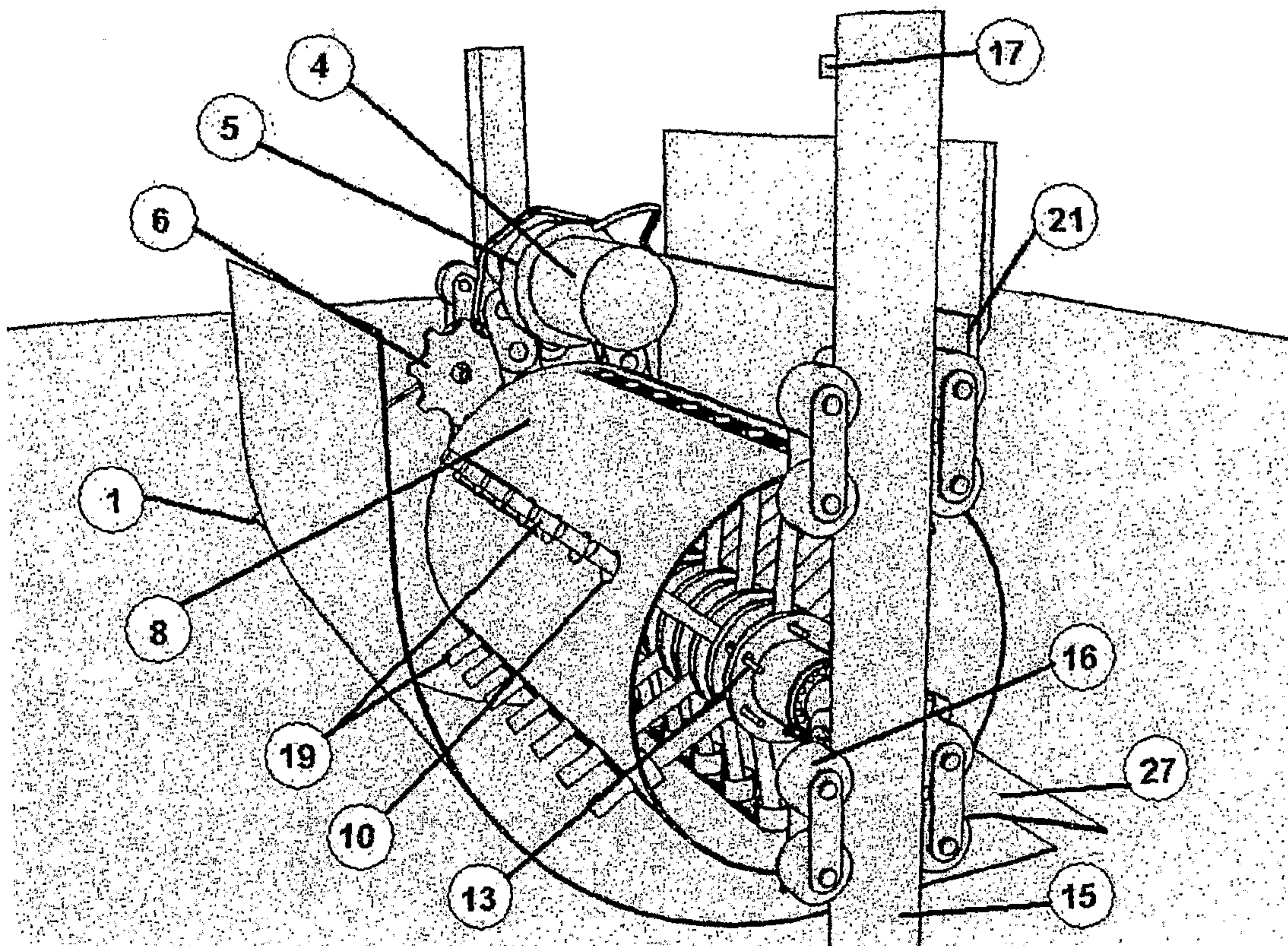




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(54) Titre : DISPOSITIF DE PRESSE DE DECHETS
(54) Title: WASTE PRESS DEVICE



(57) Abrégé/Abstract:

The invention relates to a waste press device consisting of a rotating drum (8). The drum (8) contains an eccentric internal shaft (9), from which striking rods (12) pass through a inlet hole (10) and through the drum, with the drum end reciprocating axially during one revolution.



