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(71) Applicant: **ALGA DI GIUDICI ANGELAMARIA & C. S.n.c.**
Via Broseta, 59
I-24100 Bergamo(IT)

(72) Inventor: **Giavazzi, Giancarlo**
Via Broseta 59
I-24100 Bergamo(IT)

(74) Representative: **La Ciura, Salvatore**
Via Francesco Sforza 3
I-20122 Milan(IT)

(54) Oven for cooking foods with tungsten halogen lamps.

(57) An oven for cooking foods, electrically by fed, substantially shaped like a parallelepiped with a front door (2) closing a cooking space, above and below the cooking floor being disposed normal tungsten halogen lamps for lighting purpose (8) placed in suitable reflectors (9) having in section an edged behaviour showing reflecting surfaces (18) shaped as an orange peel.

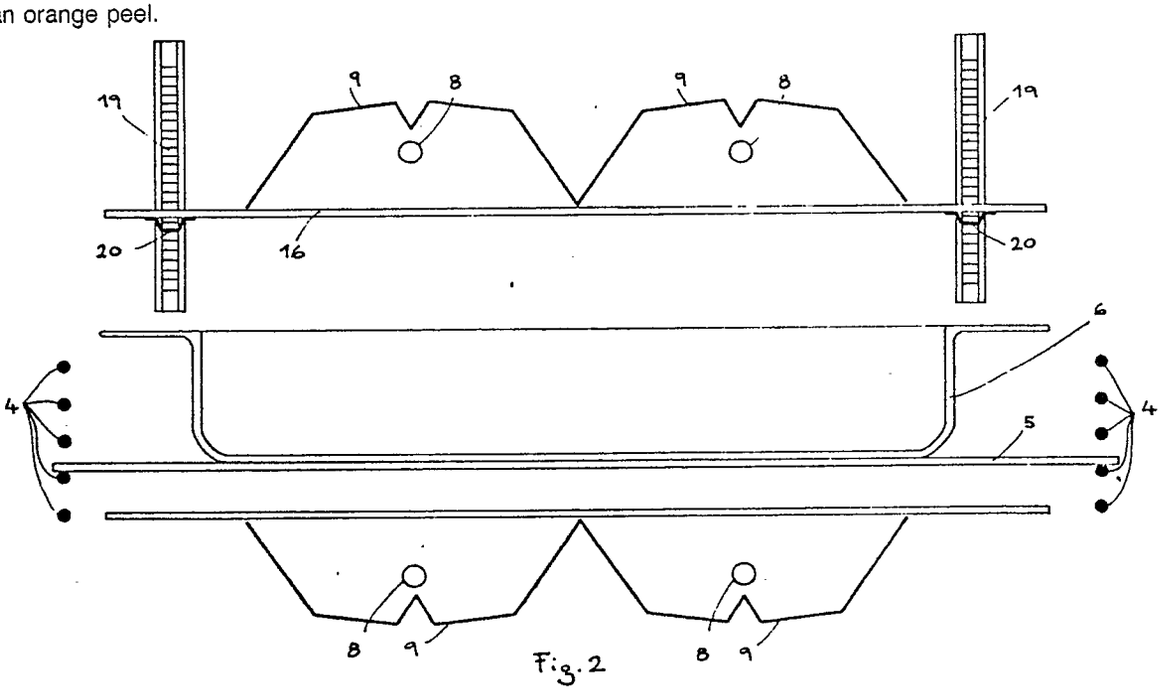

Fig. 2

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OVEN FOR COOKING FOODS WITH TUNGSTEN HALOGEN LAMPS.

The present invention relates to an oven particularly cooking foods, using tungsten halogen lamps of the type used for lighiting purpose.

At the state of the art cooking ovens are already well known in which conventional heating systems, for instance gas or electrical resistors, are replaced by radiant elements, for instance microwaves or infrared rays.

In these ovens it has also been proposed to use, as heating elements, tungsten halogen lamps intentionally designed to emit prevalently inforared rays or to operate with filters that are prevalently passed throught by infrared radiations.

These tungsten halogen infrared lamps are very expensive, have large dimensions, special caps, and can be with difficulty found in ordinary shops or supermarkets.

In accordance with the present invention, the cooking oven, shaped as a parallelepiped wiht opening front door, is provided above and below the cooking floor hob with at least a relevant tungsten halogen lamp like that normally used for lighting purpose arranged in a relevant reflector.

