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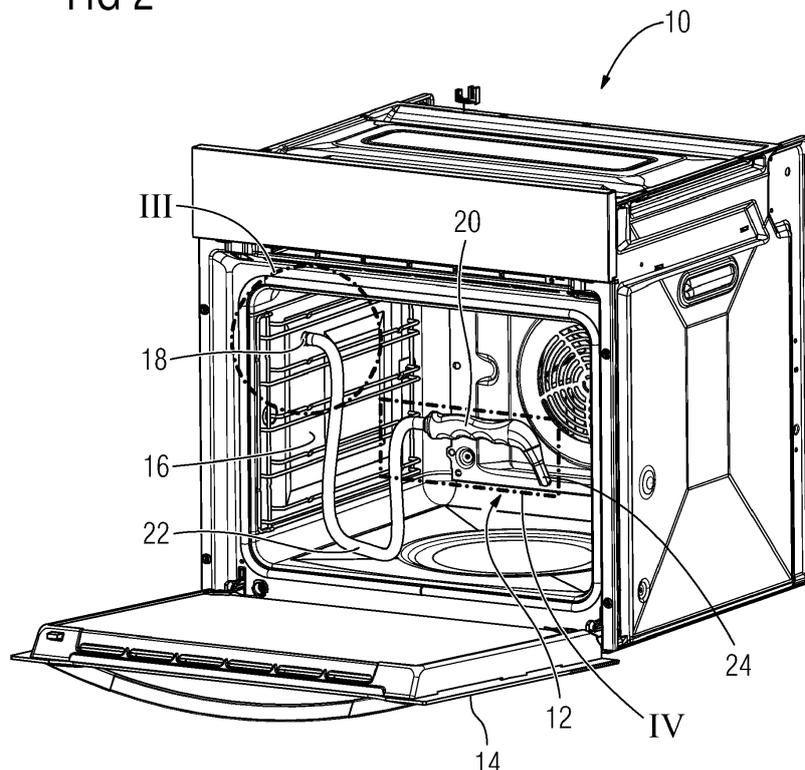
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(54) **A cooking oven with an oven cavity and a cleaning apparatus**

(57) The present invention relates to cooking oven (10) comprising an oven cavity (12) and a cleaning apparatus. The cooking oven (10) comprises a nozzle (18) for providing a cleaning agent. The cleaning apparatus includes a hand set (20) for spraying the cleaning agent. The cleaning apparatus includes a flexible pipe (22) ex-

tended or extendable between the nozzle (18) and the hand set (20). The flexible pipe (22) is provided for conveying the cleaning agent. The nozzle (18) is arranged stationary inside the oven cavity (12), and the flexible pipe (22) is detachably connected or connectable to the nozzle (18).

**FIG 2**



## Description

**[0001]** The present invention relates to a cooking oven comprising an oven cavity and a cleaning apparatus according to the preamble of claim 1. In particular, the present invention relates to a cooking oven with a steam cleaning apparatus.

**[0002]** There are several methods and apparatus for cleaning the oven cavity of a cooking oven. During a pyrolytic cleaning process the oven cavity is heated up to about 500°C in order to ash all residuals from cooking. By a catalytic cleaning process the oven cavity is heated up to about 200°C, so that all residuals from cooking are incinerated. By a steam cleaning process the oven cavity is cleaned by injected steam. For example, the steam is injected into the empty oven cavity, when the oven door is closed.

**[0003]** DE 203 18 233 U1 discloses a cleaning apparatus for a cooking oven. The cleaning apparatus comprises a flexible pipe and a moveable hand set at the one end of said flexible pipe. The other end of the flexible pipe is connected to the cooking oven. The flexible pipe delivers cleaning agent. The hand set sprays the cleaning agent. When the cleaning apparatus is not in use, then the flexible pipe and the hand set are stored in the bottom of the cooking oven. The user may pull-out the hand set with the flexible pipe from the storage space. Since the flexible pipe is biased, the user has to overcome a reset force during pulling out the hand set with said flexible pipe, while the flexible pipe and the hand set are automatically pulled back into the storage space, after the user has released the hand set. The cleaning apparatus requires guide rollers and spring devices for the flexible pipe, so that the mechanism of said cleaning apparatus is very complex.