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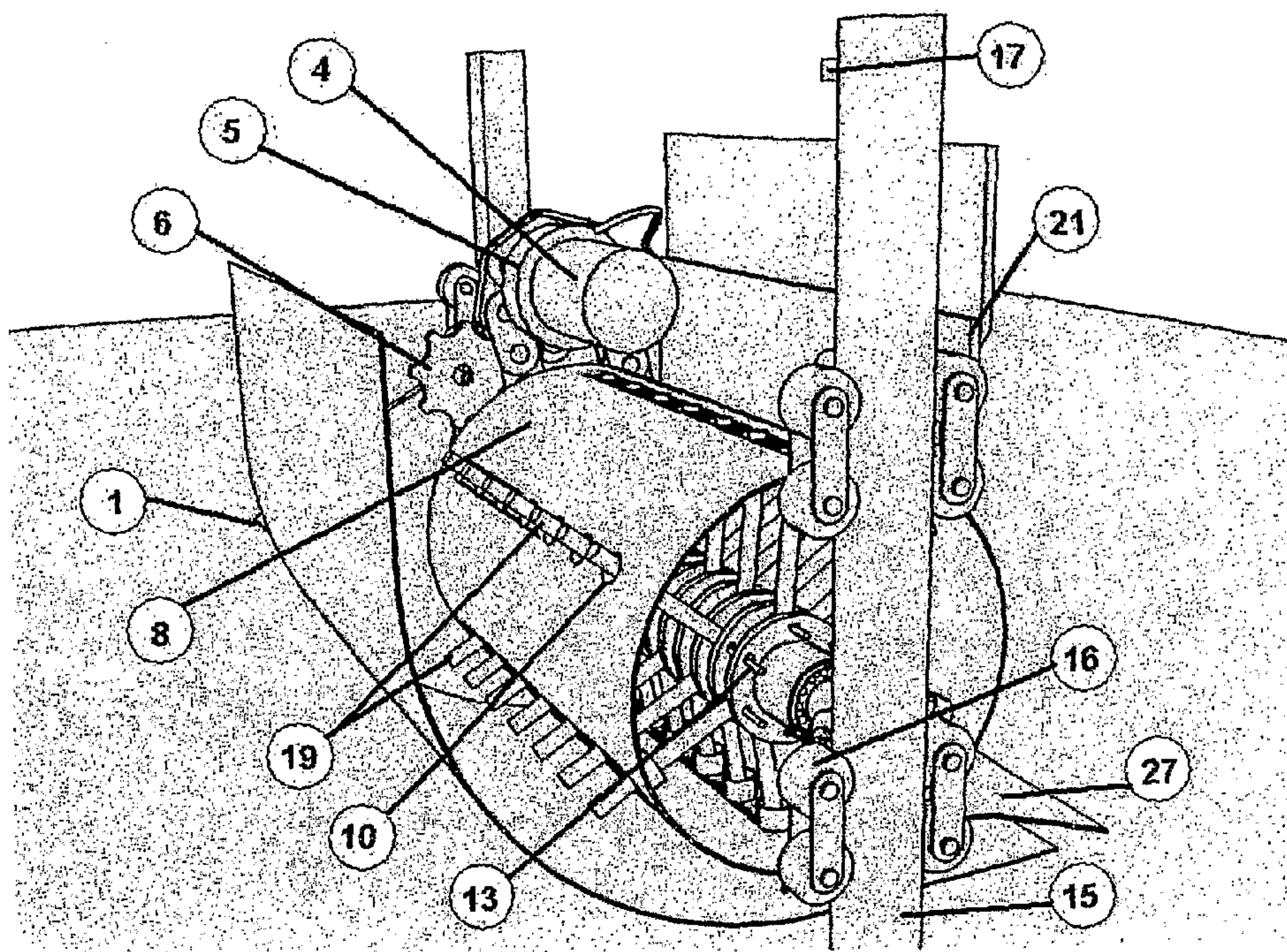
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(54) Title: WASTE PRESS DEVICE



