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(54) **Burner for stoves fired by pellets, woodchips, cereals and vegetables waste in general**

(57) The finding concerns a burner for stoves fired by pellets, woodchips, cereals and vegetable waste in general. Such a burner is characterised in that on the plane of the brazier (1) a device acts that continuously cleans the base grid (9), equipped with entry holes for comburent air. Said device consists of a scraping blade (7) arranged above and in contact with the grid, said blade and said grid being moved reciprocally and in opposite directions.

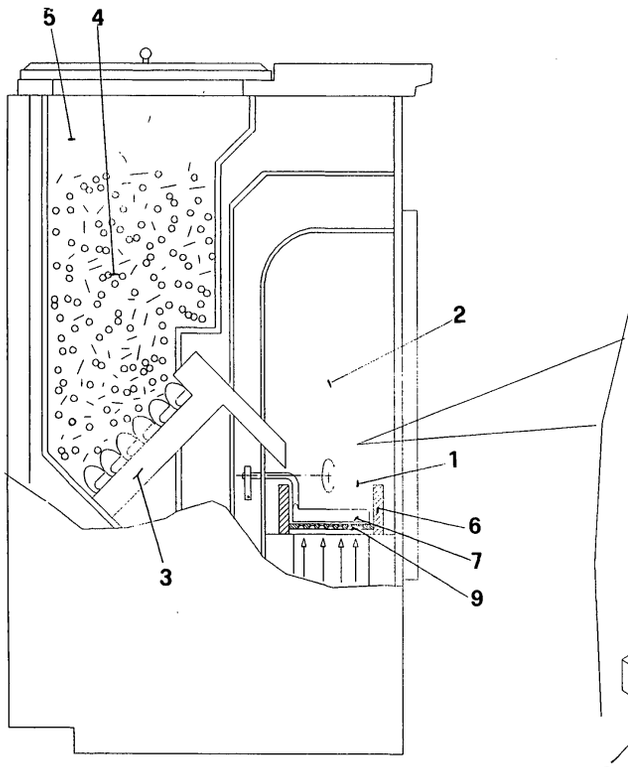

FIG.1

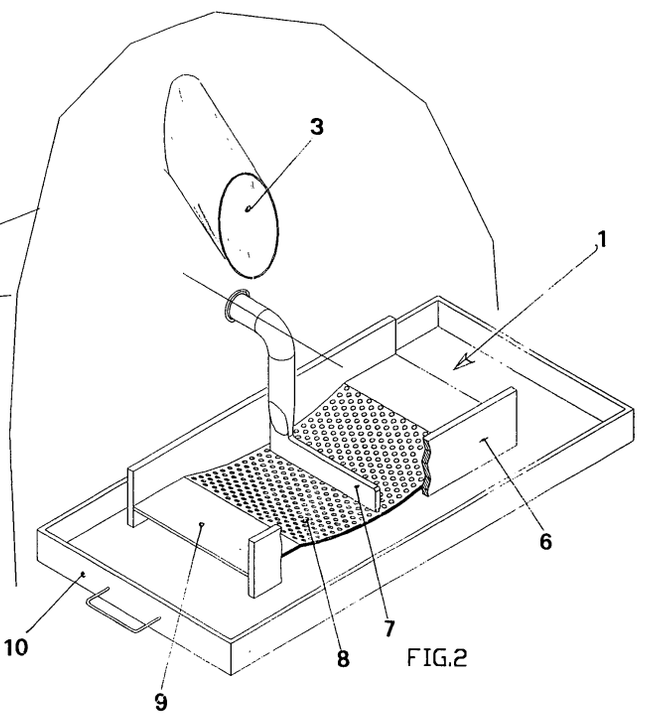

FIG.2

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Description

[0001] The present finding concerns a burner particularly suitable for stoves fired by pellets, woodchips, cereals and vegetable waste in general.

