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(54) **Heating cooker hob with gas burners**

(57) The heating cooker hob with gas burners and the top plate with heating fields has the thermal insulation plate (3) which is between the top plate (4) and the support bracket plate (1), and it has gas burners (2) with the inner diffusers (13) having the multi-layered little heating plates (14) of varied density nets thermally separated

from the casings of the burners, and it has the leading away of fumes module having the overpressure chamber (24) separated from the fumes chamber (23) by a slanted wall (20).

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Description

[0001] The subject of the invention is a heating cooker hob with gas burners, with the leading away of fumes module and possessing a closed combustion chamber as an element of kitchen cupboards or kitchen equipment in a caravan or being a part of a detached gas cooker.

[0002] There have been known the heating cooker hobs with gas burners and with the closed combustion chamber also having a vast system of ventilation which protects the structure of the hob against over heating.

[0003] In the above, either a convective or forced cooling systems are being used. This, however, requires a special construction of the hob with ventilation canals, holes and additional gaps enabling the self acting air cooling transfer.

[0004] Due to the above reasons the known heating hobs have a complicated, often multi levels construction which causes the increase of their weight.

[0005] In the majority of known gas burners used in heating hobs, the gas combustion takes place round the burner as a crown of single flames. There are also known the burners where there is a flameless combustion of the air-gas mixture inside the little canals of the ceramic plate being in the burner's head, heating it up to 900 ° C. Such combustion allows the higher thermal efficiency as the obtained warmth is transferred via radiation.

[0006] In the known ceramic heating cooker hobs the fumes which from burning of gas in gas burners are directed to the holes at the back edge of the hob and they spread in the kitchen. There are also some fittings known where the fumes are directed to a horizontal canal combined with a vertical one having a gap through which the air passes to strengthen the passing of fumes.

[0007] In these fittings the fumes are mixed with the air to decrease their temperature.

[0008] The inconvenience of the known heating hobs is their limited efficiency because part of the heat obtained from the combustion of gas causes the warming of the frame of the hob as well as the casing of the burners and is removed during its ventilation.

[0009] The inconvenience of the known gas burners is unequal distribution of temperature on the surface of the burner's head as well as their expanded height or length because they have diffusers outside the burners' heads.

[0010] The disadvantage of the known fittings for removing fumes is their small efficiency during the starting-up when the fumes canal is not warmed up.

[0011] To eliminate the above minuses a new solution has been worked out, namely a heating cooker hob with gas burners of higher efficiency not causing the heating the construction elements of the hob and burners, also having an innovating function of taking and cooling the fumes.

[0012] The essence of the invention is the heating cooker hob with gas burners, with a closed combustion chamber and with a top plate, having special thermal

insulation plate, thanks to which, the heating hob does not need ventilation and what is more, it has high efficiency and a simple structure. The heating hob is also equipped with the module of leading away and cooling the fumes.

[0013] The heating cooker hob, according to the invention has a support bracket on which gas burners with fumes canals, the electrodes of the ignition sparks, electrodes of the detectors of flames and a steering-indicator panel are fixed. To the lower part of the heating hob there is the gas equipment fixed, e.g. a gas distributor, gas pipes and electric valves.

[0014] On the top of the heating cooker hob there is a top plate on which heating areas are printed. They are placed over the gas burners where is also a steering-indicator field over the steering-indicator panel situated.

[0015] The top plate with heating fields can be ceramic, artificial material resistant to temperature, or alloy of metals.

[0016] Between the support bracket and the top plate with heating fields there is a thermal insulation plate placed that fills the space between the plates.

[0017] In the thermal insulation plate there are slots made, of suitable shapes and size, for gas burners, a slot for a steering-indicator panel, and fumes canals joining the gas burners slots and the fumes outlet in the back part of the heating hob.

[0018] In the heating hob there have been used injector gas burners of special design that does not cause any warming up the casings of the burners. The burners take air needed for gas burning from the bottom of the hob.

[0019] The gas burner of the heating hob has a casing in the shape of a cylinder with the bottom and a shaft, inside which, in its lower part, there is a horizontal diffuser and in the upper part there is a small heating plate consisting of a few layers of nets. The horizontal diffuser which is inside the casing of the burner has an inlet by the hole of the side wall of the casing and an outlet in the strictly defined distance from the opposite, inner wall of the casing. Near its inlet the diffuser has constant cross-section which, in the middle of its length, smoothly widens until the outlet. Opposite the entrance of the diffuser, outside the casing of the burner, there is a gas nozzle fixed to the support element in the shape of a letter 'U' having its side spaces open through which the air is being sucked. The support element is fixed to the casing of the burner.