**[0004]** It is an object of the present invention to provide an improved cooking oven with an oven cavity and a cleaning apparatus, wherein the cleaning apparatus has low complexity.

**[0005]** The object of the present invention is achieved by the cooking oven according to claim 1.

**[0006]** According to the present invention the nozzle is arranged stationary inside the oven cavity, and the flexible pipe is detachably connected or connectable to the nozzle.

**[0007]** The core of the present invention is that the flexible pipe with the hand set is removable from the cooking oven on the one hand and the flexible pipe is detachably lockable inside the oven cavity on the other hand. The flexible pipe may be relative short and requires no additional components. The cooking oven has no complex device for storing the hand set and the flexible pipe. When the cleaning apparatus is not in use, then the hand set and the flexible pipe may be stored out of cooking oven. It is not necessary to provide any storing space inside the cooking oven.

**[0008]** In particular, the cleaning apparatus is a steam cleaning apparatus, the cleaning agent is steam, the nozzle

is a steam nozzle, and the hand set is a steam gun. The steam allows an effective cleaning of the inner sides of the oven cavity and oven door.

**[0009]** For generating the steam the cooking oven may comprise a steam generator arranged inside the cooking oven and connected to the steam nozzle.

**[0010]** In particular, the cooking oven comprises a water reservoir connected to the steam generator.

**[0011]** Further, the steam generator and/or the water reservoir may be connected or connectable to an external water supply. If the steam generator is directly connected to the water supply, then the water reservoir is not implicitly necessary.

**[0012]** Preferably, the nozzle is arranged at an inner side wall of the oven cavity. The nozzle at the inner side wall allows an easy access to said nozzle by the user.

**[0013]** The cleaning apparatus may be provided for cleaning the inner sides of the oven cavity and/or the oven door.

**[0014]** Moreover, the cooking oven may comprise at least one sensor element for detecting, if the flexible pipe is connected to the nozzle.

**[0015]** The hand set may include a jet for distributing the cleaning agent.

**[0016]** In particular, the hand set includes an elongated grip portion.

**[0017]** Preferably, the shape of the grip portion is adapted to the inner side of the human hand.

**[0018]** The axes of the grip portion and the jet may form an obtuse angle.

**[0019]** Preferably, the angle of the axes of the grip portion and the jet is between 120° and 150°.

**[0020]** In particular, the angle of the axes of the grip portion and the jet is between 130° and 140°.

**[0021]** At last, the nozzle and/or the flexible pipe comprise a snap-in mechanism for connecting said flexible pipe to the nozzle.

**[0022]** The novel and inventive features believed to be the characteristic of the present invention are set forth in the appended claims.

**[0023]** The invention will be described in further detail with reference to the drawings, in which

FIG 1 illustrates a perspective view of a cooking oven with an oven cavity and a cleaning apparatus according to a preferred embodiment of the present invention, wherein detachable components of the cleaning apparatus are uninstalled,

FIG 2 illustrates a perspective view of the cooking oven with the oven cavity and the cleaning apparatus according to the preferred embodiment of the present invention, wherein the detachable components of the cleaning apparatus are installed,

FIG 3 illustrates a detailed perspective view of a junction for a flexible pipe at the cooking oven ac-

according to the preferred embodiment of the present invention, and

FIG 4 illustrates a detailed perspective view of the hand set of the cleaning apparatus of the cooking oven according to the preferred embodiment of the present invention.

**[0024]** FIG 1 illustrates a perspective view of a cooking oven 10 with an oven cavity 12 and a cleaning apparatus according to a preferred embodiment of the present invention, wherein detachable components of the cleaning apparatus are uninstalled. The cooking oven 10 comprises an oven door for closing the oven cavity 12.

