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(54) **SPIRIT STOVE**

SPIRITUSBRENNER

RECHAUD A ESSENCE

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Description

[0001] This invention relates to a stove preferably for burning alcohol, in particular ethanol and methanol.

[0002] Spirit stoves for burning of ethanol or methanol mixtures without pressure are previously known. A common principle for these apparatus is that the fuel is stored in a container which is filled with a porous mass absorbing the fuel. The container is provided with an opening which faces upwards and from which the fuel evaporates when being burned and a support for cooking utensils is placed above the opening. A more elaborate embodiment of a spirit stove of said type is described in EP 29425. This stove is provided with a box shaped, double base part enclosing a fuel container and a burner, the burner being provided with a vertical burning tube which is placed above the opening of the fuel container, in order to increase the burning condition and hence the efficiency of the stove. The stove is also provided with means for controlling the size of the flame.

[0003] Even if the spirit stoves usually are designed for being simple and reliable, the complexity has gradually increased which is illustrated in said publication. Another example is given in US 4,984,559 disclosing a spirit stove comprising a housing made of two parts which are rotatably connected to each other by a hinge mechanism.

[0004] On the other side simplifying of the design may lead to disadvantageous properties of the stove with respect to the function, in particular concerning burning properties.

From US 4,544,348 A a stove for burning liquid fuel is known with a metal frame having mainly vertical walls continuing into a mainly horizontal hob having one or several fire place parts where the frame encloses a fuel container and a burning arrangement. Here, the frame is formed as a bottomless frame of one piece so as to allow charging and replacing the fuel container from the bottom side of the frame.

Moreover, from EP 0 433 252 A a stove is known having ventilation openings in the side walls to increase or to adjust the amount of air provided to the burner.

The purpose of this invention is to create a stove which is suitable for burning a cheap fuel such as methanol or ethanol in a good and efficient manner and which has certain basic functions, e.g. reliability and ruggedness, but which simultaneously is as simple as possible to operate and to manufacture with a minimum of parts such that the total costs for the stove is reduced. This means that the stove has the possibility to be more spread for use in for instance developing countries where it can replace the stoves which have so far been used and which are heated with wood, dried manure, paraffin oil and so on.

This is achieved by means of an arrangement having the characteristics mentioned in claim 1. Preferable embodiments are subject matter of the dependent claims.

According to the present invention the design of known spirit stoves is simplified by using a cup-like housing up

side down instead of a box-like housing having a lid at the upper side. This simple measure enables a very easy production of the stove with only few parts as well as a simple handling, in particular during charging of the stove with the fuel containers. Due to the bottom-less design, the stove has namely to be turned upside down during charging with the fuel containers. This leads to the additional advantageous effect that fuel which cannot be kept by the fuel absorbing mass is leaving the fuel container. Hence, this surplus fuel which might cause problems during burning is automatically removed during charging. Further, the simple design of the housing or frame, respectively, also enables the provision of simple means to achieve good burning or handling properties, for example a simple and efficient construction of an extinguishing plate, the provision of a channel for conducting combustion air around the fuel containers in order to cool them, a proper design of the flame spreader and the cooking utensil support. Therefore, in particular the combination of all these measures leads to an improved stove which is claimed herein.

Embodiments of the invention will now be described with reference to the enclosed drawings, in which Fig. 1 shows a top plan view of the spirit stove in question, Fig. 2 shows a corresponding plan view of the bottom side, whereas Fig. 3 is a section along the line III-III in Fig. 1 whereas Fig. 4 in a larger scale shows a section through the stove and the fuel container but with another type of cooking utensil support. Fig. 5 is a perspective view of another embodiment of the present invention, Fig. 6 shows details of still a further cooking utensil support, whereas Fig. 7 discloses details of the extinguishing plate used in the embodiment of Fig. 5. Fig. 8 represents details of the flame spreader of the embodiment of Fig. 5.

[0005] The device according to the invention shown in Fig. 1-4 comprises a box shaped, bottomless frame 10. This frame is manufactured in one piece preferably by deep drawing and consists of for instance stainless steel in order to withstand corrosion as far as possible. The frame rests at its lower part on an outwardly flanged foot portion 11 and has a surrounding mainly vertical wall 12 continuing into a horizontal hob 13, the hob comprising an uprising edge portion 14 and a bottom portion 15 placed inside it. The side portions of the vertical wall 12 has several small openings 12a through which combustion air flows into the frame. The bottom portion 15 continues into two step shaped circular uprising parts, each being provided with a first annular step 16 and a second central terrace 17. The annular step 16 has several comparatively small perforations 18 for limiting the heat transmission between the central terrace 17 and the other parts of the frame, whereas the central terrace 17 has several circular openings 19 forming a flame spreader for a burner 20 placed under the hob. Thus, the embodiment shown is a two flame spirit stove, but the invention is of course intended to be used also at stoves having one or more than two flames.

[0006] The frame 10 encloses a mainly U-shaped up-

side-down heat protecting plate 21 that is fixed at the foot portion 11 and that partly surrounds two cylindrical or rectangular fuel containers 22. It should in this connection be mentioned that even if the embodiment shown comprises two cylindrical fuel containers it can be replaced by one single fuel container having a suitable shape. The heat protecting plate 21 that prevents heat radiation from the hob 13 to reach the fuel container 22 (which could cause the fuel to boil in the fuel container) extends along the major part of the length direction of the frame and has two circular openings 23 that are arranged coaxially with respect to the central terraces 17 and that surround an annular edge portion 24 of each fuel container 22 extending up through the opening 23, the edge portion 24 surrounding a central opening 25 of the fuel container. Each fuel container 22 is guided towards the opening 23 by means of several guides 26 punched out of the heat protecting plate these guides being somewhat inclined with respect to a vertical plane. Each fuel container 22 is supported by and is locked to the frame 10 by means of two locking plates 27 turnably arranged about vertically arranged shafts 28, the locking plates to a certain degree being flexibly arranged in the vertical direction by means of a spring washer 29 or the like. The locking plates 27 are kept in their locking positions by means of shoulders 30 arranged at the lower part 31 of the heat protecting plate.

[0007] The heat protecting plate also supports two vertical burner tubes 32, each burner tube being connected to an annular foot plate 33 having several downwardly directed distance means 34 which are fixed close to the peripheries of the openings 23. Further the heat protecting plate 21 supports two arms 35 which are turnably secured about vertical shafts 36, one end of the arms 35 extending through slots 37 arranged in the vertical wall 12 of the frame, whereas the other end of the arms extend between two of the distance means 34 and each support an extinguishing plate 38. The extinguishing plate 38 is circular and arranged to uncover or completely or partly cover the opening 25 of the fuel container 22 by manually controlling the arm 35 from the outside of the frame. The extinguishing plate operates such that it to a larger or a smaller extent, depending on its position, prevents the heat radiation from the flame to reach the opening 25 and hence the surface where the fuel evaporates, which means that the size of the flame is a direct function of the uncovered surface, which means that the size of the flame can easily be controlled.

[0008] The heat protecting plate 21 forms together with the frame 10 a channel 64 between the parallel side walls of the length side. The channel 64 comprises inlet openings 12a, 65 which allow combustion air to be fed to the channel 64 leading the air towards the burner 20. The inlet openings 12a, 65 are disposed in the side walls of the frame as well as of the heat protecting plate 21. In particular, the inlet openings 65 arranged at the side walls of the heat protecting plate 21 causes the air to flow around the fuel container, thereby cooling the same in

order to prevent heating-up and causing boiling of the fuel due to the heat of the flame. Although the embodiment shown in Fig. 3 comprises only inlet openings at the side walls, it is evident that the openings may also be provided for in the bottom of the channel 64.

