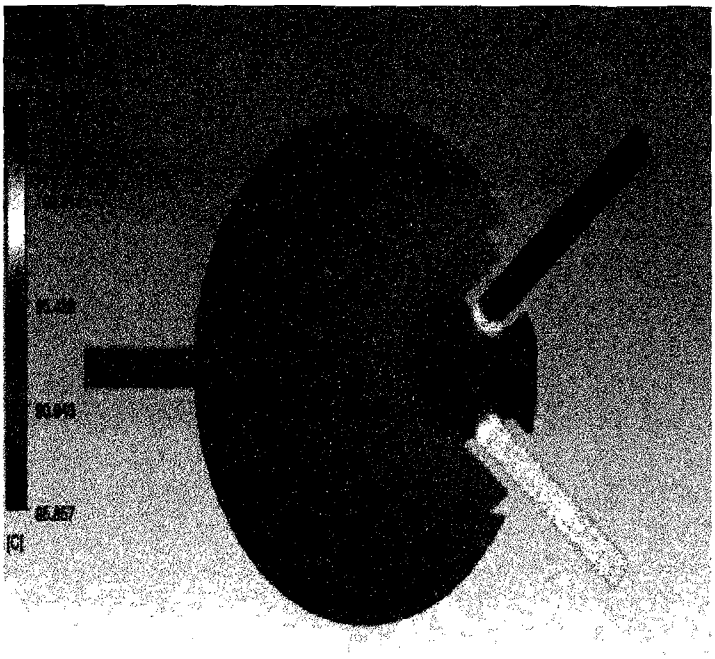


Figure ii. Velocity distribution on the symmetric Plane

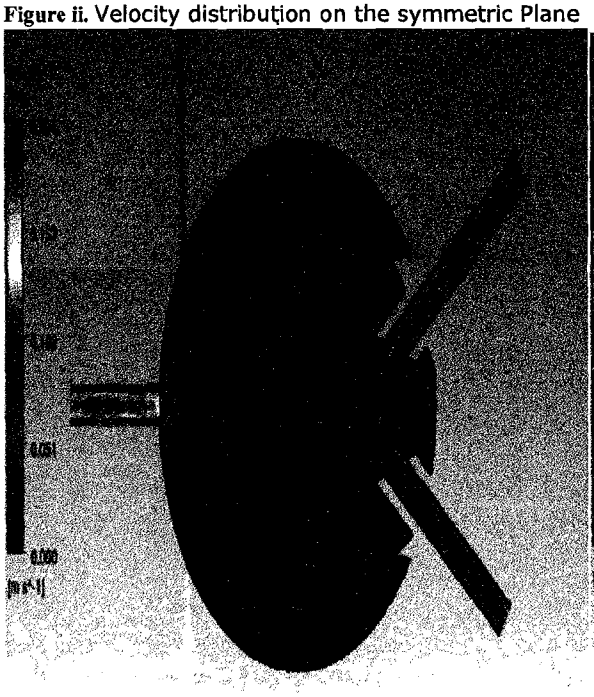


Figure iii. Volume Render of Temperature inside

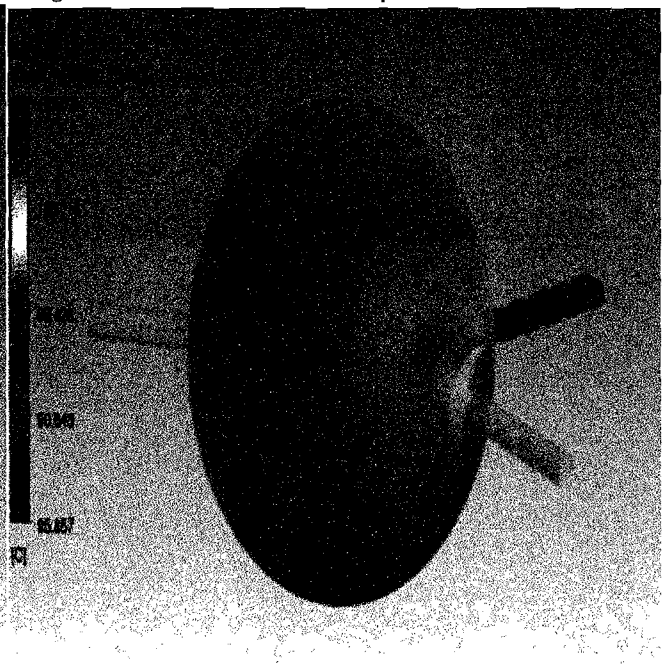


Figure iv. Streamlines

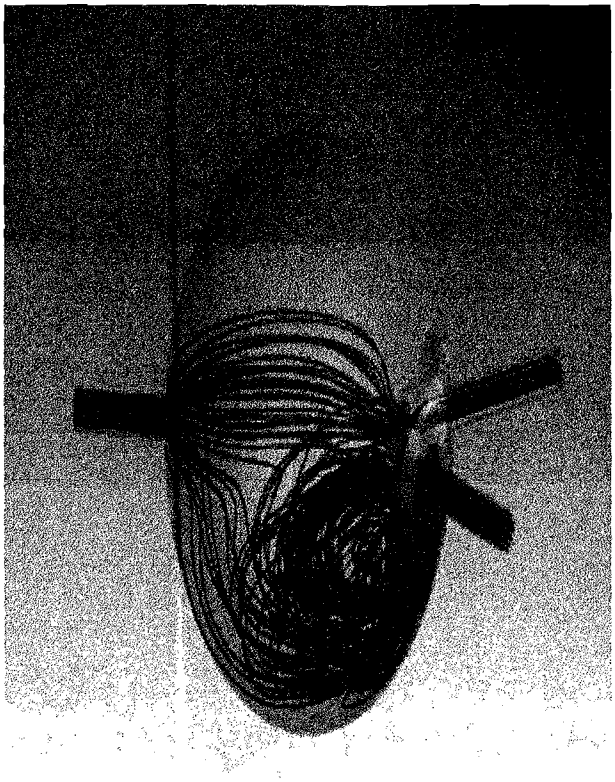
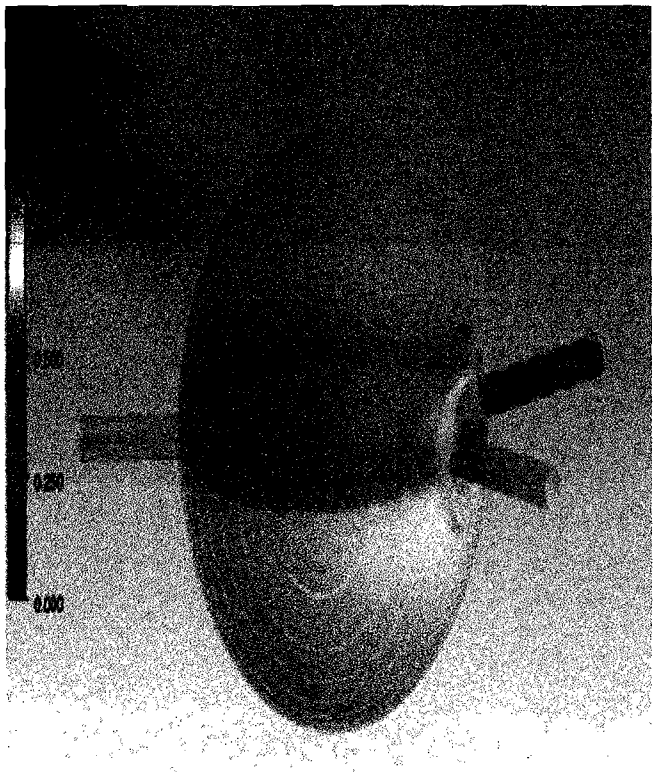


Figure v. Vapor concentration inside ball



INTERNATIONAL SEARCH REPORT

International application No.
PCT/EG2019/000028

A. CLASSIFICATION OF SUBJECT MATTER

A47J 27/08 (2006.01)i; G05D 23/13 (2006.01)i; G05D 22/00 (2006.01)i; G05D 16/00 (2006.01)i; A23L 5/10 (2016.01)i; G06F 3/0488 (2013.01)i; F16C 33/12 (2006.01)i; F24C 15/02 (2006.01)i; C10B 45/00 (2006.01)i; F24C 15/16 (2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47J 27/08; G05D 23/13; G05D 22/00; G05D 16/00; A23L 5/10; G06F 3/0488; F16C 33/12; F24C 15/02; C10B 45/00; F24C 15/16

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Google patents , Patent scope (WIPO), Espacenet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2016138828 A1 (ALIBABA GROUP HOLDING LTD [CN]) 09 September 2016 (2016-09-09) paragraph [30-41]	1,6,7,10,11
X	CN 104510367 A (IND TECH RES INST) 15 April 2015 (2015-04-15) the whole document	6,10,11
