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(54) SOLID FUEL BIOMASS STOVE

(57) Biomass solid fuel stove (1) comprising an access door (2) and a brazier formed by a bottom grate (4) and walls (3) characterized in that the bottom grate (4) is rotatable or sliding under the walls (3) and that said bottom grate (4) is connected to the access door (2) through connecting means (5,6) so that each time the access door (2) is opened, the connecting means (5,6) make the bottom grate (4) slide or turn under the walls (3).

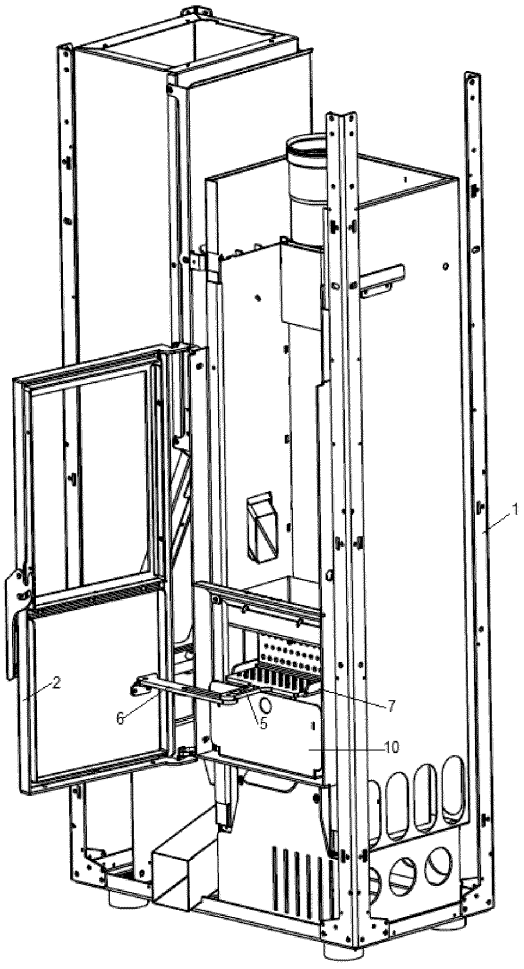

Fig. 2

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Description

Technical field of the invention

[0001] The present invention relates to the construction of a solid fuel biomass stove, equipped with a facilitated cleaning system, to empty the brazier of ash, dust, small residues of unburned or partially burned material, at the end or at the beginning of each phase of combustion by opening and closing the access door to the burn pot of the stove.

State of the art

[0002] Solid fuel biomass stoves need to be cleaned daily to have a high efficiency.

[0003] In the brazier of solid fuel biomass stoves, when the stove is turned off, ash, dust, small residues of unburned or partially burned material remain. When re-ignited, these materials slow down or even prevent the stove from restarting and in any case lower the efficiency of said stove. To ensure efficient combustion, it would be advisable to empty the brazier of ash, dust, small residues of unburned or partially burned material when switching off or restarting the stove when the stove is switched off or on again. When it is switched off, the manual emptying of the brazier is particularly difficult as it is particularly hot due to the combustion that took place in it. To be able to carry out the operation safely, the stove should be turned off in advance, allowing said stove to cool down, the time required for its cooling is about two hours and then proceed with manual emptying of the brazier. Very often the user does not know when to turn off the stove in advance and therefore when the brazier is turned back on it will be dirty with ash, dust, small residues of unburned or partially burned material. Before re-ignition, the user should remember to clean the brazier and start re-ignition, to improve the efficiency of the stove.

[0004] To overcome these drawbacks, motorized mechanisms have been studied which operate a scraper that cleans the bottom grate of the brazier of a particle solid material stove as shown in EP1559957A1.

[0005] However, the solution proposed in EP1559957A1 shows some disadvantages which can be summarized as follows:

- The presence of an engine introduces difficulties linked to the fact that said engine must be kept efficient, increasing the cost of the stove;
- The motor must be operated by the user to clean the stove and the user must remember to operate the scraper otherwise the grate remains dirty;
- As the scraper is rotating it cannot scrape all the material on the bottom grate of the brazier.