[0009] The fuel container 22 comprises a circular container with a bottom 39, a side wall part 40 and an upper wall part 41, the upper wall surrounding the opening 25 of the fuel container and continuing into the annular shaped edge portion 24. The bottom 39 has a central inwardly extending depression 42 whereas the upper wall part 41 has a peripheral flange-like upwardly extending, edge portion 43 connecting the upper wall part 41 with the side wall part 40. The fuel container 22 encloses a porous, liquid absorbing mass having a central, cylindrical part 44 and an annular part 45 arranged outside it, the mass being partly covered by a net 46 preventing the mass from falling out from the opening and which is drawn in under the upper wall part 41. When the fuel container is assembled the depression 42 will press the central part upwards with respect to the annular part 45 such that the central part 44 will abut the net 46 which means that an evaporation surface will be created for the fuel in the fuel container in association with the upper part of the fuel container. At the same time the net 46 is clamped between the fuel absorbing mass and the upper wall part 41 comprising notches 73 to form a path for escaping alcohol vapour and liquid alcohol when filling.

[0010] At the embodiment shown in Fig 1-4 two cooking utensil supports 47 are arranged on the upper side of the hob 13. Each cooking utensil support 47 comprises four strip shaped sections 48 that are fixed to one another to an annular structure with a tube shaped circular wind protecting surface 49, several inwardly directed parts 50 and several outwardly extending parts 51, the outwardly extending parts having a vertical extension which is larger than the extension of the wind protecting part such that a lower opening 52 is formed between the bottom portion 15 of the hob 13 and the wind protecting part 49 and an upper opening 53 between the wind protecting part 49 and a cooking utensil placed on the cooking utensil support 47. The lower edges of the inwardly directed parts 50 and the outwardly directed parts 51 are designed such that the shape of the cooking utensil support corresponds to the shape of the hob 13 which means that the cooking utensil support can easily be centered about the central terrace 17.

[0011] At the embodiment shown in Fig 4 the cooking utensil support 47 comprises four radially directed plates 54 having a step shaped lower edge part 55 adapted to the shape of the hob 13, the plates being fixed to a ring 56 surrounding the central terrace.

[0012] It is within the scope of the invention also possible to replace the locking plates 27 with one or several trough shaped collecting boxes which are placed below the fuel containers such that the boxes collect the fuel which might flow out from the fuel container at the same time as the boxes are turnably supported by the frame

and can be locked in a horizontal position and hence press the fuel containers against the heat protecting plate. The advantages of simple design and easy and safe charging of the fuel container is still achieved by an embodiment containing this modification.

[0013] Another embodiment of the present invention corresponding to the previous embodiment except for the details described below is shown in the Fig. 5 to 8.

[0014] Fig. 5 shows the design of the frame 10 of the stove having ventilation openings 12a at all side walls. At the top of the stove the fire place parts comprise different flame spreader 60 and still another embodiment of the cooking utensil support 47. In addition, the frame 10 of this stove is formed to allow stacking of the frames 10 for transport. In particular, the side walls 12 of the frame 10 have at least partially a conical shape.

[0015] As can be seen best in Fig. 6 a) and b), the cooking utensil support 47 consists of three segments 67 to 69 of circle, the ends 70 of which being bent inwards so as to direct radially to the middle of the circle. The segments 67 to 69 are fixed to each other by welding, in particular spot welding of the segment ends 70. The segments are formed of perforated sheet metal so as to allow air flowing to the flame, while preventing wind from disturbing the burning process.

[0016] Fig. 7 shows a detail of the extinguishing plate 38 used in the embodiment represented in Fig. 5. The extinguishing plate 38 comprises a W-shaped annular edge area 71 which improves closing of the opening of the fuel container or the heat protecting plate, respectively, since this structure of the edge area 71 allows a tight closing due to resilient restraint.

[0017] The flame spreader 60 of the embodiment of Fig. 5 is shown in more detail in Fig. 8 a) to c), wherein Fig. 8 a) is a perspective view, Fig. 8 b) is a side view and Fig. 8 c) is a plan view. The flame spreader 60 comprises a U- or Ω -shaped strip for securing to the hob 13 of the frame 10. As part of the strip a screen 63 is formed in order to be placed above the opening 62 of the hob 13 or the burner 20, respectively. The screen divides the flame in several partial flames, while allowing sufficient air to be fed to the flame from the side. Thus, an excellent burning of the flame is achieved.

[0018] The spirit stove operates and is used in the following manner. The spirit stove with the fuel container is turned up side down after which the fuel container is removed and filled with fuel, preferably methanol, by holding it in an inclined position after which the fuel is poured through the opening 25 until the fuel reaches the lower part of the opening 25 where it will be visible when the available mass by capillary forces has sucked up a maximal amount of fuel. The container is then turned up side down (the fuel being kept within the container by said capillary forces) and is inserted from the bottom side of the frame whereby it is directed by the guides 26 such that the edge portion will be inserted through the opening 23 in the heat protecting plate 21. During this procedure any fuel excess in the fuel container will flow out to the

ambient instead of being kept in the fuel container which prevents the fuel from expanding when ignited causing the burning fuel to boil over. When the fuel container has been placed in the frame the locking plates 27 are turned such that they are placed between the shoulders 30 which means that the fuel container is fixed at the frame 10. The stove is then ready to be used by turning the arm 35 which means that the extinguishing plate 38 is moved such that the opening of the fuel container is uncovered. A match can then be inserted through the opening 19 of the flame spreader and ignite the fuel in the container. This means that a flame is created which extends from the net 46 in the opening 25 up through the burner tube 32 and up through the openings of the flame spreader where it is divided into several minor flames spreading out along the bottom side of the cooking utensil. Simultaneously combustion air will flow in through the openings 12a in the side walls which means that the air will flow around the fuel containers and cool them. The small openings 12a, contrary to larger openings, also operate as flame arresters for uncontrolled flames from the burner, which might occur, at the same time as they prevent wind if any from influencing the flame of the burner. At the embodiment shown in Fig 1-3 secondary combustion air flows in via the opening 52 whereas the flame spreading occurs via the opening 53 at the same time as the flames are protected against the wind by means of the wind protecting part 49. The size of the flames can then be controlled by means of the extinguishing plate 38 by acting at the arm 35 and the flames might, after having been used, be extinguished by covering completely the opening 25 of the fuel container 22 with the extinguishing plate.

Claims

1. Stove for burning liquid fuel, in particular alcohol, preferably methanol or ethanol or mixtures thereof, comprising a metal frame (10) having mainly vertical walls (12) continuing into a mainly horizontal hob (13) having one or several fire place parts designed as flame spreaders (19,60), the frame enclosing a fuel container (22) and a burner arrangement (20), wherein the frame (10) is a bottomless frame formed of one piece so as to allow charging and replacing of the fuel container (22) from the bottom side of the frame (10) **characterized in that** the flame spreader (19) is formed integrally with the hob (13), being separated from the remaining parts of the hob (13) by means of an area (16) of perforations (18) surrounding the flame spreader (19).
2. Stove according to claim 1 **characterized in that** the metal frame (10) comprises ventilation openings (12a) to allow combustion air flowing into the frame, the ventilation openings being arranged to define a flow path of the combustion air from the ventilation

openings (12a) to the burner arrangement (20) thereby leading the air around the fuel container (22) in order to cool them.