(57) Abstract: The invention relates to a waste press device consisting of a rotating drum (8). The drum (8) contains an eccentric internal shaft (9), from which striking rods (12) pass through an inlet hole (10) and through the drum, with the drum end reciprocating axially during one revolution.

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Waste press device

5 This invention relates to a waste press device comprising a rotating drum having an internal eccentric inner shaft, from which transfer rods pass through an inlet hole through the drum so that an end of the rod reciprocates axially during one revolution.

10 Waste presses known *per se* comprise pendulum piston presses, screw presses, axial-piston presses, baling presses, crushers, roller crushers and hook shredders, FI 41935, US 3 279 357 and GB 1 024 726, for instance, disclose waste press devices known *per se*. These waste presses known *per se* have the following shortcomings:

15 Pendulum piston press: a small-sized hopper opening, hydraulics; screw press: slow because simultaneous crushing and pressing (inadequate force for both operations); axial-piston press: an intermediate lid with low fault tolerance (detachment under wear), discontinuous feed, hydraulics; bale press; intended for small batches at one time, hydraulics, (relatively) high cost; crushers: only crushing, no pressing, materials required to be transferred to a separate press;
20 roll crushers: only reduction of treated material particle size, treated materials stick to crusher teeth and return for other treatment cycles; so called hook shredders: only shredding and crushing, materials required to be transferred to a separate press.

25 This invention has the purpose of overcoming the drawbacks mentioned above. The waste press device of the invention is characterized by the rack of the device is arranged to move on vertical rails.

30 The waste press device of the invention has the following advantages:

Low power consumption < 15kW per device: low operating costs. High material handling capacity: time saving. Easy maintenance: no long delays for the customer in case of malfunction. Straightforward mechanism: reliability.

35 Versatility: available in any size, with any width and height.

Low operating costs compared to hydraulic presses.

Higher continuous feed speed: can handle larger amounts of materials in a shorter amount of time compared to other presses.

- 5 No hydraulics: more environment-friendly and easier maintenance (also in the winter).

10 It is able to reduce treated material to smaller particle size (e.g. cardboard and wood) if desired because of separate shredding rolls, in order to fit more material better into containers, which means less frequent emptying of containers. Slowly rotating mechanism: low operating costs and higher reliability. The device rises over objects or materials that are too big: higher fault tolerance. Controlled by PLC logic: no need for physical monitoring of the device.

15

The invention is explained below by means of an example and with reference to the accompanying drawings, in which

20 Figures 1-3 are axonometric views of the waste press from three different directions.

The power supply is 400V/50Hz, fuse requirement: slow 32A. (1) over a current wire cable to the device, from the plug contact to the electric cable (3), from there to the electric motor (4) having a power in the range 40W-40kW.

25

The electric motor is connected to a reduction gear (5) having an approximate ratio of 1:7. On the reduction gear a sprocket wheel (6) and the power transmission by means of a chain (7).

30 Chains drive two parts: the outer drum (8) and the inner shaft (9). The outer drum has a number (n) of openings in rows (10) and the inner shaft comprises transfer-rods (12) between flanges (11), the transfer-rods being "locked" by locking shafts (13).

35 All the parts 4-13, 17,22 mentioned above are fixed to the same "rack", which has vertical degree of freedom in the vector Z. Movement in the direction of planes X and Y is limited by rails (15).

As the rack rises on the rails (15) along the rolls (i.e. controlled by rolls (16)) up to the set (e.g. limited) height, a limit-switch (17) short-circuits and operation/drive is interrupted. The fed material can be directly reduced by means of "shredders" (18) placed between the paths of the transfer-rods (the shredders are e.g. rolls or disks).