X	WO 2015032511 A1 (D & A CONCEPT DESIGN LTD [IE]) 12 March 2015 (2015-03-12) paragraph 7	2
X	US 2008246379 A1 (CHOUDHARY MANOJ K,) 09 October 2008 (2008-10-09) paragraph 21-50	2
X	CN 209172037 A1 (ZHEJIANG SUPOR ELECTRICAL APPLIANCES MFG CO LTD) 30 July 2019 (2019-07-30) all document	8

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
04 March 2020	**04 March 2020**

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/EG2019/000028

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☑ Claims Nos.: **11**
because they relate to subject matter not required to be searched by this Authority, namely:

software

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/EG2019/000028

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
WO	2016138828	A1	09 September 2016	CN	105981999	A	05 October 2016
CN	104510367	A	15 April 2015	TW	201513817	B	16 April 2015
WO	2015032511	A1	12 March 2015	US	2016213190	A1	28 July 2016
				EP	3041389	A1	13 July 2016
				EP	3042126	A1	13 July 2016
				GB	2517973	A1	11 March 2015
				US	2016192803	A1	07 July 2016
				WO	2015032931	A1	12 March 2015
US	2008246379	A1	09 October 2008	US	2009028673	A1	29 January 2009
CN	209172037	A1	30 July 2019	NONE			