3. Stove according to claim 1 or 2 **characterized in that** the flame spreader (19) is mainly formed like a truncated cone projecting from the hob (13) and preferably comprising one or more steps (16), the upper side (17) of the cone comprising openings (19) for spreading the flame. 5
4. Stove according to claim 1 or 2 **characterized in that** the fire place part comprises an opening (62) in the hob (13), preferably surrounded by an edge rim or a shoulder (61), and a flame spreader (60) extending in a mainly U-shaped form over the hob opening (62) and having disposed a screen (63) in front of and spaced from the hob opening (62) preferably formed of sheet metal. 10
5. Stove according to claim 4 **characterized in that** the screen (63) mainly has a circular shape, preferably the shape of a four-leafed clover. 15
6. Stove according to any of the preceding claims **characterized in that** the frame (10) also encloses a heat protecting plate (21) arranged between the frame (10) and the fuel container (21). 20
7. Stove according to claim 6 **characterized in that** the heat protecting plate (21) has essentially a U- or Ω -like shaped form, the walls of the heat protecting plate (21) extending substantially parallel to the walls of the frame (10) and being spaced apart from them. 25
8. Stove according to claim 7 **characterized in that** the heat protecting plate (21) and the frame (10) form together a channel (64) for conducting combustion air, the channel preferably extending along the long side of the frame (10) adjacent the fuel container (22) and having inlet openings (12a,65) at the side walls and at the bottom of the channel (64) as well as at least one outlet opening (66) at the top of the channel (64). 30
9. Stove according to any of claims 6 to 8 **characterized in that** the heat protecting plate (21) is provided with at least one opening (23) which is placed vertically below the flame spreader and which surrounds an upwardly extending edge portion (24) of the fuel container the edge portion surrounding an opening (25) in the fuel container (22). 35
10. Stove according to claim 9 **characterized in that** the heat protecting plate (21) supports a vertically positioned burner tube (32) placed between the opening (25) of the fuel container and the flame spreader (19,60). 40
11. Stove according to claim 10 **characterized in that** the burner tube (32) is connected to an annular foot plate (33), the plate being supported by distance means (34) fixed to the heat protecting plate (21). 45
12. Stove according to any of claims 6 to 11 **characterized in that** the heat protecting plate (21) supports at least an arm (35) which is turnable about an axis (36), one end of the arm being provided with an extinguishing plate (38) whereas the other end is placed outside the frame (10), whereby the extinguishing plate can uncover or completely or partly cover the opening (25) of the fuel container or of the heat protecting plate (21). 50
13. Stove according to any of the preceding claims **characterized in that** it is provided with one or several cooking utensil supports (47) arranged to rest on the hob (13) each in association to a fire place part (17), the cooking utensil support comprising a wind protecting hood (49) extending around the flame spreader (19). 55
14. Stove according to claim 13 **characterized in that** the hood (49) has a lower edge which is arranged at a distance from the hob (13) and an upper edge arranged at a distance from the upper part of the cooking utensil support (47).
15. Stove according to claim 13 or 14 **characterized in that** the hood (49) is supported by several radially directed vertical plate shaped parts (50,51).
16. Stove according to any of claims 13 to 15 **characterized in that** the hood (49) is made of a perforated sheet metal forming at the same time the cooking utensil support (47), the hood being manufactured by at least three sections (67,68,69), each of which being shaped as strip-like part of a circle, the ends (70) of the sections (67,68,69) protruding radially towards the middle of the circle and being fixed to each other.
17. Stove according to any of the preceding claims **characterized in that** the fuel container (22) comprises a bottom (39), an upper wall (41) surrounding a central opening (25) of the fuel container and a wall part (40) connecting the bottom and upper wall part, the fuel container also enclosing a fuel absorbing mass comprising at least two separate parts (44,45) one of the parts when assembling the fuel container being moved towards the opening by means of a deformation (42) arranged at the bottom.
18. Stove according to claim 17 **characterized in that** the fuel container (22) comprises a net-like structure (46) disposed at the opening (25) of the fuel container for retaining the fuel absorbing mass, the net-like

structure being clamped between the fuel absorbing mass and notches (73) provided for in the upper wall part (41) of the fuel container.

19. Stove according to any of the preceding claims **characterized in that** it is designed such that the stove is turned up side down when the fuel container is secured to the frame (10).
20. Stove according to claim 12 **characterized in that** the extinguishing plate (38) comprises a circular disc having a W-shaped edge area for safely closing the opening of the fuel contained (22) or the heat-protecting plate (21).

Patentansprüche

1. Herd zum Verbrennen von flüssigem Brennstoff, insbesondere Alkohol, vorzugsweise Methanol oder Ethanol oder Gemische aus diesen, aufweisend einen Metallrahmen (10), der hauptsächlich vertikale Wände (12) aufweist, die sich in einem hauptsächlich horizontalen Kochfeld (13) fortsetzen, das eine oder mehrere Feuerstellenteile aufweist, die als Flammenverteilereinrichtungen (19, 60) gestaltet sind, wobei der Rahmen einen Brennstoffbehälter (22) und eine Brenneranordnung (20) umschließt, wobei der Rahmen einen Boden aufweisenden Rahmen (10) ist, der aus einem einzigen Stück ausgebildet ist, so dass ein Befüllen und Austauschen des Brennstoffbehälters (22) von der Unterseite des Rahmens (10) gestattet wird, **dadurch gekennzeichnet, dass** die Flammenverteilereinrichtung (19) integral mit dem Kochfeld (13) ausgebildet ist, wobei sie von den übrigen Teilen des Kochfeldes (13) mittels einer Zone (16) von Perforationen (18) getrennt ist, welche die Flammenverteilereinrichtung (19) umgeben.
2. Herd nach Anspruch 1, **dadurch gekennzeichnet, dass** der Metallrahmen (10) Lüftungsöffnungen (12a) aufweist, um ein Einströmen von Verbrennungsluft in den Rahmen zu gestatten, wobei die Lüftungsöffnungen so angeordnet sind, dass sie einen Strömungsweg der Verbrennungsluft von den Lüftungsöffnungen (12a) zur Brenneranordnung (20) definieren, wodurch die Luft um den Brennstoffbehälter (22) herumgeleitet wird, um diese zu kühlen.
3. Herd nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** die Flammenverteilereinrichtung (19) hauptsächlich wie ein vom Kochfeld (13) hervorstehender Kegelstumpf ausgebildet ist und vorzugsweise eine oder mehrere Stufen (16) aufweist, wobei die Oberseite (17) des Kegels Öffnungen (19) zum Verteilen der Flamme aufweist.

4. Herd nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** der Feuerstellenteil eine Öffnung (62) im Kochfeld (13), die vorzugsweise von einem Kantenrand oder einer Schulter (61) umgeben ist, und eine Flammenverteilereinrichtung (60) aufweist, die sich im Wesentlichen U-förmig über die Kochfeldöffnung (62) erstreckt und bei der eine Abschirmung (63) vor der vorzugsweise aus Metallblech ausgebildeten Kochfeldöffnung (62) und mit Abstand zu dieser angeordnet ist.
5. Herd nach Anspruch 4, **dadurch gekennzeichnet, dass** die Abschirmung (63) im Wesentlichen kreisförmige Gestalt, und vorzugsweise die Gestalt eines vierblättrigen Kleeblattes aufweist.
6. Herd nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Rahmen (10) auch eine Wärmeschutzplatte (21) aufweist, die zwischen dem Rahmen (10) und dem Brennstoffbehälter (21) angeordnet ist.
7. Herd nach Anspruch 6, **dadurch gekennzeichnet, dass** die Wärmeschutzplatte (21) im Wesentlichen eine U- oder Ω -artige Gestalt aufweist, wobei sich die Wände der Wärmeschutzplatte (21) im Wesentlichen parallel zu den Wänden des Rahmens (10) erstrecken und mit Abstand zu diesen angeordnet sind.
8. Herd nach Anspruch 7, **dadurch gekennzeichnet, dass** die Wärmeschutzplatte (21) und der Rahmen (10) zusammen einen Kanal (64) zum Leiten von Verbrennungsluft bilden, wobei sich der Kanal vorzugsweise entlang der langen Seite des Rahmens (10) benachbart dem Brennstoffbehälter (22) erstreckt und Einlassöffnungen (12a, 65) an den Seitenwänden und an der Unterseite des Kanals 64, sowie mindestens eine Auslassöffnung (66) an der Oberseite des Kanals (64) aufweist.
9. Herd nach einem der Ansprüche 6 bis 8, **dadurch gekennzeichnet, dass** die Wärmeschutzplatte (21) mit mindestens einer Öffnung (23) versehen ist, die vertikal unterhalb der Flammenverteilereinrichtung platziert ist und die einen sich nach oben erstreckenden Kantenabschnitt (24) des Brennstoffbehälters umgibt, wobei der Kantenabschnitt eine Öffnung (25) im Brennstoffbehälter (22) umgibt.
10. Herd nach Anspruch 9, **dadurch gekennzeichnet, dass** die Wärmeschutzplatte (21) ein vertikal positioniertes Brennerrohr (32) trägt, das zwischen der Öffnung (25) des Brennstoffbehälters und der Flammenverteilereinrichtung (19, 60) platziert ist.
11. Herd nach Anspruch 10, **dadurch gekennzeichnet, dass** das Brennerrohr (32) mit einer ringförmigen

Fußplatte (33) verbunden ist, wobei die Platte durch eine Distanzeinrichtung (34) getragen wird, die an der Wärmeschutzplatte (21) befestigt ist.

