

Reactor for the thermal treatment of solid organic waste and used oils.

To answer unanswered questions.

With reference to the diagram at the end

Reactor for the heat treatment of solid organic waste and used oils consists of a heat treatment chamber (1), with very high efficiency, two concentric cylindrical pipes placed horizontally in special steels resistant to high temperatures, an inner pipe (2) having the role of main focus connected to a burner (3) with flame and adjustable power according to the needs and an external duct (4), to several functions, mainly with the role of external closure of the heat treatment compartment (1).

On the other hand, as a wall absorbing the temperature by its lower zone with a cylindrical sector (5) covers the entire length of the heat treatment compartment (1) by being welded to it, and forming a combustion chamber with two (6) burners (equipped with an additional burner (7) for the correction of the temperature of the fumes from the first fireplace (2), gases which are discharged and forced into the second combustion furnace (6) via a sealed duct (8) located on the opposite side of the first burner (3). Thirdly, the rest of the surface of the external duct (4) has a role in absorbing the fumes by the wall of the first burner (3), but also of the second burner (7), which are evacuated by the opposite end of the second burner (7), so as to transfer a good part of the thermal energy to the heat treatment compartment (1).

On the lateral and upper areas, using a reflective and airtight outer protective casing (9) and a drywall system (32), we create turbulence and increase the path of flue gases to the thermal energy recuperates from the exhaust and heat treatment (1) connected to a multifunctional assembly (10) called helical spiral conveyor belt with double gears at the ends (11), having the role of horizontal conveyor, stirring, homogenization, dislocation, circular transport and scraper of the supposedly pyrolyzed waste.

In addition, for the continuous cleaning of the two inner (2) and outer (4) pipes of the treatment chamber (1), consisting longitudinally of several long metal pipes (12), of a length greater than that of the heat treatment chamber (1) with the axes on the generators of a cylindrical surface inscribed in the center in the median cylindrical surface of the treatment chamber (1) positioned at equal distance from each other at modular distances so that a module represents a circle sector of the base circle the cylindrical median surface as a multiple of the diameter of the metal tube (12) stiffened in a cylindrical assembly, at both ends, by means of two paired flanges (13), between the flanges being fixed in addition, at both ends of the tube joints (14) so as to form with the ends of the longitudinal tubes (12) a toothed crown (12,14) necessary for the mechanical rotation of the whole of the multifunctional assembly (10) by means of the sprockets (11), being stiffened for a long time.