[0006] US585677A describes a fire pot 2 with a grate 4 having perforations 5, the grate 4 can be turned acting on a shake-bar 7. The shake-bar 7 is moved manually and operator must remember to turn the grate lifting it in order to engage the spur 9 with the perforations 5.

[0007] The present invention aims to overcome these and other disadvantages.

Description of the invention

[0008] The present invention aims to produce a stove that does not have the disadvantages and drawbacks shown in the state of the art.

[0009] The main purpose of the present invention is to clean the bottom grate of the brazier at the end or at the beginning of each combustion cycle, by simply opening and closing the access door of the stove's brazier.

[0010] The main purpose of the present invention is to produce a solid fuel biomass stove comprising an access door and a brazier formed by a bottom grate and walls characterized by the fact that the bottom grate slides under the walls and that the grate is connected through connection to the access door so that each time the access door is opened, the connecting means make the bottom grate slide or turn under the walls.

[0011] Another feature is given by the fact that the connection means through which the bottom grate is connected to the access door are mechanical connection means.

[0012] Another feature is given by the fact that the connection means through which the bottom grate is connected to the access door are a rod integral with the bottom grate of the brazier and a connecting rod integral with the access door and that a pin, integral with the rod of the grate at the bottom of the brazier slides into a slot in the connecting rod.

[0013] Another feature is given by the fact that the bottom grate of the brazier slides in guides under the parts of the brazier.

[0014] Another feature is given by the fact that the means of connection through which the bottom grate is connected to the access door are a system of toothed wheels which, when the access door is opened, make the bottom grate rotate.

[0015] Other characteristics and advantages of the present invention will become clear from the following description of an embodiment of the present invention given by way of non-limiting example of Figures 1, 2, 3, 4 and 5.

Brief description of the figures.

[0016]

Figure 1 represents a section of a solid fuel biomass stove made above the brazier according to the object of the present invention;

Figure 2 represents an axonometric view of a solid

fuel biomass stove according to the object of the present invention;

Figure 3 represents a top view of a brazier of a solid fuel biomass stove according to the object of the present invention;

Figure 4 represents a front view of a brazier of a solid fuel biomass stove according to the object of the present invention;

Figure 5 represents a side view of a brazier of a solid fuel biomass stove according to the object of the present invention.

DESCRIPTION OF A FAVORITE MODE OF AN EMBODIMENT OF THE PRESENT INVENTION

[0017] An embodiment of a solid fuel biomass stove 1 according to the present invention is shown in Figures 1 and 2, it comprises an access door 2 to the brazier in which the solid biomass is burned. Solid fuel biomass stoves using wood material as fuel produce dust, ash and unburned or partially burned material. The deposit of dust, ash and unburned or partially burned material in the brazier of the solid fuel biomass stove worsens its performance and in some cases leads to the stove blocking. The stove 1 of the present invention comprises a brazier formed by the bottom grate 4 surmounted by the walls 3 which is accessed through a door 2. The bottom grate 4 of the brazier is connected with connection means 5, 6 to the access door 2 of the stove 1.

[0018] The connection means 5, 6 to the access door 2 of the stove 1 can preferably but not exclusively be mechanical connection means.

[0019] In a preferred embodiment, when the access door 2 is opened, the bottom grate 4 of the brazier is pulled by the connecting means 5, 6 to the access door 2 and, sliding under one of the walls 3 of the brazier, is cleaned by dust, ash and unburned or partially burned material, which on meeting the wall 3 of the brazier is forced to fall into the ash collection tray 10.

[0020] To improve the sliding of the bottom grate 4 of the brazier it can slide, preferably but not exclusively, in guides 7 placed under two opposite walls 4 of the brazier.

[0021] The connection means 5, 6 to the access door 2 are formed, preferably but not exclusively, by a rod 5 integral with the bottom grate 4 of the brazier and by a connecting rod 6 integral with the access door 2.