12. Herd nach einem der Ansprüche 6 bis 11, **dadurch gekennzeichnet, dass** die Wärmeschutzplatte (21) zumindest einen Arm (35) trägt, der um eine Achse (36) schwenkbar ist, wobei das eine Ende des Arms mit einer Auslöschplatte (38) versehen ist, hingegen das andere Ende außerhalb des Rahmens (10) platziert ist, wodurch die Auslöschplatte die Öffnung (25) des Brennstoffbehälters oder der Wärmeschutzplatte (21) freigeben oder diese vollständig oder teilweise verdecken kann. 5
13. Herd nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** er mit einer oder mehreren Kochzubehör-Trägereinrichtungen (47) versehen ist, die so ausgebildet sind, dass sie auf dem Kochfeld (13) jeweils in Zugehörigkeit zu einem Feuerstellenteil (17) aufsitzen, wobei die Kochzubehör-Trägereinrichtung eine Windschutzhaube (49) aufweist, die sich um die Flammenverteilereinrichtung (19) herum erstreckt. 10
14. Herd nach Anspruch 13, **dadurch gekennzeichnet, dass** die Haube (49) eine Unterkante, die in einem Abstand zum Kochfeld (13) angeordnet ist, und eine Oberkante aufweist, die in einem Abstand zum Ober- 20 teil der Kochzubehör-Trägereinrichtung (47) angeordnet ist.
15. Herd nach Anspruch 13 oder 14, **dadurch gekennzeichnet, dass** die Haube (49) durch mehrere, in radialer Richtung gerichtete vertikale plattenförmige Teile (50, 51) getragen wird. 25
16. Herd nach einem der Ansprüche 13 bis 15, **dadurch gekennzeichnet, dass** die Haube (49) aus einem perforierten Metallblech besteht, das gleichzeitig die Kochzubehör-Trägereinrichtung (47) bildet, wobei die Haube aus mindestens drei Teilstücken (67, 68, 69) gefertigt ist, von denen jedes als streifenartiges Teil eines Kreises geformt ist, wobei die Enden (70) der Teilstücke (67, 68, 69) radial zur Mitte des Kreises hin hervorstehen und aneinander befestigt sind. 30
17. Herd nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** der Brennstoffbehälter (22) einen Boden (39), eine obere Wand (41), welche eine mittige Öffnung (25) des Brennstoffbehälters umgibt, und einen Wandteil (40) aufweist, welcher den Boden und den oberen Wandteil verbindet, wobei der Brennstoffbehälter auch eine Brennstoff absorbierende Masse einschließt, die 35 mindestens zwei separate Teile (44, 45) beinhaltet, wobei beim Zusammenbau des Brennstoffbehälters eines der Teile mittels einer am Boden angeordneten

Verformung (42) zur Öffnung hin bewegt wird.

18. Herd nach Anspruch 17, **dadurch gekennzeichnet, dass** der Brennstoffbehälter (22) eine netzartige Struktur (46) aufweist, die an der Öffnung (25) des Brennstoffbehälters angeordnet ist, um die Brennstoff absorbierende Masse zurückzuhalten, wobei die netzartige Struktur zwischen der Brennstoff absorbierenden Masse und Kerben (73) festgeklemmt ist, die im oberen Wandteil (41) des Brennstoffbehälters vorgesehen sind. 40
19. Herd nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** er derart gestaltet ist, dass der Herd auf den Kopf gestellt wird, wenn der Brennstoffbehälter am Rahmen (10) befestigt wird. 45
20. Herd nach Anspruch 12, **dadurch gekennzeichnet, dass** die Auslöschplatte (38) eine kreisförmige Scheibe aufweist, die eine W-förmige Kantenzone aufweist, um die Öffnung des Brennstoffbehälters (22) oder der Wärmeschutzplatte (21) zu verschließen. 50

Revendications

1. Réchaud pour brûler du combustible liquide, en particulier de l'alcool, de préférence du méthanol ou de l'éthanol ou leurs mélanges, comprenant un châssis métallique (10) ayant des parois principalement verticales (12) se prolongeant en une plaque principalement horizontale (13) ayant une ou plusieurs parties de foyer conçues comme des diffuseurs de flamme (19, 60), le châssis contenant un récipient de combustible (22) et un agencement de brûleur (20), dans lequel le châssis (10) est un châssis sans fond formé d'une pièce afin de permettre le chargement et le remplacement du récipient de combustible (22) par le côté inférieur du châssis (10), **caractérisé en ce que** le diffuseur de flamme (19) est formé de manière solidaire avec la plaque (13), qui est séparé des parties restantes de la plaque (13) au moyen d'une zone (16) de perforations (18) entourant le diffuseur de flamme (19). 55
2. Réchaud selon la revendication 1, **caractérisé en ce que** le châssis métallique (10) comprend des ouvertures de ventilation (12a) pour permettre la combustion de l'air circulant dans le châssis, les ouvertures de ventilation étant agencées pour définir une trajectoire d'écoulement de l'air de combustion des ouvertures de ventilation (12a) jusqu'à l'agencement de brûleur (20) amenant ainsi l'air autour du récipient de combustible (22) afin de les refroidir.
3. Réchaud selon la revendication 1 ou 2, **caractérisé**

- en ce que** le diffuseur de flamme (19) est principalement formé comme un cône tronqué faisant saillie de la plaque (13) et comprenant de préférence un ou plusieurs échelons (16), le côté supérieur (17) du cône comprenant des ouvertures (19) pour diffuser la flamme.
4. Réchaud selon la revendication 1 ou 2, **caractérisé en ce que** la partie de foyer comprend une ouverture (62) dans la plaque (13), entourée de préférence par un bord ou un épaulement (61), et un diffuseur de flamme (60) s'étendant selon une forme principalement en U sur l'ouverture de plaque (62) et ayant disposé un écran (63) en face et espacé de l'ouverture (62) de plaque formée de préférence avec une tôle métallique.
5. Réchaud selon la revendication 4, **caractérisé en ce que** l'écran (63) a principalement une forme circulaire, de préférence la forme d'un trèfle à quatre feuilles.
6. Réchaud selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le châssis (10) contient également une plaque de protection contre la chaleur (21) agencée entre le châssis (10) et le récipient de combustible (21).
7. Réchaud selon la revendication 6, **caractérisé en ce que** la plaque de protection contre la chaleur (21) a essentiellement une forme de U ou Ω , les parois de la plaque de protection contre la chaleur (21) s'étendant sensiblement parallèlement aux parois du châssis (10) et étant espacées de celles-ci.
8. Réchaud selon la revendication 7, **caractérisé en ce que** la plaque de protection contre la chaleur (21) et le châssis (10) forment ensemble un canal (64) pour la conduction de l'air de combustion, le canal s'étendant de préférence le long du côté longitudinal du châssis (10) adjacent au récipient de combustible (22) et ayant des ouvertures d'entrée (12a, 65) au niveau des parois latérales et au fond du canal (64) ainsi qu'au moins une ouverture de sortie (66) au niveau de la partie supérieure du canal (64).
9. Réchaud selon l'une quelconque des revendications 6 à 8, **caractérisé en ce que** la plaque de protection contre la chaleur (21) est prévue avec au moins une ouverture (23) qui est placée verticalement au-dessous du diffuseur de flamme et qui entoure une partie de bord (24) s'étendant vers le haut du récipient de combustible, la partie de bord entourant une ouverture (25) dans le récipient de combustible (22).
10. Réchaud selon la revendication 9, **caractérisé en ce que** la plaque de protection contre la chaleur (21) supporte un tube de brûleur (32) positionné verticalement, placé entre l'ouverture (25) du récipient de combustible et le diffuseur de flamme (19, 60).
11. Réchaud selon la revendication 10, **caractérisé en ce que** le tube de brûleur (32) est raccordé à une plaque de pied annulaire (33), la plaque étant supportée par des moyens de distance (34) fixés à la plaque de protection contre la chaleur (21).
12. Réchaud selon l'une quelconque des revendications 6 à 11, **caractérisé en ce que** la plaque de protection contre la chaleur (21) supporte au moins un bras (35) qui peut tourner autour d'un axe (36), une extrémité du bras étant dotée d'une plaque d'extinction (38) alors que l'autre extrémité est placée à l'extérieur du châssis (10), moyennant quoi la plaque d'extinction ne peut pas couvrir ou complètement ou partiellement l'ouverture (25) du récipient du combustible ou de la plaque de protection contre la chaleur (21).
13. Réchaud selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** est doté d'un ou de plusieurs supports d'ustensile de cuisine (47) agencés pour reposer sur la plaque (13), chacun en association avec une partie de foyer (17), le support d'ustensile de cuisine comprenant un capot de protection contre le vent (49) s'étendant autour du diffuseur de flamme (19).
14. Réchaud selon la revendication 13, **caractérisé en ce que** le capot (49) a un bord inférieur qui est agencé à une certaine distance du moyeu (13) et un bord supérieur agencé à une certaine distance de la partie supérieure du support d'ustensile de cuisine (47).
15. Réchaud selon la revendication 13 ou 14, **caractérisé en ce que** le capot (49) est supporté par plusieurs parties en forme de plaque verticale (50, 51) dirigées de manière radiale.
16. Réchaud selon l'une quelconque des revendications 13 à 15, **caractérisé en ce que** le capot (49) est réalisé avec une tôle perforée formant en même temps le support d'ustensile de cuisine (47), le capot étant fabriqué par au moins trois sections (67, 68, 69) dont chacune est formée comme une partie en forme de bande d'un cercle, les extrémités (70) des sections (67, 68, 69) faisant saillie radialement vers le milieu du cercle et étant fixées entre elles.
17. Réchaud selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le récipient de combustible (22) comprend un fond (39), une paroi supérieure (41) entourant une ouverture centrale (25) du récipient de combustible et une partie de la paroi (40) raccordant le fond et la partie de paroi supérieure, le récipient de combustible enfermant