[0020] The little heating plate in the upper part of the burner is made is made from a few layers of nets of various thickness and the density of eyelets (holes). The nets may be made of metal, artificial material or other material resistant to temperature. The upper net, made of average thickness wire is a heating radiator because in the eyelets of this net the gas is being burnt. The lower net, which has dense eyelets, makes the flame burning evenly and is a protection against the flame going back as well as it makes a thermal division between the upper net and the construction net. The next net, made of thick-

er wire, with larger eyelets is a construction element of the heating plate. The lower net, having the most dense eyelets, is supposed to mix up and blend evenly an gas-air mixture by splitting its structure. The number of nets of the heating plate may differ but nets have to meet the required tasks.

[0021] The heating plate is placed in the shaft of the casing of the burner through an insulating element and a clasping ring fixed to the shaft. That fixing ensures the stability of the structure and that the casing of the burner would not warm up. The shape of the plate is suitable to the shape of the casing of the burner and it can be optional: round, oval or similar.

[0022] The outlet of fumes from the heating cooker hob is linked with the module of leading away fumes which has a casing in which there is a fumes chamber and an overpressure chamber joined to the ventilator. The chambers are separated from each other with a slanting wall which has, near the edge, a track, a way through in the form of a crack or a row of holes.

[0023] The fumes chamber has its outlet of fumes situated opposite the overpressure chamber and its inlet upright to the outlet.

[0024] The inlet of fumes of the module of leading away fumes is linked to the closed combustion chamber of the heating cooker hob.

[0025] The ventilator of the module of leading away fumes, switched on the moment the heating cooker hob is switched on, pushes the air to the overpressure chamber. The streams of air coming through the holes in the track in the slanting wall of the overpressure chamber, directed towards the outlet, cause the overpressure in the inlet of fumes which is in the upper part of the module. In the effect there happens the sucking up the fumes from the closed combustion chamber of the heating cooker hob and their cooling down.

[0026] The object of the invention is shown in the pictures, in the presented example, in which fig. 1 presents the heating cooker hob with removed top plate shown from the top. Fig. 2 presents the heating cooker hob shown from the bottom, fig. 3 presents the transverse cross-section of the hob, fig. 4 presents a cross-section of the burner, fig. 5 presents the inside of the burner, fig. 6 presents the cross-section along the module of leading away fumes, fig. 7 presents the module of leading away fumes from the top.

[0027] The heating cooker hob has the support bracket 1 to which, in its upper part, gas burners 2 are fixed, a steering-indicator panel 6 and ignition sparks electrodes 10, and detectors of flames electrodes 11. To the bottom part of the support bracket 1 there are gas elements feeding the burners fixed, such as gas distributor 8, electrovalves 7, and gas pipes 9.

[0028] From the top the heating cooker hob is covered with the ceramic top plate 4 on which there are heating areas printed, placed over the gas burners 2, as well as the steering-indicator field over the steering-indicator panel 6.

[0029] Between the support bracket 1 and the ceramic plate 4 there is a thermal isolation plate 3 which fills the whole space between the plates. In the thermal isolation plate 3 there are made round slots for gas burners 2, and a slot for the steering-indicator panel 6. In the thermal isolation plate 3 there are also made fumes canals 5 connected with the outlet of fumes canal 12 which is in the back part of the heating cooker hob.

[0030] Thermal isolation plate 3 separates the support bracket 1 from hot fumes. In the heating cooker hob the injector burners, taking the air from under the bottom of the hob, have been used. In the burners the gas is being burnt flameless and their construction ensures that it would not warm up.

[0031] The heating cooker hob is switched on by setting the working parameters of a particular burner on the steering-indicator panel. Impulse switching on of the electro-valve 7 of the particular burner opens suitable gas flow to the burner. The switching of gas starts with the ignition electrode 10. The flames detector electrode 11 controls the work of the burner and, if necessary, disconnects the gas flow. The emissions from gas combustion in the burners are directed through the fumes canals 5 to the outlet 12 which is connected with the module of leading away fumes.