The transfer-rods pass radially through the rod openings on the drum outwards on the input-side (19) and inwards on the container (20) side. When the transfer-rods have been completely retracted, the drum-wedge (21) (part of the rack) mechanically removes all the small residues from the drum surface. During the drive-cycle, the drum and inner shaft rotate at the same speed of rotation. The device can be controlled via PLC logic (25). The materials are fed through a feeding opening arrive via the hopper ramp (26). A ramp (27) can be placed to direct material upwards into the container.

The machine can be manufactured in a variety of sizes, for various purposes of use by utilizing variations of the machine: municipal household waste compactor, cardboard and paper compactor, wood or timber compactor, expanded polystyrene and other packaging materials compactor, a small household compactor, waste collection vehicle compactor, waste-bin pre-compaction unit, restaurant food-waste bin compactor.

Examples of shredders: rollers, toothed shredders, fixed or stationary shredders, axe-head blade shredders.

The entire rack can be shock absorbed by means of springs and shock absorbers.

The shock absorption and springs can be adjustable.

The drum may be height-adjustable relative to the hopper ramp.

The feeding entrance to hopper ramp may be dispensed from the side or from the top.

The hopper ramp may be straight, oblique, inclined, convex, concave or mobile.

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A compression-ramp directly after the drum, may be straight, oblique, inclined, convex, concave or mobile.

- 5 The power transmission may consist of a chain, rope, pinion gear, worm gear or any other drive member or mechanism. Power transmission may also be implemented by hydraulic means. The power transmission may also be manual.

- 10 The shape of the transfer-rods may be: sharp, pointed, blunt, conical, chisel-point, crosshead, toroidal head and may even have a moving member or a mechanism at the end of the rod.

The compactor may comprise of n. amount of rods in n. amount of rows.

- 15 The same machine may comprise of two or more drums with their respective transfer-rods.

The transfer-rods may be protected inside the drum with an elastic material.

- 20 The inner shaft can be protected e.g. by encapsulation or rubber mass lining.

All the parts and components can be coated e.g. with a suitable protective resin.

The outer drum in itself may be flexible and radially adjustable.

25

The drum (8) does not necessarily move vertically on the rails (15), but equally may move horizontally: for instance, in a low space, the entire waste compactor may be turned upside down or 90 degrees on principle. The machine may also operate with the drum (8) in stationary position and the side of the machine separates from the drum if material gets between them and is pressed through.

30

The transfer-rods (12) in the drum (8), which form an elongated comb, may also be replaced with a plate-like or slab-like element, which conveys or transfers liquid or similar substances through the waste compactor better than transfer-rods.

35

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Since the rack consists of the drum (8) with a mobile unit and its components, it can be easily lifted upwards on the rails (15) and removed for service or repair.

Claims

1. A waste press device comprising a rotating drum (8) having an internal eccentric inner shaft (9), from which transfer rods (12) pass through a inlet hole
5 (10) through the drum so that an end of the rod reciprocates axially during one revolution, **characterised** in that a rack of the device is arranged to move on vertical rails (15).
2. A waste press device according to claim 1, **characterised** in that a power
10 source of the device is an electric motor (4) rotating both the drum (8) and the inner shaft (9) via a transmission.
3. A waste press device according to claim 1 or 2, **characterised** in that
15 shredders (18) are fixed to the device rack between the drum (8) and the transfer rods (12).
4. A waste press device according to any of the preceding claims,
characterised in that a ramp (27) is provided in an extension of a feed ramp
20 (26) of the device for directing the goods through the waste press device upwardly and further into a container.
5. A waste press device according to any of the preceding claims,
characterised in that said rack of the device is fixed to rolls (16) moving on
25 vertical rails.
6. A waste press device according to any of the preceding claims,
characterised in that transfer rods (12) comprises a moving member at the end
of each rod.