également une masse d'absorption de combustible comprenant au moins deux parties séparées (44, 45), l'une des parties lorsqu'elle est assemblée au récipient de combustible, est déplacée vers l'ouverture au moyen d'une déformation (42) agencée au fond. 5

18. Réchaud selon la revendication 17, **caractérisé en ce que** le récipient de combustible (22) comprend une structure en forme de filet (46) disposée à l'ouverture (25) du récipient de combustible pour retenir la masse d'absorption de combustible, la surface en forme de filet étant bloquée entre la masse d'absorption de combustible et des encoches (73) prévues dans la partie de paroi supérieure (41) du récipient de combustible. 10 15

19. Réchaud selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** est conçu de sorte que le réchaud est retourné lorsque le récipient de combustible est fixé au châssis (10). 20

20. Réchaud selon la revendication 12, **caractérisé en ce que** la plaque d'extinction (38) comprend un disque circulaire ayant une surface de bord en forme de W pour fermer en toute sécurité l'ouverture du combustible contenu (22) ou de la plaque de protection contre la chaleur (21). 25

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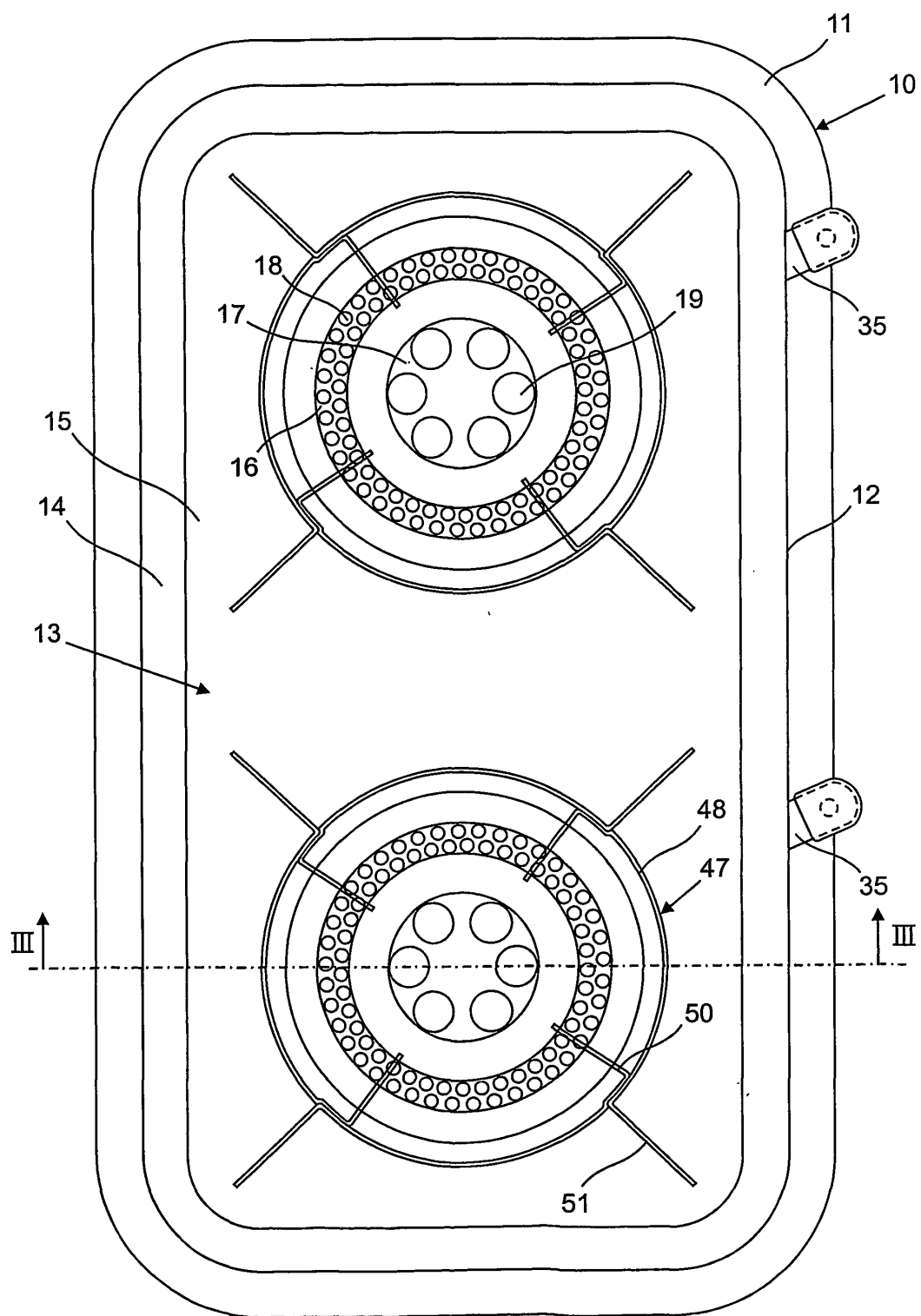