[0022] The connecting rod 6 has a slot 8 within which the pin 9 integral with the rod 5 of the bottom grate 4 of the brazier can slide.

[0023] When the door is opened, the connecting rod 6 pulls the bottom grate 4 of the brazier outwards through the rod 5, the bottom grate 4 of the brazier slides into the guides 7, and being forced to pass under the walls 3 of the brazier it is cleaned of dust, ash and unburned or partially burned material which, on meeting the walls 3 of the brazier, are forced to fall into the ash pan 10.

[0024] Closing the access door 2 of the solid fuel biomass stove through the connecting means 5, 6 to the access door 2 repositions the bottom grate 4 under the walls 3, recomposing the brazier with bottom grate 4 and walls 3 act to receive the fuel for its combustion ..

[0025] By simply opening and closing the access door 2, the bottom grate 4 of the brazier of the solid fuel biomass stove 1 is cleaned.

[0026] In another embodiment of the invention, when the access door 2 is opened, the bottom grate 4 of the brazier is made to rotate by the connection means 5, 6 to the access door 2 and, by turning on itself, it is cleaned from dust, ash and unburned or partially burned material, which in this way is forced to fall into the ash collection tray 10.

[0027] The invention, well understood, is not limited to the representation given by the tables but can receive improvements and modifications by the man of the trade without leaving the framework of the patent.

[0028] The present invention allows numerous advantages and to overcome difficulties that could not be overcome with the systems currently on the market.

Claims

1. Biomass solid fuel stove (1) comprising an access door (2) and a brazier formed by a bottom grate (4) and walls (3) **characterized in that** the bottom grate (4) is rotatable or sliding under the walls (3) and that said bottom grate (4) is connected to the access door (2) through connecting means (5,6) so that each time the access door (2) is opened, the connecting means (5,6) make the bottom grate (4) slide or turn under the walls (3).

2. Biomass solid fuel stove (1) according to claim 1 **characterized in that** the connecting means (5,6) through which the bottom grate (4) is connected to the access door (2) are mechanical connecting means.

3. Biomass solid fuel stove (1) according to claim 1 or 2 **characterized in that** the connecting means (5,6) through which the bottom grate (4) is connected to the access door (2) are a rod (5) integral with the bottom grate (4) of the brazier and a connecting rod (6) integral with the access door (2) and that a pin (9), integral with the rod (5) of the bottom grill (4) of the brazier, slides into a slot (8) of the connecting rod (6) integral with the access door (2).

4. Biomass solid fuel stove (1) according to any one of the preceding claims **characterized in that** the bottom grate (4) of the brazier slides in guides (7) under the walls (3) of the brazier.

5. Biomass solid fuel stove (1) according to claim 1 or 2 **characterized in that** the connecting means (5,6) through which the bottom grate (4) is connected to the access door (2) are a system of toothed wheels which, when opening the access door (2), turn the bottom grate (4).