**[0025]** A steam nozzle 18 is arranged at a side wall 16 on the left hand side of the oven cavity 12. The steam nozzle 18 is connected to a steam generator inside the cooking oven 10. The steam generator is not shown. The steam nozzle 18 feeds the steam for the cleaning apparatus. A flexible pipe 22 of the cleaning apparatus is connectable to the steam nozzle 18.

**[0026]** The steam generator produces the steam by heating water. The water may be provided by a water reservoir inside the cooking oven 10. Alternatively, the water may be provided by an external water supply.

**[0027]** FIG 2 illustrates a perspective view of the cooking oven 10 with the oven cavity 12 and the cleaning apparatus according to the preferred embodiment of the present invention, wherein the detachable components of the cleaning apparatus are installed.

**[0028]** The flexible pipe 22 and a hand set 20 of the cleaning apparatus are installed at the cooking oven 10. The hand set 20 is formed as a steam gun. The one end of the flexible pipe 22 is connected to the steam nozzle 18. The other of the flexible pipe 22 is connected to a rear end of the steam gun 20. Further, the steam gun 20 comprises a jet 24 at its front end. The shape of the steam gun 20 is at least partially adapted to the human hand. Thus, the user can safely grip the steam gun 20. The steam gun 20 and the flexible pipe 22 allow that the user can manually clean the inner sides of the oven cavity 12 and the oven door 14. The user can focusing the jet 24 of the steam gun 20 to the dirty surfaces of the oven cavity 12 and the oven door 14.

**[0029]** When the cleaning apparatus is not in use, then the steam gun 20 and the flexible pipe 22 may be removed from the cooking oven 10, so that the complete oven cavity 12 can be used for cooking purposes. The steam gun 20 and the flexible pipe 22 may be stored out of the cooking oven 10, so that the cooking oven 10 requires no dedicated storing space. However, if the cooking oven 10 comprises sufficient storing space, then the steam gun 20 and the flexible pipe 22 may be stored inside the cooking oven 10. In general, the steam gun 20 and the flexible pipe 22 may be stored in an arbitrary place inside or out of the cooking oven 10.

**[0030]** FIG 3 illustrates a detailed perspective view of a junction for the flexible pipe 22 at the cooking oven 10

according to the preferred embodiment of the present invention. The one end of the flexible pipe 22 is connected to the steam nozzle 18. Said steam nozzle 18 is arranged at the side wall 16 on the left hand side of the oven cavity 12.

**[0031]** In this example, the flexible pipe 22 and the steam nozzle 18 are connected via a plug connection. In general, an arbitrary connector, which is suitable for pipes and steam nozzles, may be used for the connection of flexible pipe 22 to the steam nozzle 18.

**[0032]** Further, the cleaning apparatus includes a sensor for detecting the plug-in connection between the flexible pipe 22 and the steam nozzle 18. Thus, the cleaning apparatus can be activated only, if the flexible pipe 22 is plugged to the steam nozzle 18. For example, the sensor for detecting the plug-in connection may be arranged at or near the steam nozzle 18.

**[0033]** FIG 4 illustrates a detailed perspective view of the steam gun 20 of the cleaning apparatus of the cooking oven 10 according to the preferred embodiment of the present invention. The steam gun 20 includes the jet 24 and an elongated grip portion 24. The grip portion 24 and the jet 24 form an obtuse angle. In this example, the axes of the grip portion 24 and the jet 24 form an angle of about 130°.

**[0034]** The shape of the grip portion 24 of the steam gun 20 is adapted to the human hand, so that the user can safely grip the steam gun 20. The shape of the grip portion 24 allows that the user can safely grip the steam gun 20 during the manual cleaning of the inner sides of the oven cavity 12 and/or the oven door 14.

**[0035]** Although an illustrative embodiment of the present invention has been described herein with reference to the accompanying drawings, it is to be understood that the present invention is not limited to that precise embodiment, and that various other changes and modifications may be affected therein by one skilled in the art without departing from the scope of the invention. All such changes and modifications are intended to be included within the scope of the invention as defined by the appended claims.