Fig. 1

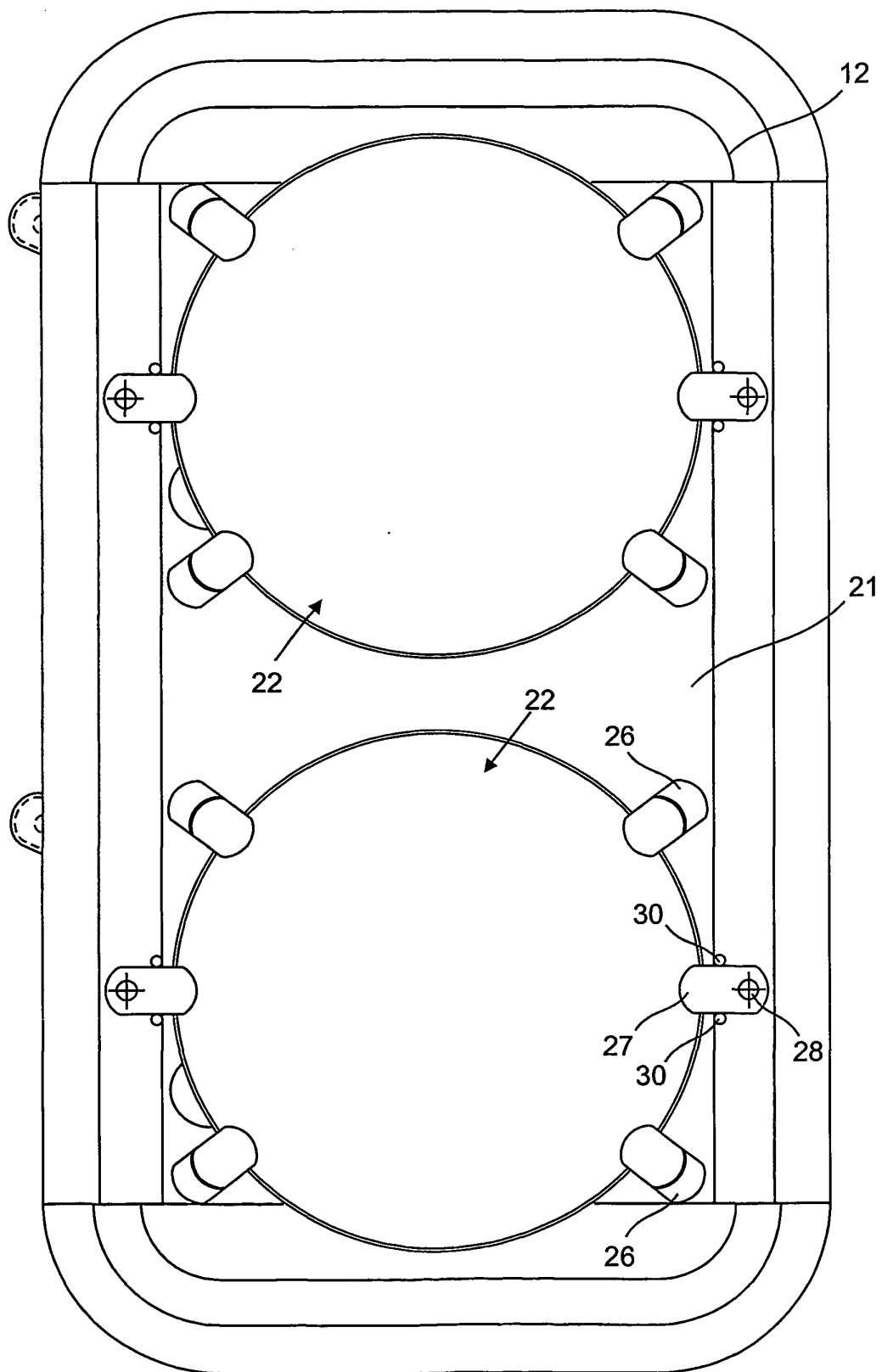


Fig. 2

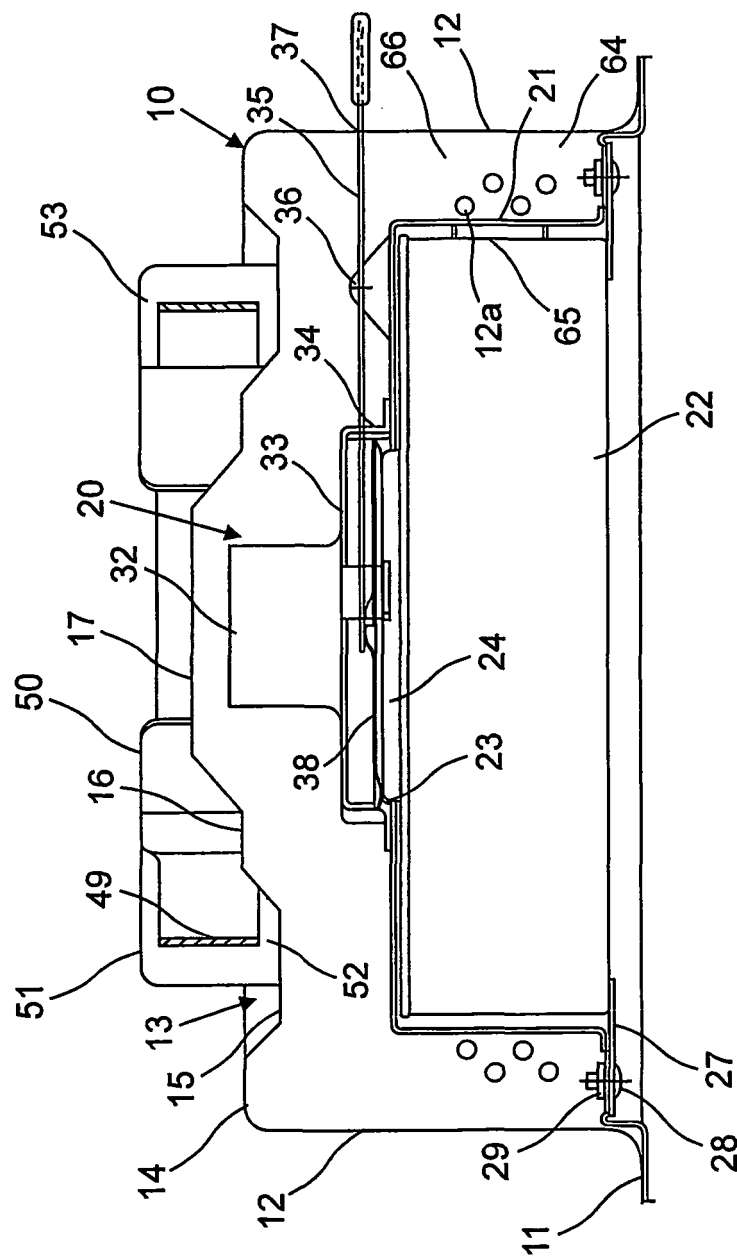


Fig. 3

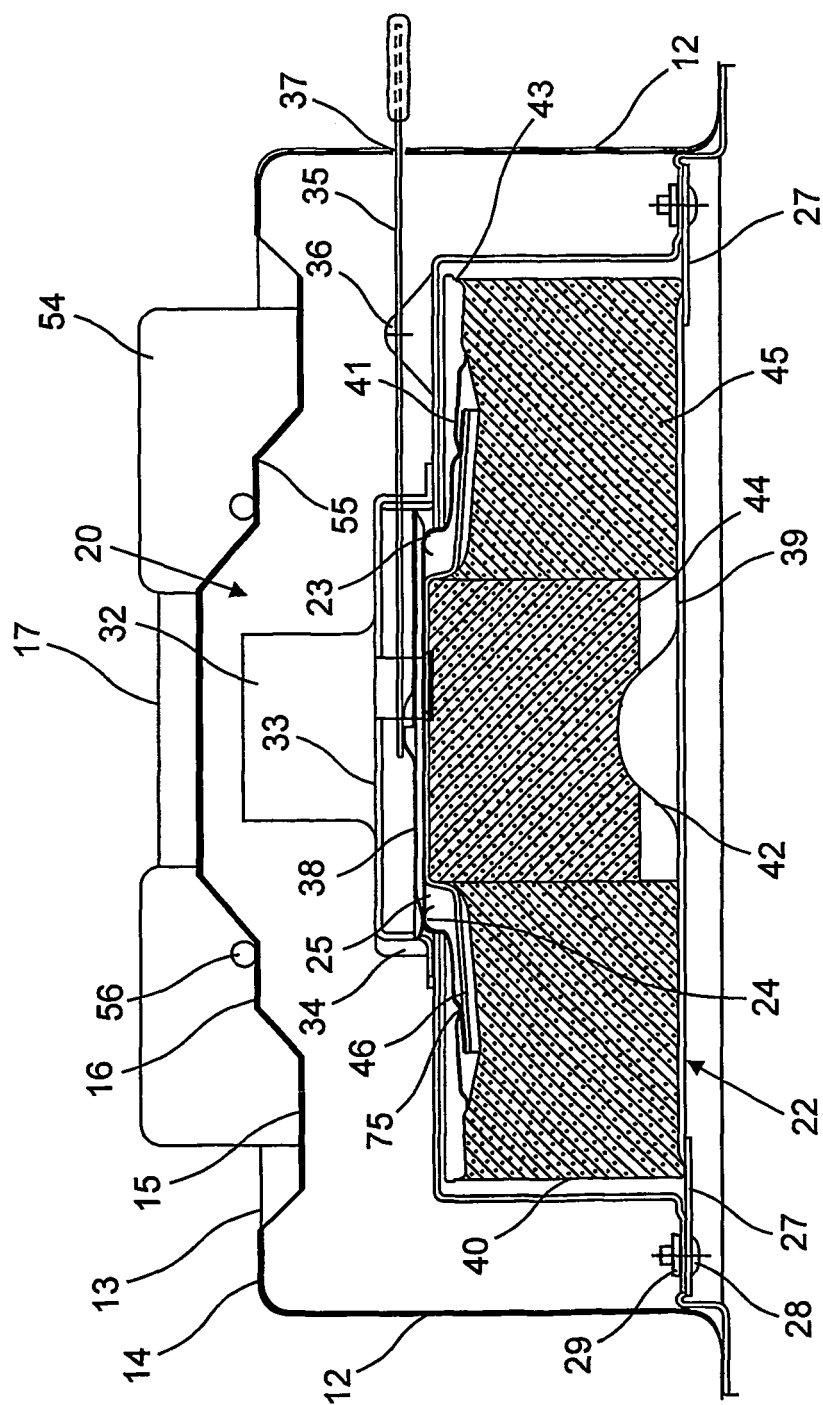


Fig. 4