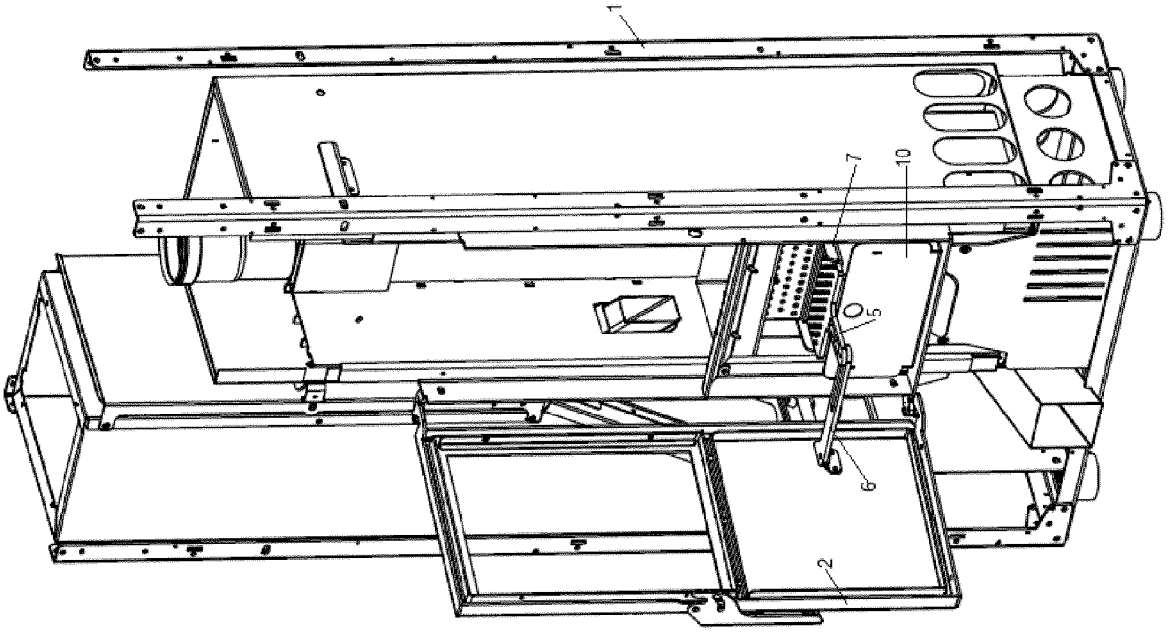

Fig. 2

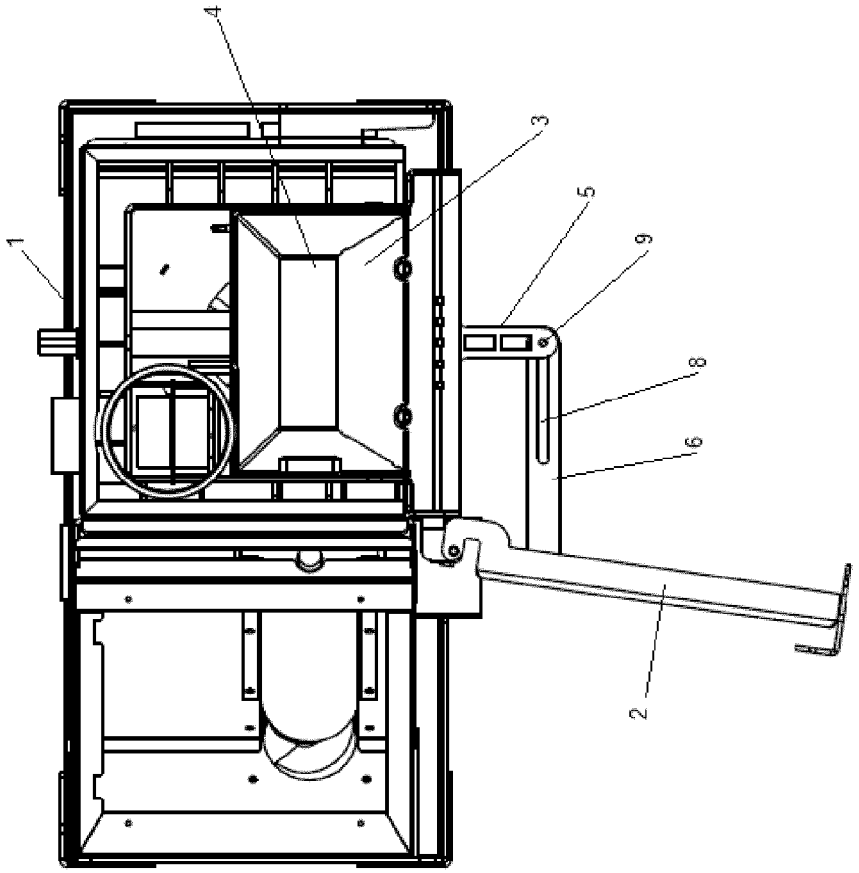

Fig. 1

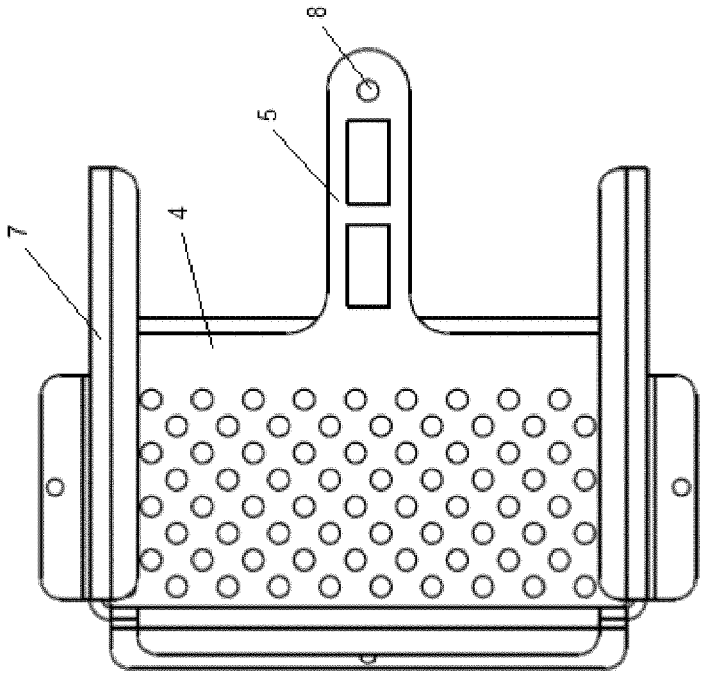

Fig. 3

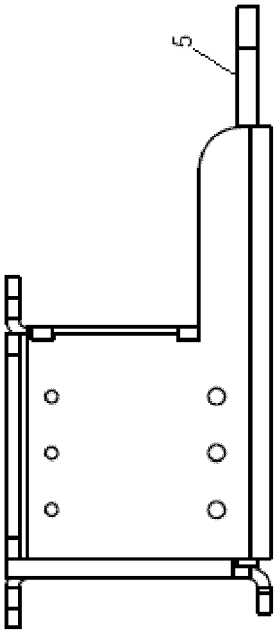

Fig. 5

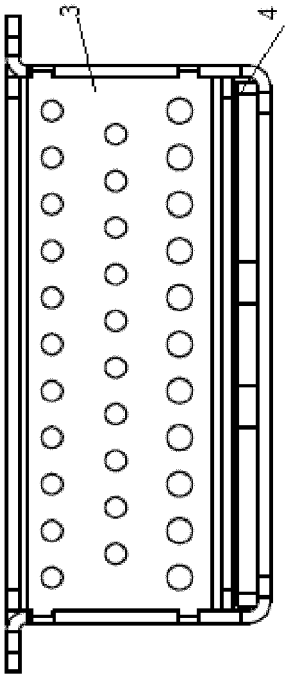

Fig. 4

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EUROPEAN SEARCH REPORT

Application Number
EP 21 20 7434

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	KR 2016 0123846 A (KITURAMI BOILER [KR]) 26 October 2016 (2016-10-26) * paragraphs [0024] - [0069]; figures 4-7b *	1-5	INV. F24B13/02 F23H15/00
Y	AT 87 084 B (SIMMON HANS ING) 25 January 1922 (1922-01-25) * page 1, line 16 - line 23; figure 1 *	1-5	
A	EP 2 592 339 B1 (POSCH HERIBERT [DE]) 28 September 2016 (2016-09-28) * figures *	1	
A	US 4 984 560 A (HAZARD GARY M [US]) 15 January 1991 (1991-01-15) * column 9, line 56 - column 10, line 9; figure 6 *	1-5	
A	KR 2013 0138619 A (KYUNGDONG NAVIEN CO LTD [KR]) 19 December 2013 (2013-12-19) * figures *	1	
			TECHNICAL FIELDS SEARCHED (IPC)
			F24B F23H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	21 March 2022	Verdoodt, Luk

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21-03-2022

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- US 585677 A **[0006]**