[0032] The gas burner 2 consists of the casing in the shape of a cylinder with a shaft at the bottom of which there is a horizontal diffuser 13 of a rectangular cross-section widening in the horizontal surface from about the half of the length. The outlet of the diffuser 13 is in a strictly defined distance from the opposite inner vertical wall of the casing of the burner. The inlet of the diffuser 13 is linked with the hole in the wall of the casing of the burner 2. Opposite the inlet of the diffuser 13 there is a gas nozzle 15 fixed to the support element 16 in the shape of the letter 'U' fixed to the shaft and the bottom of the burner 2. The side and open spaces of the support element 16 are a kind of windows through which the air needed for gas combustion is being sucked into. The size of these side windows depends on the length of the supporting element 16, which is constant for the specific capacity of the burner.

[0033] In the upper part of the burner there is a little heating plate 14 made of a set of four metal nets where each has a different function and different construction. The upper net is a radiator because in its eyelets the gas is being burnt. This net is made of an average thickness of wire. The lower net, with eyelets of larger density functions as a flame stabilizer, and protects against possible going back of the flame as well as it also makes the thermal distance from the next net. The lower net is a construction element of the little heating plate and is made of thicker wire with larger eyelets. The bottom net has its eyelets of the largest density and ensures equality of the gas-air mixture by splitting the gas structure.

[0034] The little heating plate 14 is placed in the shaft of the casing of the burner 2 by a thermal insulation ring 17 and it is fixed to the casing of the burner by a clasping

ring 18 with the help of screws.

[0035] Gas is directed to the burner through a nozzle 15 to the diffuser 13. The stream of gas sucks the air through the side windows of a supporting element 16. In the diffuser 13 gas initially gets mixed with the air and at the same time the speed of that mixture flow is being reduced. The gas mixture then hits the opposite inner vertical wall of the casing of the burner 2 and fills the casing causing the overpressure in there. The gas mixture flows outside through a little heating plate 14 where it gets mixed thoroughly on the lower net, and gets evenly burnt in the eyelets of the upper net of the plate 14.

[0036] Thanks to insulation 17 and a precise mixing of gas, there can be achieved the following: the equable spread of temperature on the surface of the whole little heating plate, high efficiency of the burner as well as not warming up the casing of the burner.

[0037] The module of leading away fumes consists of a cuboid fumes' chamber 23 having in its upper part the inlet of fumes 22, in its back part the outlet of fumes 12 opposite of which there is an overpressure chamber 24 combined with the ventilator 19, separated from the inlet and outlet by a slanted wall 20. In the slanted wall, in its lower part there is a passage in the form of rows of holes 21 through which the streams of air being pushed from the overpressure chamber 24 are flowing out towards the outlet 12.

[0038] Thanks to the thermal insulation that has been applied the construction of the heating cooker hob is simple because the hob does not require ventilation needed to cool down the construction elements of the hob. The advantage of the hob is its high thermal efficiency because the waste of heat is expelled by the ventilation.