#### List of reference numerals

<b>[0036]</b>	
10	cooking oven
12	oven cavity
14	oven door
16	side wall
18	steam nozzle
20	hand set, steam gun
22	flexible pipe
24	jet
26	grip portion

**Claims**

1. A cooking oven (10) comprising an oven cavity (12) and a cleaning apparatus, wherein
- the cooking oven (10) comprises a nozzle (18) for providing a cleaning agent,
  - the cleaning apparatus includes a hand set (20) for spraying the cleaning agent,
  - the cleaning apparatus includes a flexible pipe (22) extended or extendable between the nozzle (18) and the hand set (20), and
  - the flexible pipe (22) is provided for conveying the cleaning agent,
- characterized in that**  
the nozzle (18) is arranged stationary inside the oven cavity (12), and the flexible pipe (22) is detachably connected or connectable to the nozzle (18).
2. The cooking oven according to claim 1,  
**characterized in that**  
the cleaning apparatus is a steam cleaning apparatus, the cleaning agent is steam, the nozzle is a steam nozzle (18), and the hand set is a steam gun (20).
3. The cooking oven according to claim 2,  
**characterized in that**  
the cooking oven (10) comprises a steam generator arranged inside the cooking oven (10) and connected to the steam nozzle (18).
4. The cooking oven according to claim 3,  
**characterized in that**  
the cooking oven (10) comprises a water reservoir connected to the steam generator.
5. The cooking oven according to claim 3 or 4,  
**characterized in that**  
the steam generator and/or the water reservoir are connected or connectable to an external water supply.
6. The cooking oven according to any one of the preceding claims,  
**characterized in that**  
the nozzle (18) is arranged at an inner side wall (16) of the oven cavity (12).
7. The cooking oven according to any one of the preceding claims,  
**characterized in that**  
the cleaning apparatus is provided for cleaning the inner sides of the oven cavity (12) and/or the oven door (14).
8. The cooking oven according to any one of the preceding claims,  
**characterized in that**  
the cooking oven (10) comprises at least one sensor element for detecting if the flexible pipe (22) is connected to the nozzle (18).
9. The cooking oven according to any one of the preceding claims,  
**characterized in that**  
the hand set (20) includes a jet (24) for distributing the cleaning agent.
10. The cooking oven according to any one of the preceding claims,  
**characterized in that**  
the hand set (20) includes an elongated grip portion (26).
11. The cooking oven according to claim 10,  
**characterized in that**  
the shape of the grip portion (26) is adapted to the inner side of the human hand.
12. The cooking oven according to any one of the claims 9 to 11,  
**characterized in that**  
the axes of the grip portion (26) and the jet (24) form an obtuse angle.
13. The cooking oven according to claim 12,  
**characterized in that**  
the angle of the axes of the grip portion (26) and the jet (24) is between 120° and 150°.
14. The cooking oven according to claim 12 or 13,  
**characterized in that**  
the angle of the axes of the grip portion (26) and the jet (24) is between 130° and 140°.
15. The cooking oven according to any one of the preceding claims,  
**characterized in that**  
the nozzle (18) and/or the flexible pipe (22) comprise a snap-in mechanism for connecting said flexible pipe (22) to the nozzle (18).