It has been found that by using common tungsten halogen lamps for lighting purpose, i.e. taking profit of all the enmission spectrum typical of these lamps, excellent results in the meals preparation are got.

Therefore the advantages related to the use of normal tungsten halogen lighting purpose lamps, namely very low cost, limited dimensions, semplicity of mounting, easy evailability on the market, are added to the typical advantages of radioting lamps in respect to the conventional cooking systems, as for instance reduction or elimination of the use of fat condiments, keeping the natural taste of the food, reduction of emission of bad smells.

Then, in case of failure of such a lamp, the user can easily replace it personally and without tools.

Preferably, the upper reflectors placed above the cooking floor hob and thus the lamps therein accomodated, can be regulated in height, in order to obtain the maximum field intensity in respect to the shape and type of food.

According to the invention, the reflectors mounting the tungsten halogen for lighting purpose lamps, show on the bottom a "V" shaped fold with the vertex faced to the lamps, in order to avoid the return of the reflected rays on the lamps themselves, that could cause their overheating.

Such raflectors also have a geometric shape of edged behaviour showing the reflecting surface as an orange peel, got normally from embassed aluminium.

In such a way, in addition to the direct radiation on the food a radiation coming from multiple reflections with casual behaviour have to be continued. This leads to a scattering of the rays, and thus to a better uniformity in the distribution of the same rays on the food to be cooked.

On the front of the enclosure of the oven two control knobs are placed; the first one belongs to a timer to fix the cooking time and the second one to a switch/regulator to select the lighting of the tungsten halogen lamps and to regulate their power.

In addition a microswitch is placed in correspondence to the edge of the front door in order to disconnect automatically the electrical supply of the lamps, as the door is opened, so avoiding troublesome dazzlings.

The door is made, at least partially, of translucent material, but screened against luminous rays, to avoid dazzling during the operation of the oven.

Further features of the invention will appear much more evident from the herein after detailed description referred to a preferred embodiment, shown in the annexed drawings, in which:

- figure 1 is an assonometric schematic view of the cooking oven in accordance with the invention, shown in the open position;

-figure 2 is a schematic median section of the cooking space of the oven of figure 1;

-figure 3 is an assonometric partial view of a reflector lodging a tungsten halogen lamp, and schematically showing a part of its reflecting surface shaped as an orange peel.

With reference to such figures, reference numeral 1 indicates as a whole the cooking oven in accordance with the invention.

It has a basically parallelepiped shape and shows a front door 2 that closes a cooking space 3, provided with some lateral opposed ribs 4 placed at different heights, for the support of a metallic grid or of a transparent glass plate 5 acting as a bearing hob for instance of a food container 6, also in transparent material (see fig. 2).

Also a spit (not shown) can be obviously placed in the cooking space 3.

Above and below the cooking floor hob, some tungsten halogen lamps 8, electrically fed and mounted in suitable reflectors 9 are settled, as it will better be described later on.

In figure 1, it is schematically shown the electric cord 10 of the oven 1, with a plug 11 at the free end.

In correspondence with the fore edge of a lateral wall of the oven 1, a microswitch 12 is placed, that, pushed by the front door 2, keeps

closed the electric circuit of the electric supply when the door is closed, whereas it opens such a circuit as the door is opened, avoiding troublesome dazzlings.

The door 2, provided with a handle for grasping 7, has at least an intermediate part 15 in translucent material, but screened against luminous rays, to avoid dazzling during the operation of the oven.

On the frontal part of oven 1,at the side of the door there is allocated a knob 13 of a timer to fix the proper cooking time for each food, and also a knob 14 of a switch/regulator that selects the lighting of the tungsten halogen lamps 8, and controls their power.

With reference to the figures 2 and 3 the cooking space of the oven is now described in more details.

As already said, above and below the hob of the cooking floor, the tungsteen halogen lamps 8 are accomodated (two in the exemple referred in the annexed figures) positioned in suitable casing reflectors 9.

On each couple of the uepper and lower reflectors transparent glass plate 16 is placed, that has no influence on the radiation spectrum of the tungsten halogen lamps and acts as a protection for such lamps and for the reflecting surfaces of the reflectors 9.