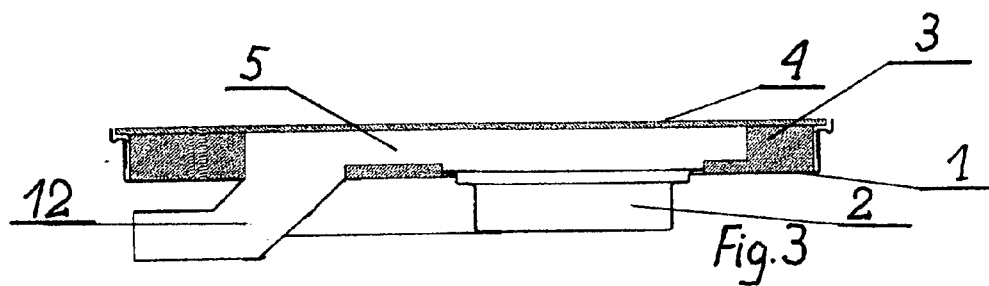
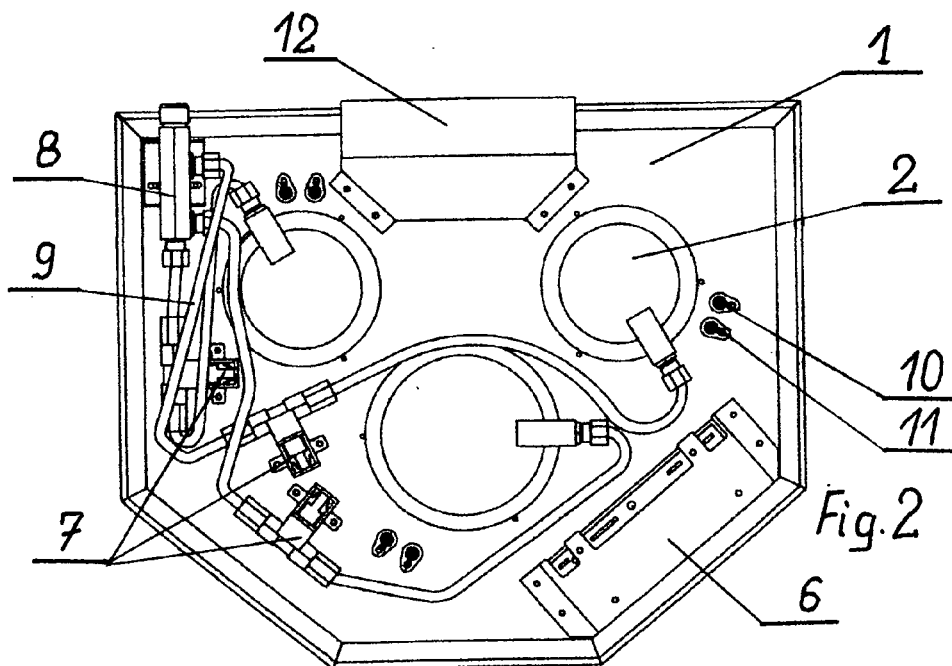
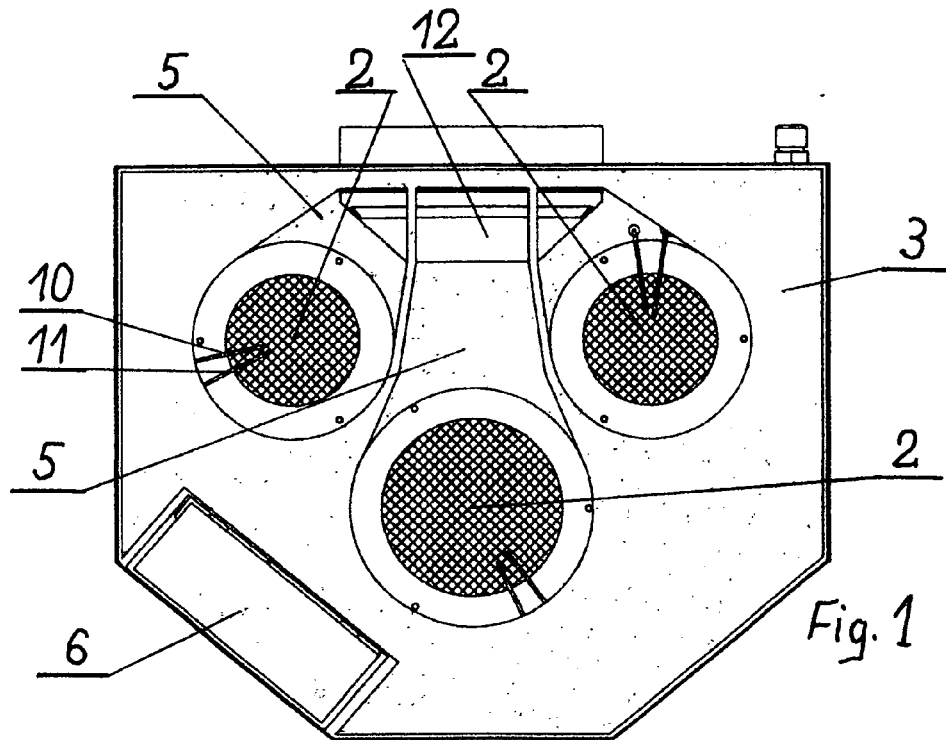
[0039] The gas burner, according to the invention, ensures the constant and the same temperature all over the whole little heating plate. Thanks to the insulation the casing of the burner does not warm up. Suitably chosen little heating plate, the diffuser and the supporting element of the nozzle ensure stable and proper functioning of the burner with various kinds of gas, without any regulation, except a change of the nozzle. The burner has high efficiency and stability of work. It is resistant to being shaken or hit. Its height and length are small, which is an advantage in its appliances.

[0040] The module of leading away fumes starts working efficiently from the moment of switching on the ventilator which is activated in the moment the gas burner starts working. The module characterizes its high efficiency.

[0041] The heating cooker hob with gas burners, according to the invention, may have a wide usage in the household as well as the equipment in tourist vehicles such as cars, caravans, or floating units such as ships, yachts etc.