[0002] In stoves for heating of the pellet type, the fuel is contained in a collection space, arranged outside or directly inside the stove body, from where, through an Archimedean screw, it is taken to be gradually deposited in the burner.

[0003] The burner consists of a fuel collection tank, equipped with a perforated bottom through which comburent air enters into the combustion chamber.

[0004] Usually, the fuel collection tank is square or rectangular shaped and is equipped with vertical walls that define the brazier and have the task of containing the ashes.

[0005] However, such an embodiment suffers from the drawback that, after a certain period of operation of the stove, on the bottom and, in particular, at the corners of the base, where the turbulence action caused by the air sucked in is less strong, the ashes and the other products of the combustion accumulate, with the consequence that a part of the air holes is blocked thus generating irregular combustion.

[0006] Currently, such a drawback occurs with substantial intensity since, with the rapid spread of pellet burners, the supply of this particular type of fuel has consequently also increased, which creates a substantial amount of ash.

[0007] Such a need has led to the fact that the producers of pellets and woodchips, to tackle the ever increasing demand, have been forced to use alternative products to just wood, such as processing residues, coming from joineries and from furniture industries, which also contain chemical, plastic and gluing substances and, moreover, to cut costs, they have released different combustible products onto the market, again as an alternative to wood, such as cereals and vegetable waste in general.

[0008] These alternative fuels, during combustion, in addition to normal ash, also produce substances that melt forming, when cooled down, a solid layer on the base of the brazier; such a layer adds to the unburned products, such as salts, silicon and other impurities, with this causing the blocking of the air holes on the brazier, to such a point as to lead to the flame going out and therefore drastically corrupting the thermal yield of the stove.

[0009] The purpose of the present finding is that of making a burner that allows complete combustion to be obtained even using poor quality solid fuels.

[0010] Specifically, the purpose of the finding is that of making a burner in which the through holes for the comburent air present on the base grid are never blocked.

[0011] A further purpose of the finding is that of making a self-cleaning burner, in which the ash and the other solid products of combustion are taken away from the brazier automatically.

[0012] Such purposes are obtained by foreseeing that a device acts on the plane of the brazier that continuously cleans the base grid, equipped with entry holes for the comburent air.

[0013] Such a device consists of a scraping blade arranged above and in contact with the grid, where said blade is moved with respect to said grid.

[0014] The finding foresees a first embodiment, where the blade is equipped with alternative movement, substantially rectilinear or swinging and the grid remains fixed, as well as a second embodiment, where the blade remains still whilst the grid is equipped with alternative rectilinear movement and furthermore a third embodiment, in which the blade and the grid are both equipped with opposite alternative movement.

[0015] With such constructive solutions the end effect is obtained that the blade applies a scraping action on the surface of the grid, which allows a double effect to be achieved: that of cleaning the base of the grid, at the air holes and that of moving the combustion products sideways, on both sides.

[0016] The finding also foresees that the tank that define3s the brazier is open on the two opposite side walls, which allows the lateral discharge of the ashes and of the other combustion residues from the brazier itself.

[0017] In greater detail, at each alternative movement of the blade on the grid the ashes are moved onto the two sides of the tank and, gradually accumulating, they are pushed to the two open ends of the tank, until they spontaneously fall into the ash-collection drawer below.

[0018] The finding shall be described hereafter in a possible embodiment thereof, given as a non-limiting example, with the help of the attached tables of drawings; where:

- fig. 1 (Table I) represents a front elevation section view of a pellet stove equipped with the brazier according to the finding;
- fig. 2 represents a perspective detailed view of the brazier according to the finding;
- figs. 3 to 5 (Table II) represent the working steps of a brazier according to the finding, equipped with a mobile blade.
- figs. 6 to 8 represent the working steps of a brazier according to the finding, equipped with a mobile grid.

[0019] As can be seen in fig. 1, the brazier, wholly indicated with reference numeral 1, arranged inside the furnace 2, is supplied, through the Archimedean screw 3, with the fuel 4, contained in the accumulation space 5.