The upper reflectors 9, and therefore the relevant tungsten halogen lamps, are regulated in height in the oven space 3, by for instance, toothed slices 19 to which stop gears 20 bound to the reflectors 9 are connected, as schematically shown in fig. 3.

The height regulation of the upper reflectors 9 permits to get the maximum field intensity in respect to the shape and time of the food to be cooked.

The tungsten halogen lamps 8 are normal lighting lamps thus advantage is taken of their full radiation spectrum, that also includes the visible part.

The reflectors 9 show in section (see fig. 2) a geometric shape of edged behaviour, and have on the bottom a "V" shaped simmetric fold 17 with the vertex at the side of the lamp itself, in order to avoid the return of the reflected rays on the lamp, taht could cause its over heating, and consequently a premature lamp life end.

Internal reflecting surface of the reflectors 9 has a geometric shape of edged behaviour like an orange peel 18, as schematically seen in figure 3, and it is got, for instance, from embossed aluminium.

The geometry of the reflectors 9 and the particular conformation of their reflecting surface 18 lead to a scattering of the rays emitted from the lamps 8, and thus to a better uniformity in distribution of the same on foods to be cooked.

It has been realized that excellent cooking results are obtained using the normal tungsten halogen lamps for lighting purpose instead of the infrared tungsten halogen lamps which are much more expensive; advantage is also drived from the geometry of the reflectors 9 and from the conformation of their reflecting surfaces 18.

A surprising performance of the appliance is the treatment of the frozen foods, for which the defrosting time is shorter than that of a microweve oven, comparable for power and size.

In addition tungsten halogen lighting purpose lamps 8 have low cost and limited dimensions; they are largely available in the ordinary shops and supermarkets, they are easily mountable so the user can personally replace them without tools in case of failure, or taken down for eventual cleaning.

It is obvious that no other lamps is necessary inside the oven, to check visually the cooking process through the transparent front door.

Further advantages obtained from the use of such types of lamps, are the very low thermal inertness of the heating system that allows at the moment of the lighting of the lamps, to reach immediately the steady conditions of the appliance and consequently a considerable reduction of the cooking times.

Naturally, the cooking oven in accordance with the invention, is not limited to the particular form of realisation previously described and illustrated in the annexed drawings, but modifications to it can be brought in the details without getting out from the ambit of the same invention.

Two interesting combinations of this oven with existing appliances are now described:

1) Browning elements are introduced into the cavity of known microweve ovens to improve the appearence of the cooked food.

This can be done according to the invention by using the tungsten halogen for lighting purpose lamps accomodated in the oven previously described, only by increasing the distance between the two reflectors 9 of the upper couple.

In the spacing so obtained, the antenna and the stirrer are placed to distribute adeguately the microwavs generated in a magnetron (non shown in figure 1 situated beyond the knobs of the timer and the switch/regulator as laid down in a ordinary microwave oven).

The cooking space of the oven is not the cavity, where the food is cooked by the combination of microwave and luminous energies.

Regulation is always made with the knobs of the timer 13 and the switch 14.

Usual precautionary measures are taken to avoid energies leakage from the cavity.

2) Sterilization of surgical tools is carried out in autoclaves often combined to ultraviolet germicidal lamps.

The same results can be reached in the oven of this invention in a quicker way simply replacing one or even two reflectors and their tungsten halogen lighting purpose lamps of the upper couple with ultraviolet rays germicidal lamps. Consequently the combined action of both heath and germicidal rays, destroys virus and bacteria.

Regulation is always made with the knobs of the timer 13 and the switch 14 whereas a ultraviolet filter is added on the translucent material of the front door.

Claims

1. Oven for cooking foods, electrically fed, substantially shaped like a parallelepiped with a front, door (2) closing a cooking space (3) characterized in that above and below the hob of the cooking floor there are disposed normal tungsten halogen lamps for lighting purpose (8) placed in suitable reflectors (9), utilizing, during the cooking; the full radiation spectrum of the tungsten halogen lamps for lighting purpose.

2. Oven as claimed in claim 1, wherein such reflectors (9) have a geometric shape of edged behaviour and have on the bottom a relevant "V" shaped fold with the verte faced to the relevant lamp (8), in order to avoid the return of reflected rays on the lamps themselves.

3. Oven as claimed in claim 1 or 2, wherein the internal reflecting surface (18) of reflectors (9) is shaped as an orange peel.

