May 6, 1969 H. A. PÜSCHNER 3,443,050

APPARATUS FOR HEATING NONMETALLIC SUBSTANCE, PARTICULARLY FOODSTUFFS, BY MICROWAVE ENERGY

Filed Feb. 7, 1966

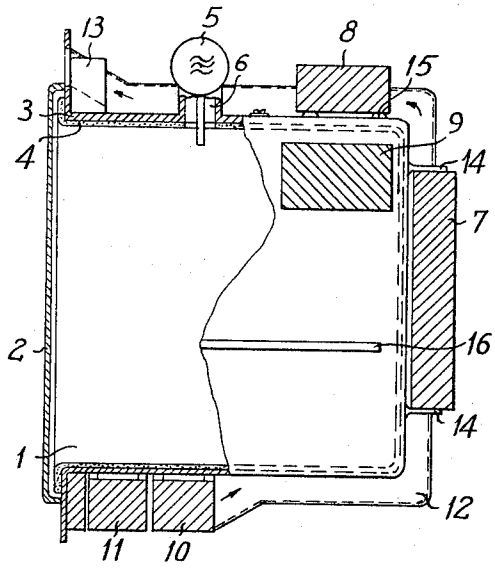


Fig.1

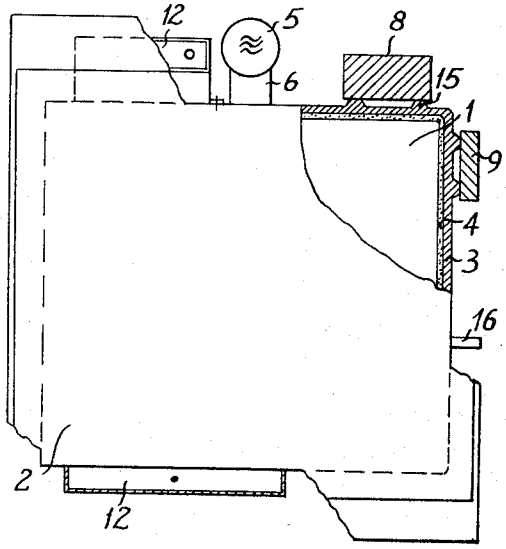


Fig.2

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United States Patent Office

3,443,050

Patented May 6, 1969

3,443,050

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Filed Feb. 7, 1966, Ser. No. 525,482
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 4 Claims

ABSTRACT OF THE DISCLOSURE

A microwave oven is formed of a unitary casting having a conducting surface enclosing all but the front of the heating chamber and formed with a circular conduit in the top wall upon which the microwave generator is seated. An insert of chromium or plastic lines this casting. An inner conductor extends from the microwave generator along the axis of the circular conduit through the top wall of the casting and inserted into the top of the heating chamber. A noncontacting door closes the front of the chamber.

This invention relates to an apparatus for heating nonmetallic substances, particularly foodstuffs, by microwave energy, consisting of a heating chamber, a coupling system, a generator, a current supply, and a cooling system.

In known apparatus of this type the various assemblies are inserted into a common casing as separate units.

The present invention is based on the consideration that the various constructional parts of the apparatus are all more or less intimately associated, both spatially and in respect of effect, with the heating chamber which receives material to be treated. Consequently in the known arrangement there are requirements in respect of the installation of the individual parts and their connection which can be fulfilled both constructionally and mechanically only with relatively high expense.

The underlying aim of the invention is to obtain an arrangement of the constructional parts which is simpler and better suited to conditions. According to the invention this is achieved by constructing the wall of the heating chamber as a carrier for the other assemblies, said wall being provided on its outside with lugs, projections, or similar fastening members for these assemblies. This results in an arrangement of the various constructional parts which is at one and the same time simple, reliable, and accurate without causing difficulties.

The entire apparatus forms a compact unit which is not only suitable for incorporation in a larger assembly but also for construction as an independent apparatus by insertion into a suitable sheet metal casing. Through the ready accessibility of all the constructional parts after the entire constructional unit has been drawn out, assembly and maintenance are considerably improved.

The wall of the heating chamber may be a light metal casting, so that at the same time it forms the boundary of the heating chamber through a jacket which is a good conductor of microwave currents. The wall of the heating chamber may however also be made of a material which is not a conductor of electricity, particularly plastic material, and it can be provided with a coating which is a good conductor of microwave currents. The current

conducting coating is preferably provided on the inside and additionally provided with a covering which is free from corrosion and is physiologically acceptable in respect of foodstuffs, for example chromium or plastic.

A particularly convenient and simple construction is obtained by arranging for the coupling system to form a constructional unit with the wall of the heating chamber by being formed thereon.

The entire constructional unit is advantageously constructed as a slide-in unit, chassis slide rails or other slide carriers being provided on the wall of the heating chamber for sliding after the style of a chassis into a cabinet.

One embodiment of the invention is illustrated as an example in the accompanying drawings, in which:

FIGURE 1 shows in side elevation and partly in section an apparatus for heating foodstuffs by microwave energy, according to the invention, and

FIGURE 2 a front elevation corresponding to FIGURE 1.

The apparatus illustrated consists essentially of a heating chamber **1**, into which the foodstuffs to be heated are introduced. At its front the heating chamber has a contact-free door **2**.

The wall **3** of the heating chamber consists of a light metal casting and is provided with a coating of plastic, which is unobjectionable physiologically in respect of foodstuffs, said coating being in the form of an inserted box **4**.

The wall of the heating chamber serves as carrier for the appertaining constructional assemblies and for this purpose is provided with fastening members.

In addition to the heating chamber, the heating apparatus comprises a microwave generator **5** with coupling **6**, a current supply with a high tension transformer **7** and a heating voltage transformer **8**, a rectifier **9**, a cooling system with heat exchanger **10**, fan **11**, and air duct **12**, as well as a control means **13** with switches and a timer.

The coupling **6** is formed directly on the casting wall **3** and carries the microwave generator **5**. The high tension transformer **7** is mounted on a bracket **14** formed on the wall **3**. The heating voltage transformer **8**, rectifier **9**, heat exchanger **10**, and fan **11** are fastened on projections **15** formed on the wall **3**. The air duct **12** and control means **13** are screwed directly to the wall **3**.

For the purpose of incorporation in the cabinet or the like, slide rails **16** are provided on the side walls.

Within the scope of the invention various modifications are possible; in particular the wall of the heating chamber, if made of nonconducting material may consist of a glass fibre reinforced plastic material.

What I claim is:

1. Microwave foodstuff heating apparatus comprising,

a unitary casting having a conducting surface defining a heating chamber with top, bottom, back and side walls and formed with a circular conduit in said top wall for coupling microwave energy into said heating chamber,

a source of microwave energy seated upon said circular conduit with a depending conductor centered along the axis of said conduit and extending into said heating chamber,

an insert of material that is free from corrosion and physiologically acceptable to foodstuffs completely

lining said walls and formed with an opening through which said depending conductor protrudes,

and a contact-free door covering the front of said heating chamber.

2. Microwave foodstuff heating apparatus in accordance with claim 1 wherein said material is plastic.

3. Microwave heating apparatus in accordance with claim 1 wherein said material is chromium.

4. Microwave foodstuff heating apparatus in accordance with claim 1 wherein said unitary casting is conductively coated plastic.

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