[0020] The brazier 1 comprises, in addition to the tank

6 for collecting and containing the fuel and ashes, also a blade 7, arranged substantially in contact with the perforated base 8 of the grid 9 of said brazier.

[0021] As can be seen in figure 2, the blade 7 is arranged vertically with respect to the base 8 and is equipped with alternative angular motion or circular motion, obtained with *per se* known mechanisms, for which in each step corresponding to a swinging period or to a complete turn, the blade carries out a scraping action and therefore continuously cleans the perforated base itself, onto which the pieces of fuel fall and are deposited.

[0022] The finding foresees that the perforated base 8 is slightly concave so as to ease the depositing of the pieces of fuel and to increase the contact surface between the scraping wire and said surface during the angular movement of said blade.

[0023] As can easily be seen by observing the succession of steps according to figs. 3 to 5, each alternative periodic angular movement of the blade 7 causes a sideways movement of the ashes, which gradually accumulate on the two sides of the tank. Said sides, being open, allow these ashes to fall freely, into a collector 10 below.

[0024] In the same way, as can be seen by observing the succession of steps according to figs. 6 to 9, the continuous cleaning of the perforated grid and the spontaneous discharge of the ashes is carried out by keeping the blade 7 fixed and equipping the entire tank 6 of the brazier or just the perforated grid 9 with alternative rectilinear movement.

[0025] That which has been described above allows it to be stated that, without any constructive complication, the purposes set previously have been accomplished; in particular, it is possible to always keep the combustion regular, with the stove being able to be supplied by a regular flow of air (nominal flow); it is also possible to continuously and automatically remove and discharge the ashes and the other combustion products from the brazier.

Claims

1. BURNER FOR STOVES FIRED BY PELLETS, WOODCHIPS, CEREALS AND VEGETABLE WASTE IN GENERAL, **characterised in that** on the plane of the brazier a device acts that continuously cleans the base grid, equipped with entry holes for comburent air, said device consisting of a scraping blade arranged above and in contact with the grid, said blade and said grid being moved reciprocally and in opposite dire4ctions.

2. BURNER, according to claim 1, **characterised in that** the blade is equipped with alternative substantially rectilinear movement, whereas the grid remains fixed.

3. BURNER, according to claim 1, **characterised in that** the blade is equipped with swinging movement, but the grid remains still.

4. BURNER, according to claim 1, **characterised in that** the blade remains fixed, whereas the grid is equipped with alternative rectilinear motion.

5. BURNER, according to one or more of the previous claims, **characterised in that** the tank that defines the glazier is open on the two opposite side walls, which allows the lateral discharge of the ashes and of the other combustion residues from the brazier itself.

6. BURNER, according to claim 5, **characterised in that** at each alternative movement of the blade on the grid, or vice-versa, the ashes are moved onto the two sides of the tank and, gradually accumulating, they are pushed to the two open ends of the tank, until they spontaneously fall into the ash-collection drawer below.

7. BURNER, according to one or more of the previous claims, of the type where the brazier (1), arranged inside the furnace (2), is supplied, through the Archimedean screw (3), with the fuel (4), contained in the accumulation space (5), said burner being **characterised in that** the brazier (1), in addition to the tank (6) for collecting and containing the fuel, also consists of a blade (7), arranged substantially in contact with the perforated base (8) of the grid (9) of said brazier.

8. BURNER, according to claim 7, **characterised in that** the blade (7) is arranged vertically with respect to the base (8) and is equipped with alternative angular motion, obtained with *per se* known mechanisms, for which in each step corresponding to a swinging period, the blade carries out a scraping action and therefore continuously cleans the aforementioned perforated base(8), onto which the pieces of fuel fall and are deposited.