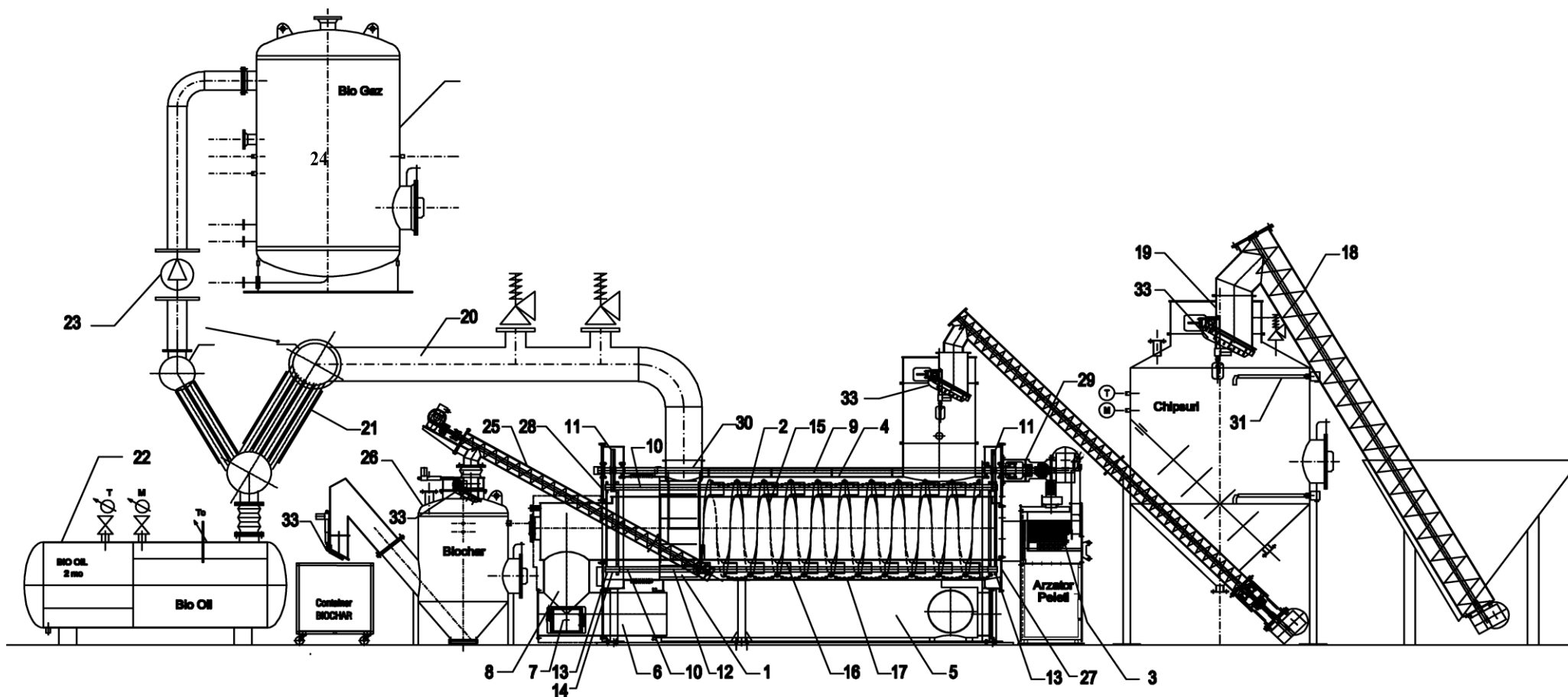
Generally by spiral diaphragms (15), in high temperature sheet metal, in the form of an auger,

the multifunctional assembly (10) being equipped in the steps between the spiral diaphragms (15) with a circular transport system and scrapers (16) and stirring, homogenization and dislocation (17), the main production circuit being provided with a feeder (18) with secure access mouthpiece (19), equipped with a unidirectional damper (33), waterproof, at the upper end of the outer pipe (4), to the burner from the main combustion chamber (2), at the opposite end of the main burner (3), also above is mounted a pyrolysis gas collection device (20), fraction that passes over the flow, to a condensing installation of the liquid fraction of pyrolysis oil (21), which is stored in a temporary storage tank (22) and the rest of the uncondensed gas called pyrolysis gas is stored by compression using the pump (23) in special gas tanks (24), for utilities.

At the end of the same external pipe (4) of the heat treatment chamber (1), laterally, a solid-material screw conveyor of a biochar nature (25) is mounted and is in the form of a solid fraction escaped to a temporary storage tank (26) being made by means of a unidirectional damper (33) and at the end of the heat treatment chamber (1) are mounted and sealing flanges (27,28), designed in such a way that the two main circuits, that of fumes for heat treatment, with the resulting waste circuit and products not to be physically intertwined except by heat transfer through the watertight walls mentioned.

For the supply, it is provided a secure access mouth (19), up to a level fixed by a capacitive sensor (31) and for the introduction of the fuel is programmed the production process, the starting temperature, the treatment, the initial supply quantity, the exposure times, through the analyses of the chemical composition of the waste received to be treated thermally, the main burner (3) starts a multifunctional assembly (10) controlled in speed, by means of an electric motor (29), which by means of a longitudinal motor shaft (30) on which are mounted two sprockets (11) corresponding to the toothed crowns formed by the two types of pipes (12, 14) clamped between the end flanges (13), of the multifunctional assembly (10), so that the substance subjected to pyrolysis is permanently and uniformly distributed over the surface of the pipes (2).

The introduction into work of the second burner, secondary, of the second combustion chamber (6), is done as the raw material is transformed into gas and biochar are added at an automatic rate controlled by the level sensor (31) of new quantities of waste, without supply of fresh air by the locking effect obtained by the non-return valves (33) and for the evacuation of the three useful components of the products resulting from the pyrolysis of waste, in different quantitative percentages, specific to the quality of the waste, pyrolysis gas, pyrolysis oil, biochar, etc., temporary storage tanks are provided (22, 24 and 26).



Vue arrière