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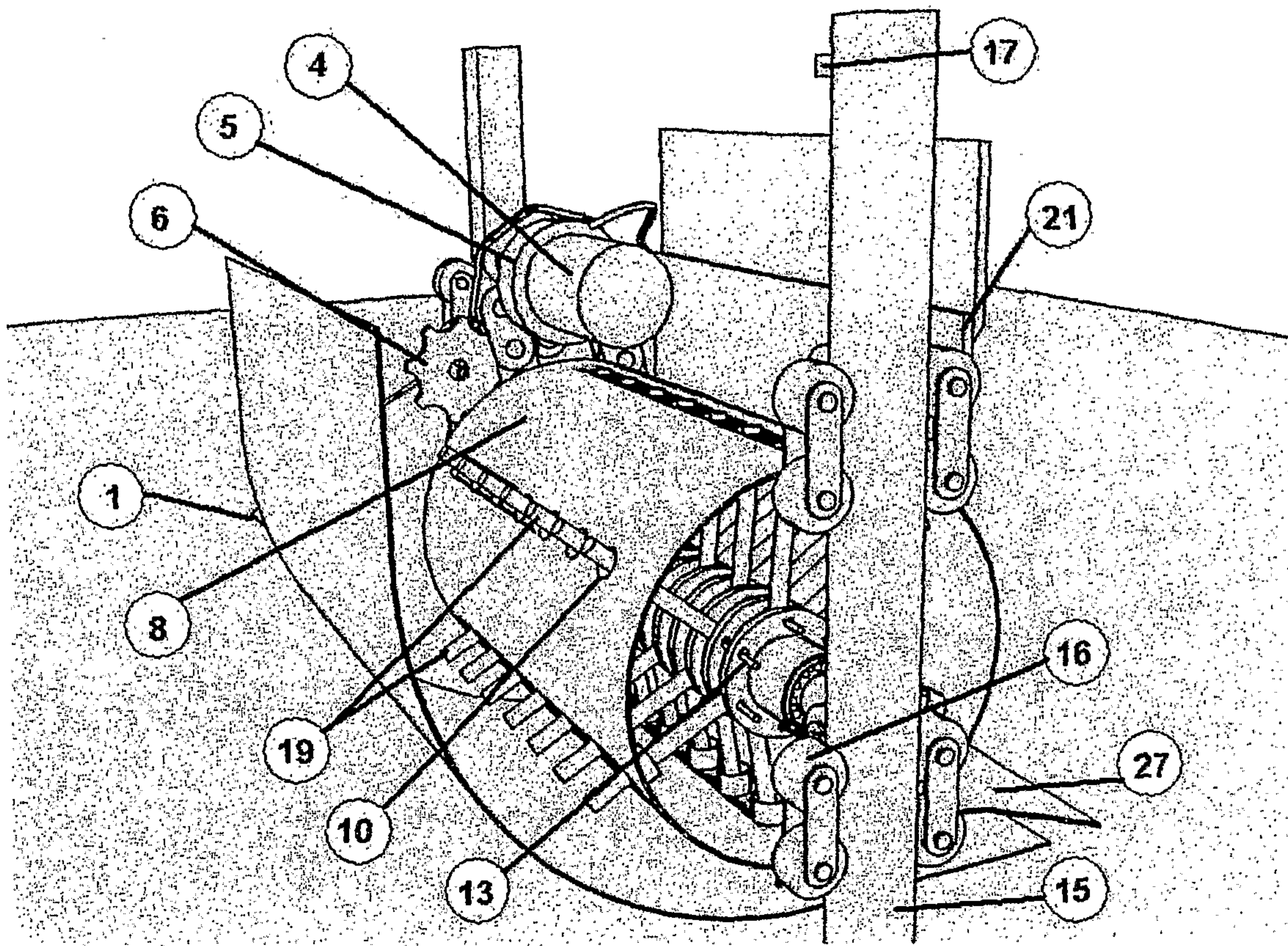