Claims

1. The heating cooker hob with gas burners having the top plate with heating fields and the support bracket plate characteristic of the fact that between the top plate (4) with heating fields and the support bracket plate (1) there is a thermal insulation plate (3) and gas burners (2) having multi-layered little heating plates (14) of varied density nets, and a module of leading away fumes having an overpressure chamber (24) separated from fumes chamber (23) by a slanted wall (20).
2. The heating cooker hob with gas burners according to claim 1 characteristic of the fact that in the thermal insulation plate (3) there are made slots for gas burners (2) and the canals (5) for leading away the fumes.
3. The heating cooker hob with gas burners according to claim 1 characteristic of the fact that the gas burner (2) has a horizontal diffuser (13) placed inside the casing of the burner.
4. The heating cooker hob with gas burners according to claim 1 characteristic of the fact that the multi-layered heating plate (14) of the gas burner (2) is thermally separated from the casing of the burner.



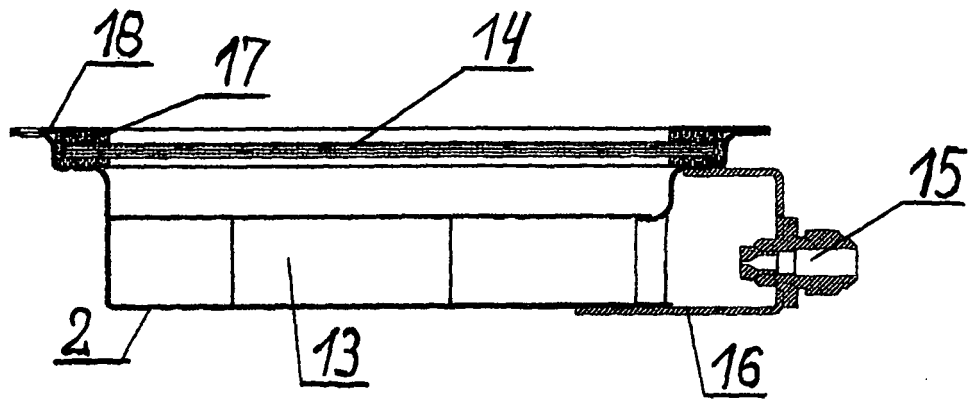


Fig. 4

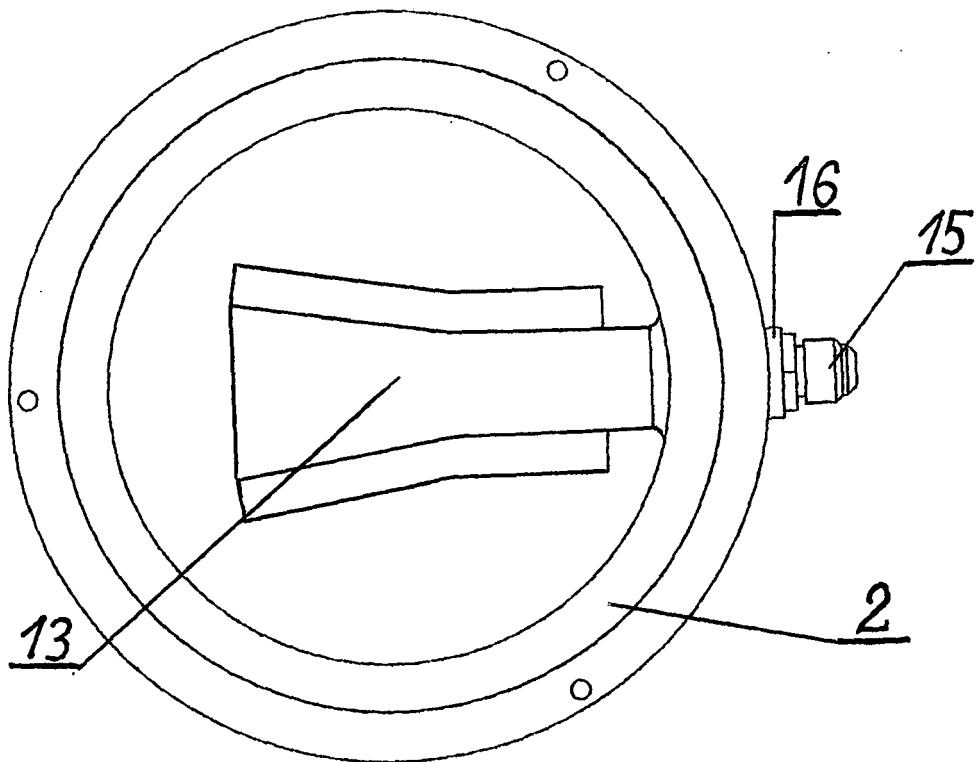


Fig. 5

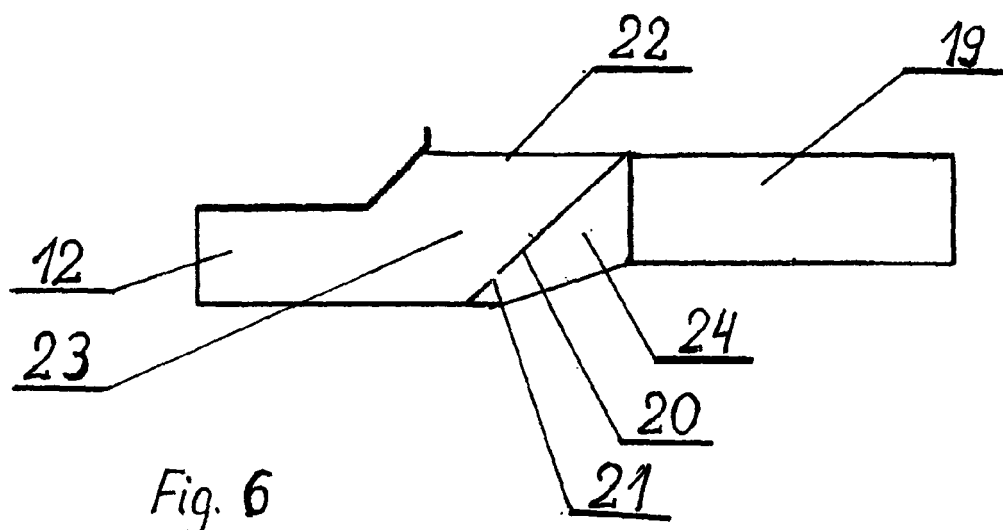


Fig. 6

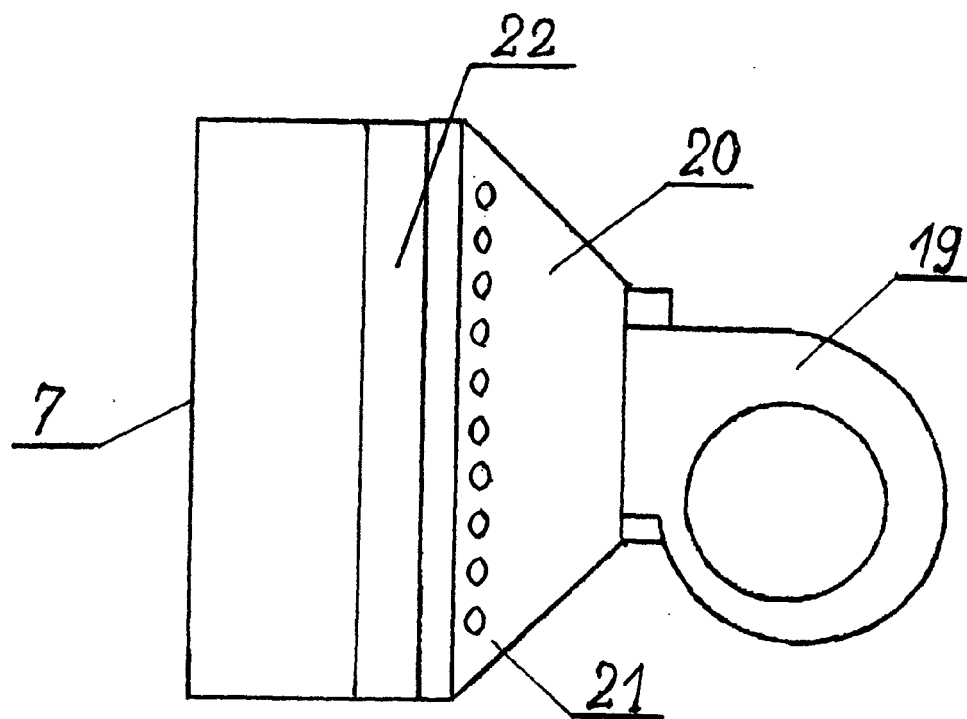


Fig. 7