4. Oven as claimed in claim 3 wherein the orange peel shape of reflecting surface (18) is got from embassed aluminium.

5. Oven as claimed in any preceding claim, wherein at least in front to the reflectors (9) accomodated above the cooking floor, a transparent glass plate (16) is placed, with no influence on the radiated spectrum of the tungsten halogen lighting lamps (8).

6. Oven as claimed in any preceding claim, wherein at least the upper reflectors (9) and the relevant tungsten halogen lamps (8) are regulable in height.

7. Oven as claimed in any preceding claim, wherein a microswitch (12) cooperating with the door (2) opens automatically the feeding circuit of the tungsten halogen lighting lamps (8) as the door is opened.

8. Oven as claimed in any preceding claim, wherein a knob (13) of a timer fixes the proper cooking time and a knob (14) of a switch/regulator selects the lighting of the tungsten halogen lamps (8) and controls their power.

9. Oven as claimed in any preceding claim, wherein the distnace between the upper couple of reflectors (9) is increased to accomodate antenna and a stiner for the distribution of the energy generated in a magnetron like in a conventional microwave oven, the food being cooked in the oven space cavity (3) by the combination of the microwave and luminous energies.

10. Oven as claimed in any preceding claim, wherein at least one of the reflectors (9) and their lamps (8) are replaced by ultraviolet germicidal lamps, the combined action of heating and germicide rays acting as a sterilizer, a ultraviolet filter being added on the translucent material of the door.

11. Oven according to anyone of claims 8 to 10, wherein said knob (14) chooses also the combination of lamps (8) with ultraviolet germicidal lamps or microwave energy source.