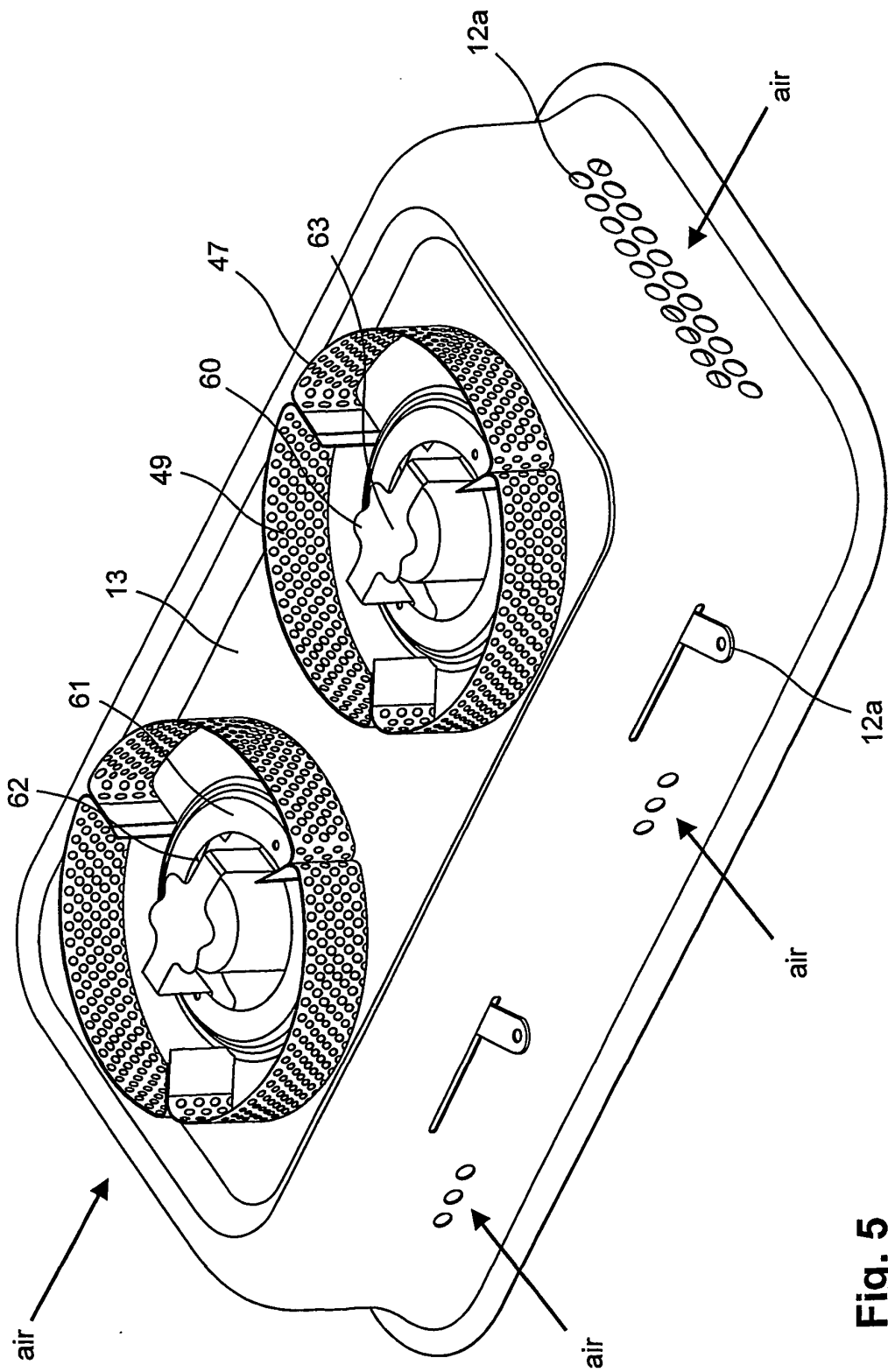


Fig. 5

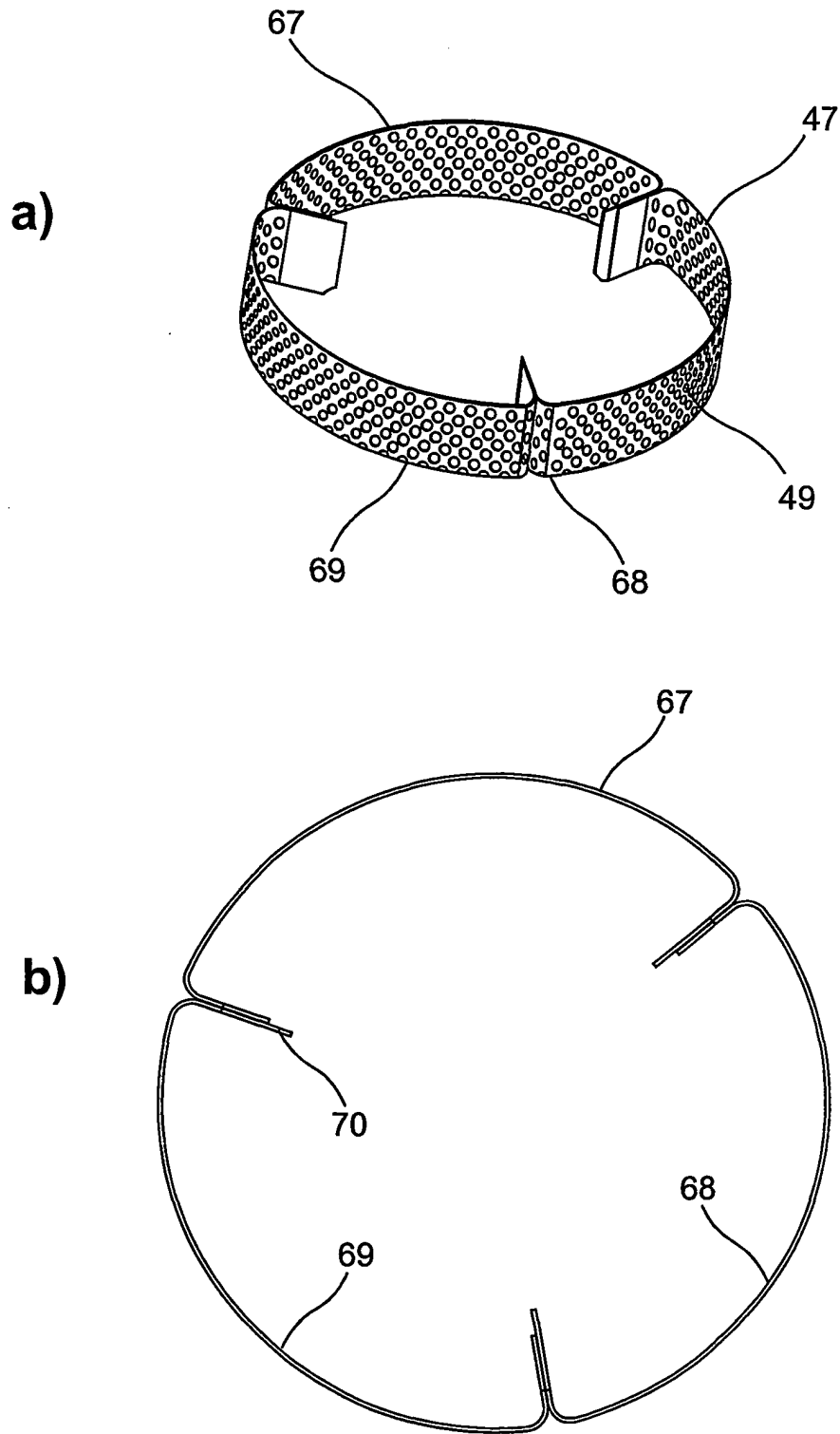


Fig. 6

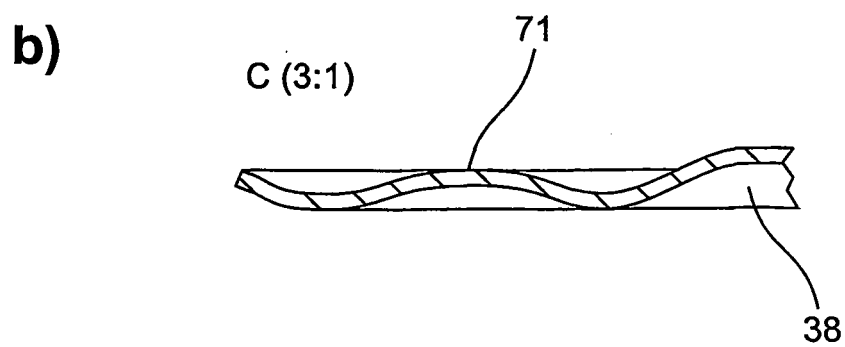
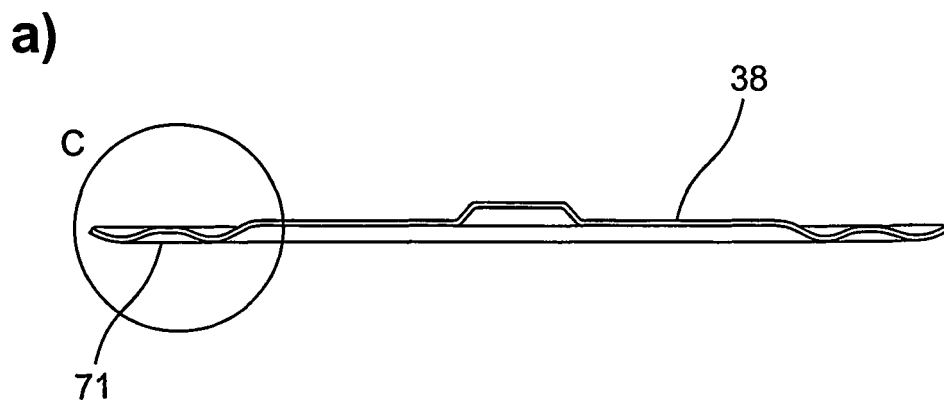