9. BURNER, according to claim 7, **characterised in that** the blade (7) is arranged vertically with respect to the base (8) and is equipped with circular motion, obtained with *per se* known mechanisms, for which in each complete turn, the blade carries out a scraping action and therefore continuously cleans the aforementioned perforated base(8), onto which the pieces of fuel fall and are deposited.

10. BURNER, according to one or more of the previous claims, **characterised in that** the perforated base (8) is slightly concave so as to ease the depositing of the pieces of fuel and to increase the contact surface between the scraping wire of the blade and

said surface during the angular movement of said blade.

11. BURNER, according to one or more of the previous claims, **characterised in that** each alternative periodic angular movement of the blade (7) causes a sideways movement of the ashes, which gradually accumulate on the two sides of the tank (6), said sides being open to allow the aforementioned ashes to fall freely onto a collector (10) below.

12. BURNER, according to one or more of the previous claims, **characterised in that** each alternative periodic angular movement of the entire tank (6) causes a sideways movement of the ashes, which gradually accumulate on the two sides of the tank, said sides being open to allow the aforementioned ashes to fall freely onto a collector (10) below.

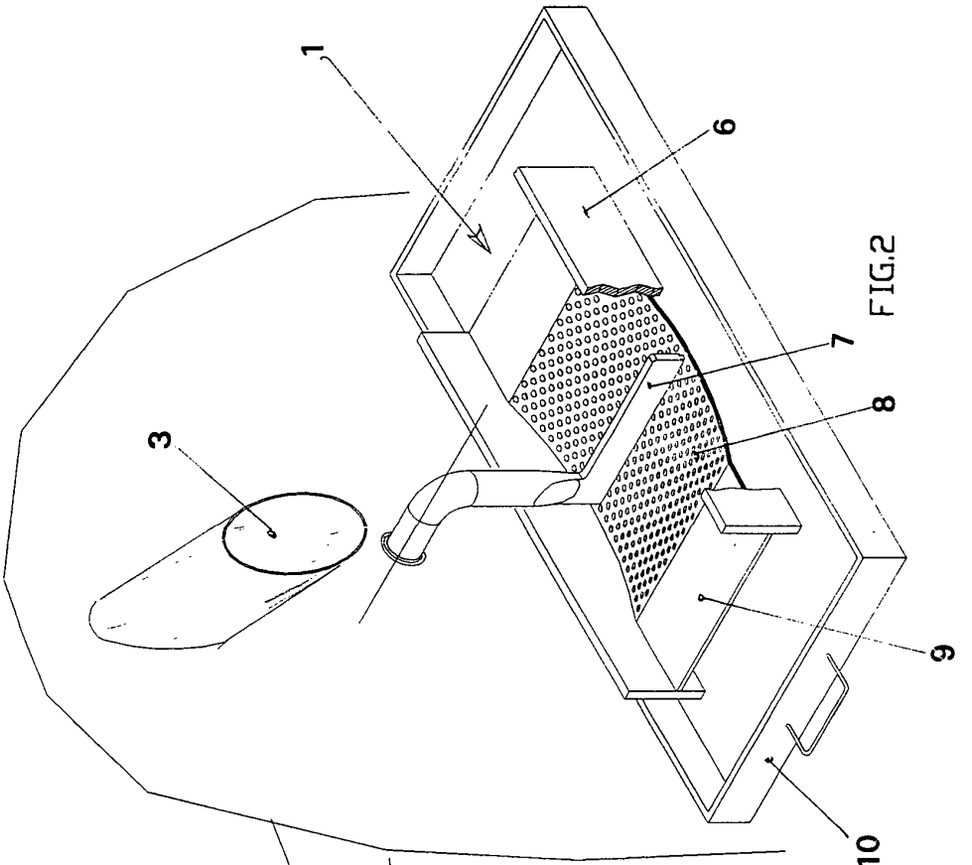

FIG.2

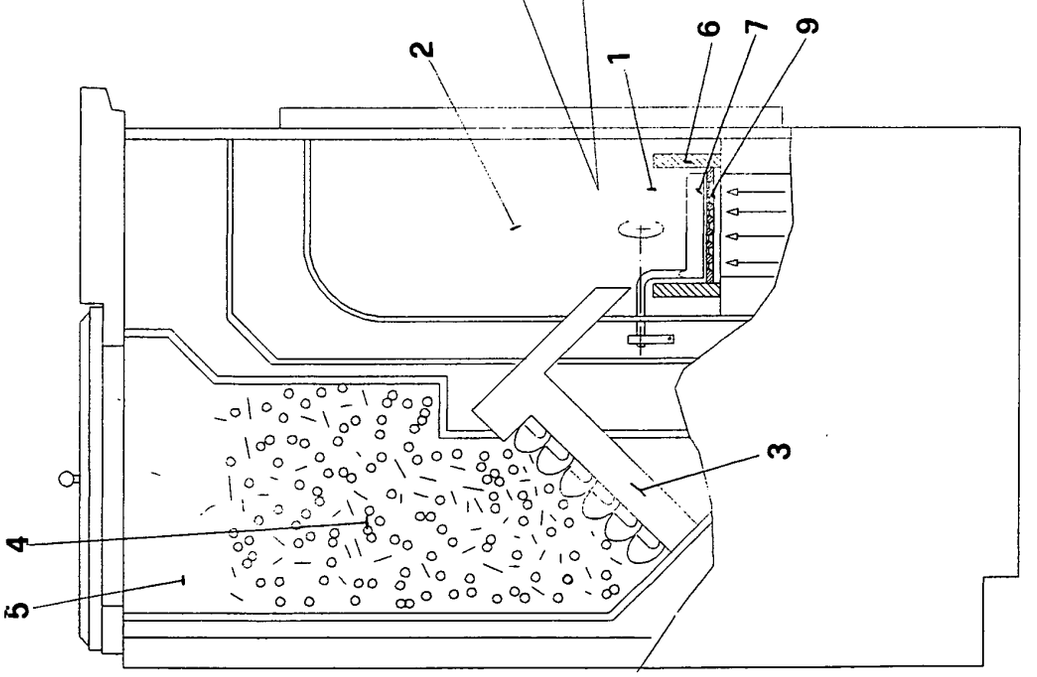

FIG.1

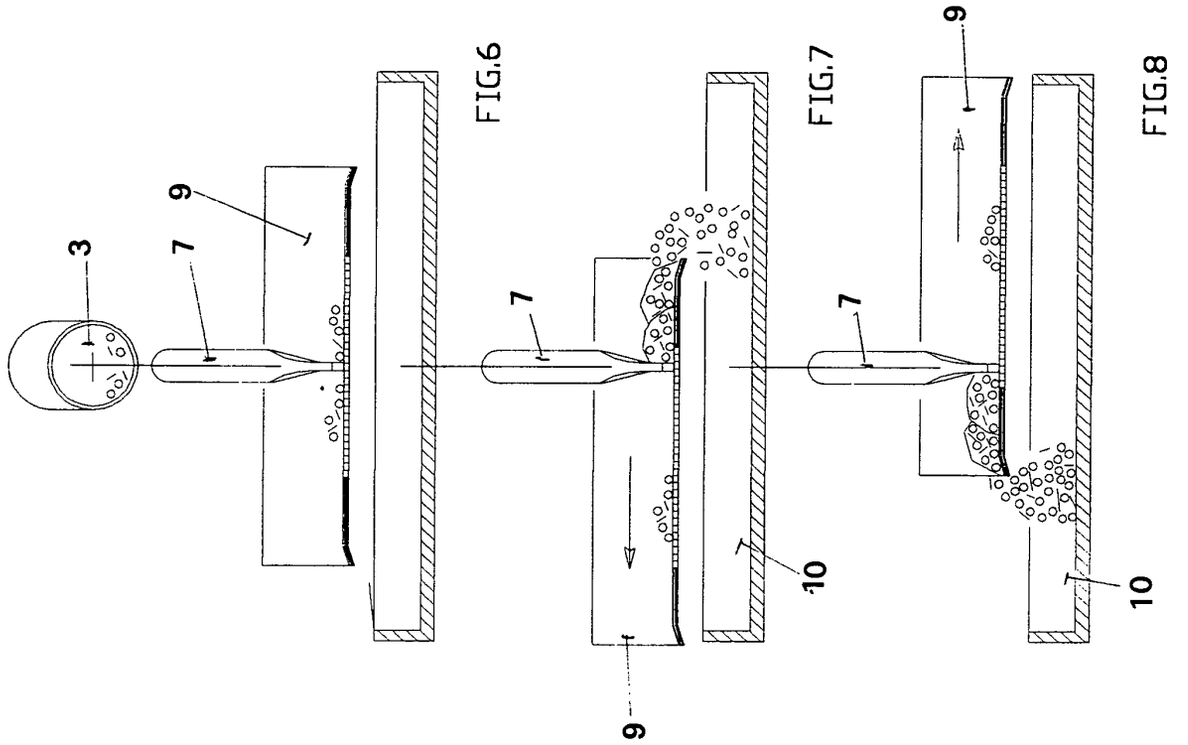

FIG.6 FIG.7 FIG.8

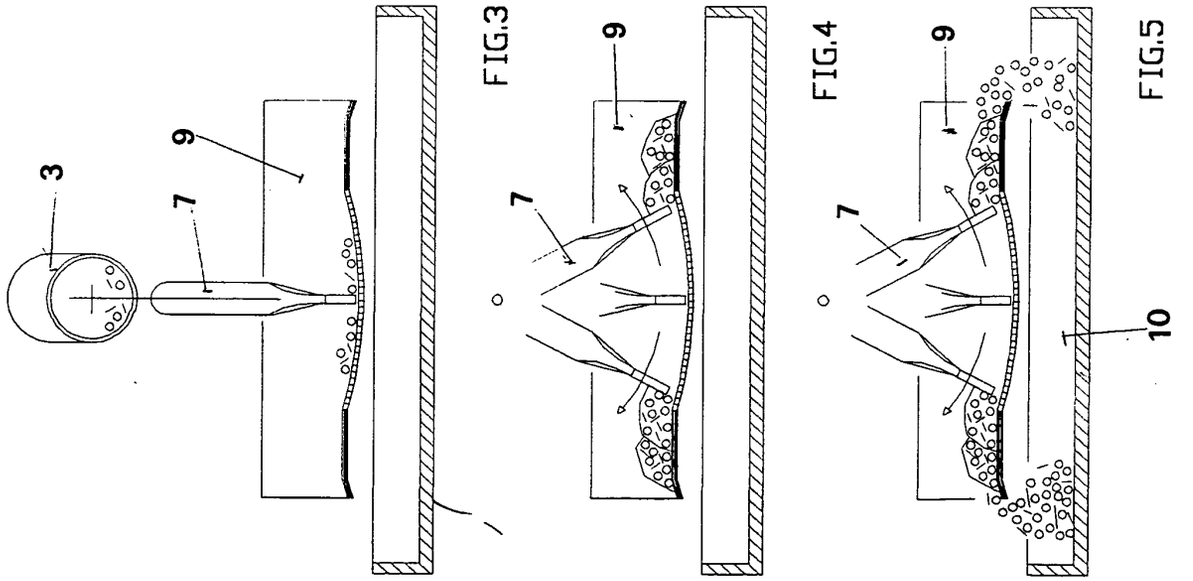

FIG.3 FIG.4 FIG.5

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EUROPEAN SEARCH REPORT

Application Number
EP 05 00 0369

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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	12 April 2005	Coquau, S

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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