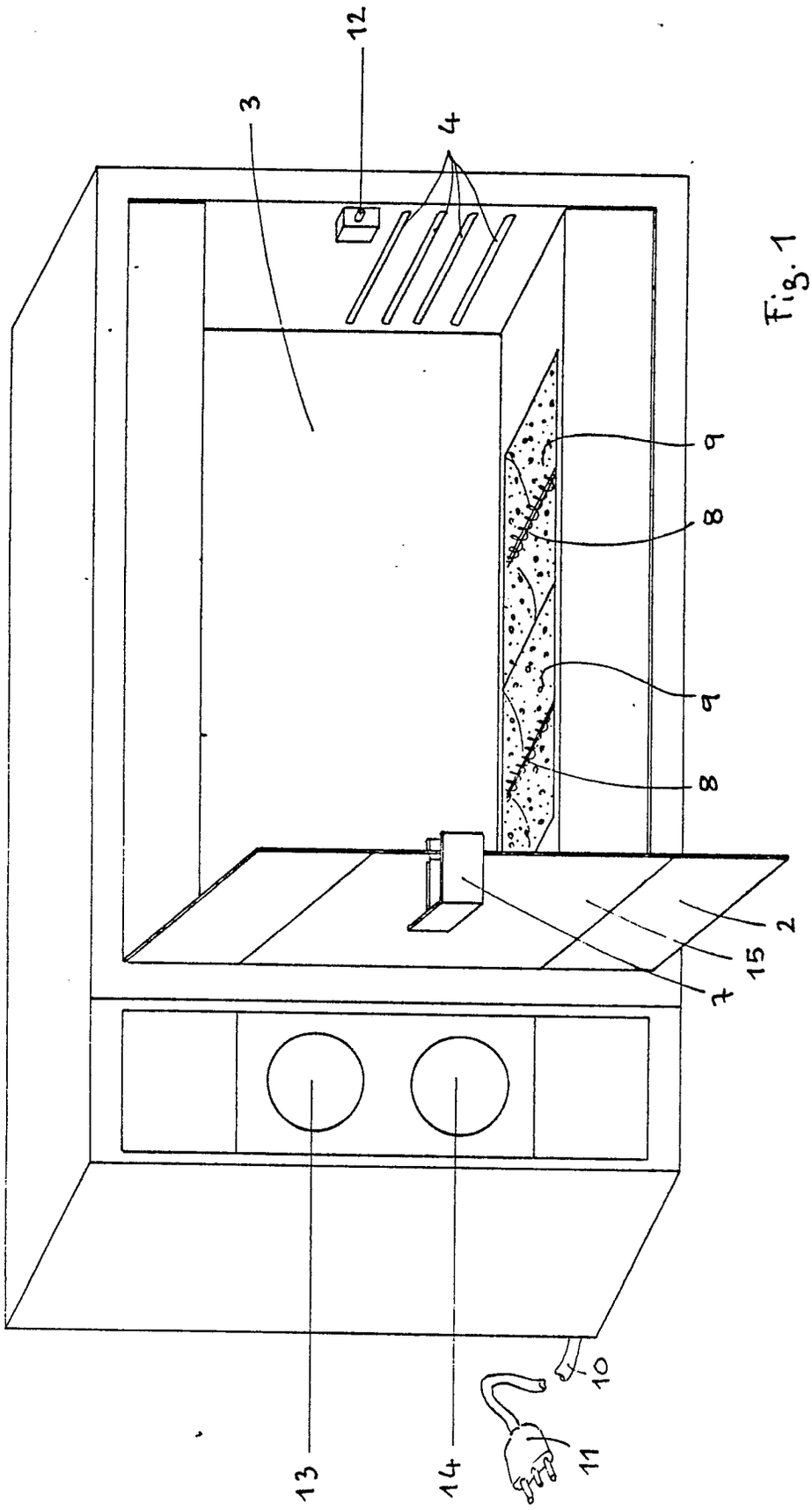

Fig. 1

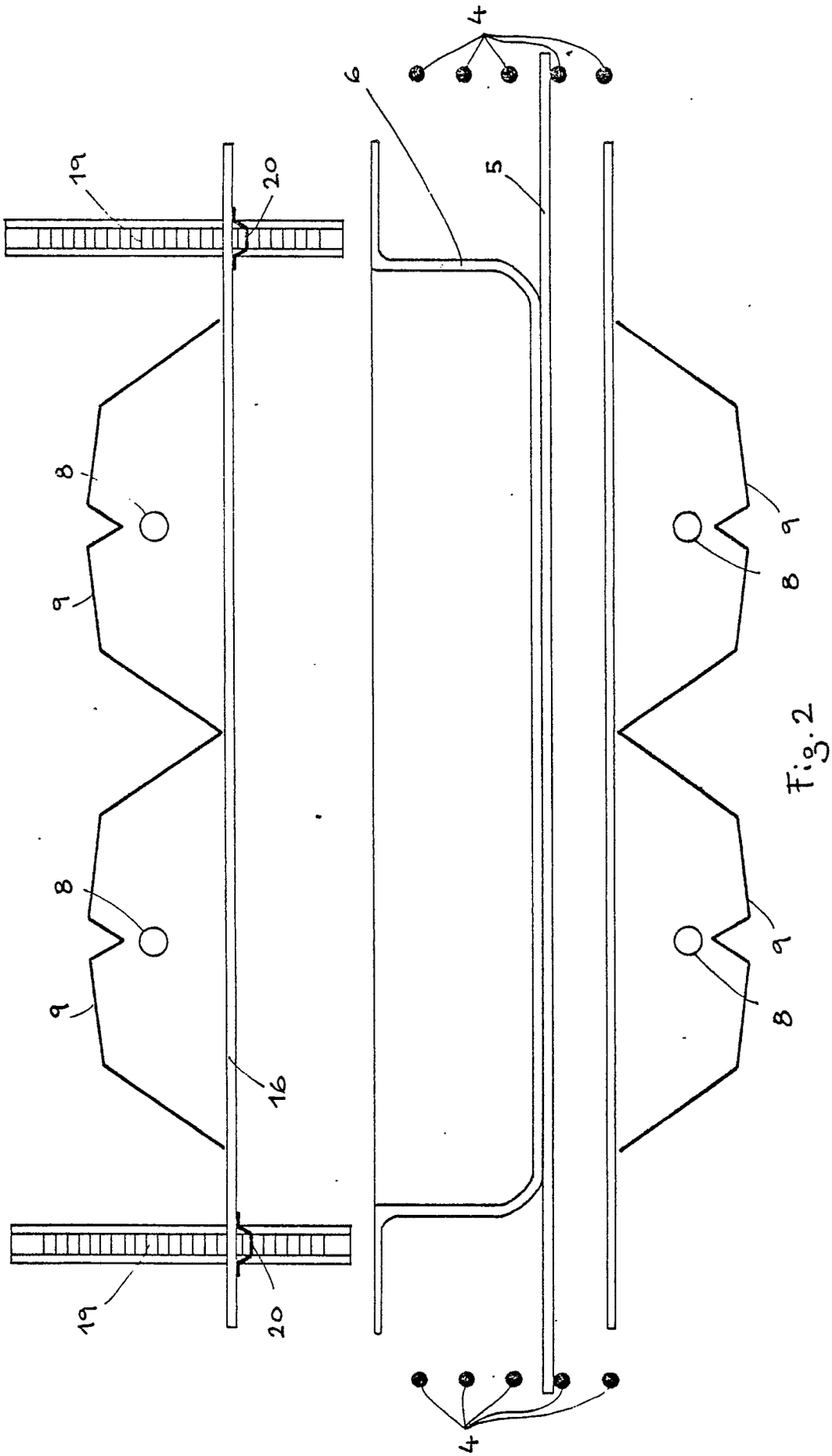