FIG 1

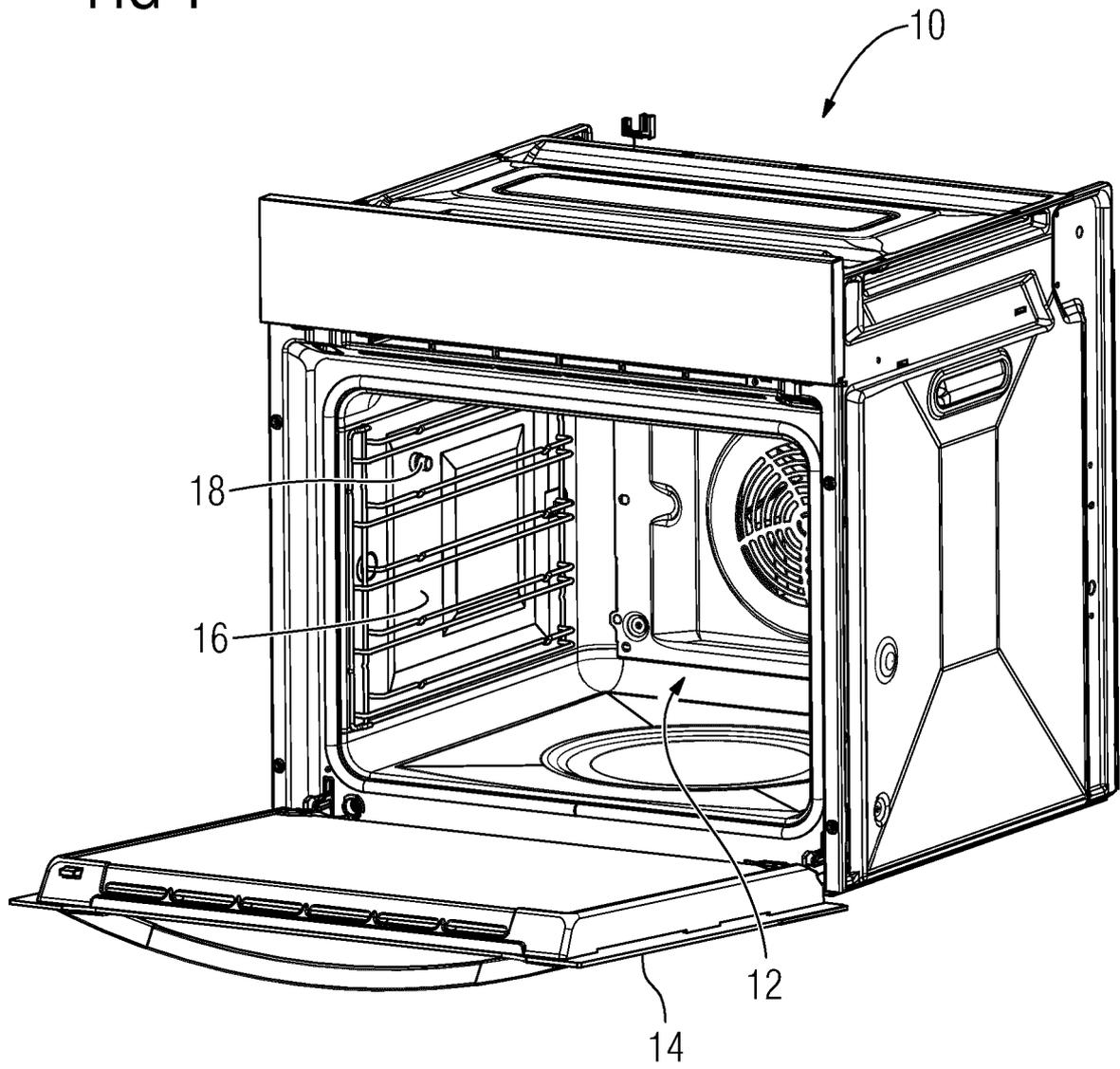




FIG 3

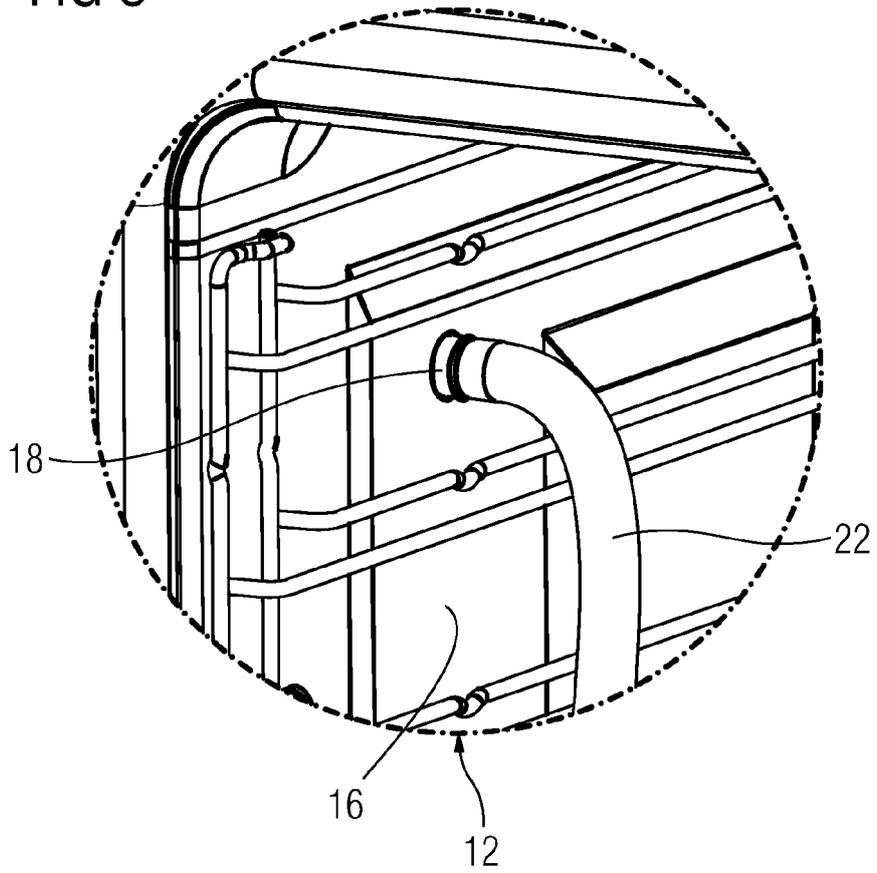
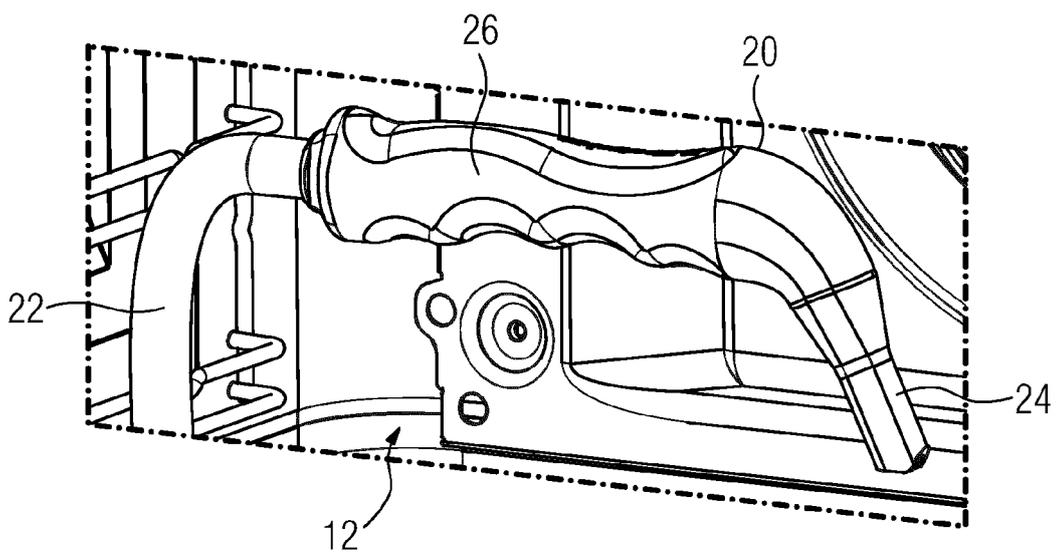


FIG 4





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Application Number  
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<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone                      Y : particularly relevant if combined with another document of the same category                      A : technological background                      O : non-written disclosure                      P : intermediate document</p> <p>T : theory or principle underlying the invention                      E : earlier patent document, but published on, or after the filing date                      D : document cited in the application                      L : document cited for other reasons                      &amp; : member of the same patent family, corresponding document</p>			

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