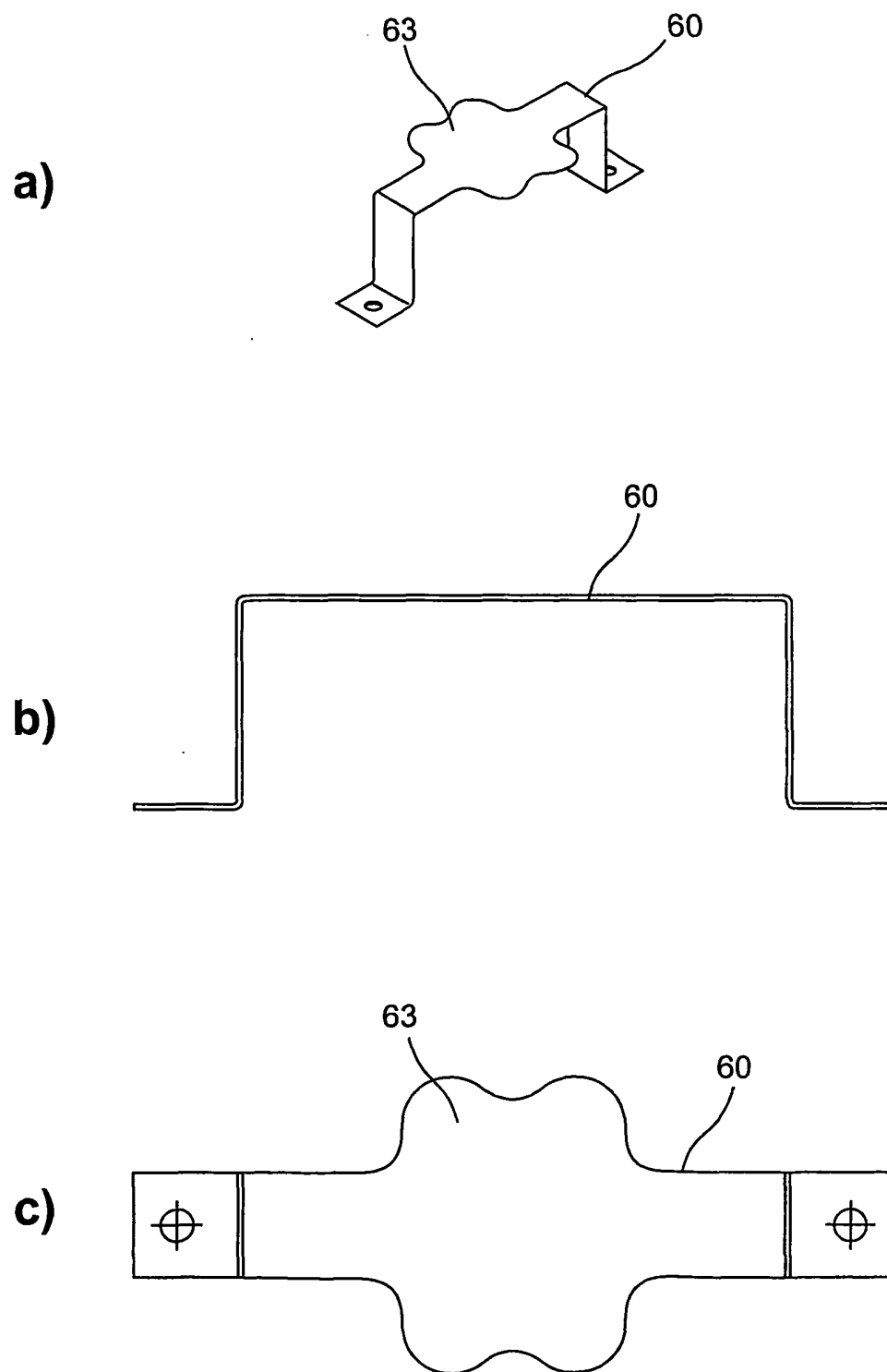


Fig. 7



REFERENCES CITED IN THE DESCRIPTION

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