Fig. 2

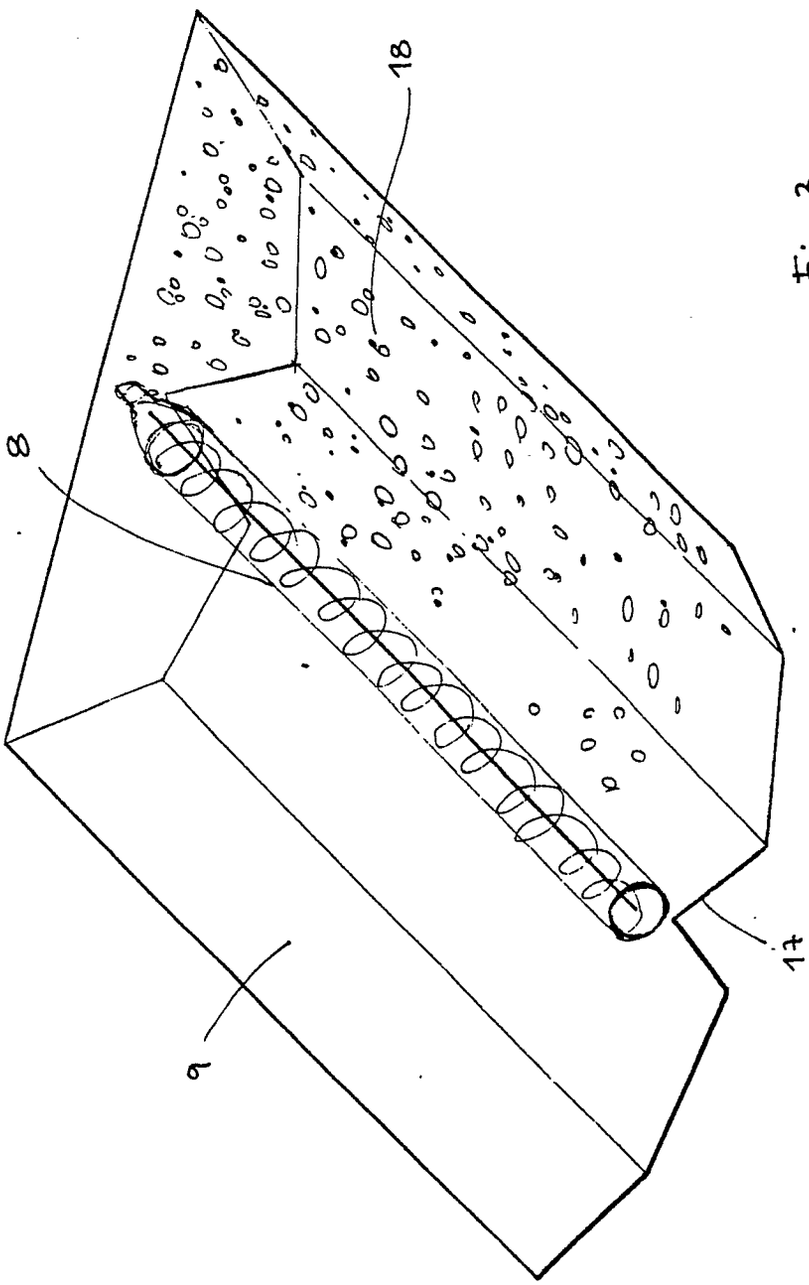

Fig. 3