Fig. 1

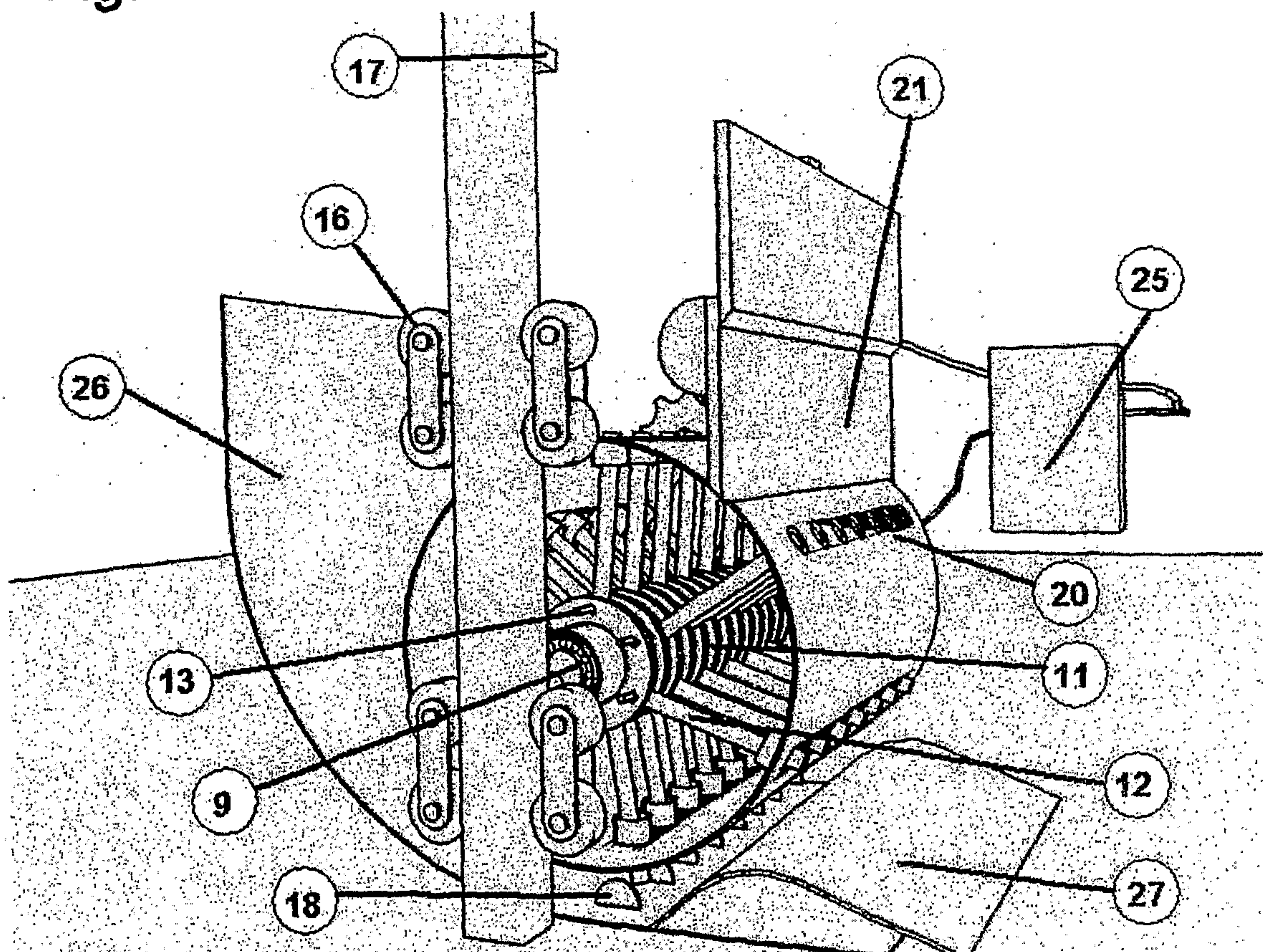


Fig. 2

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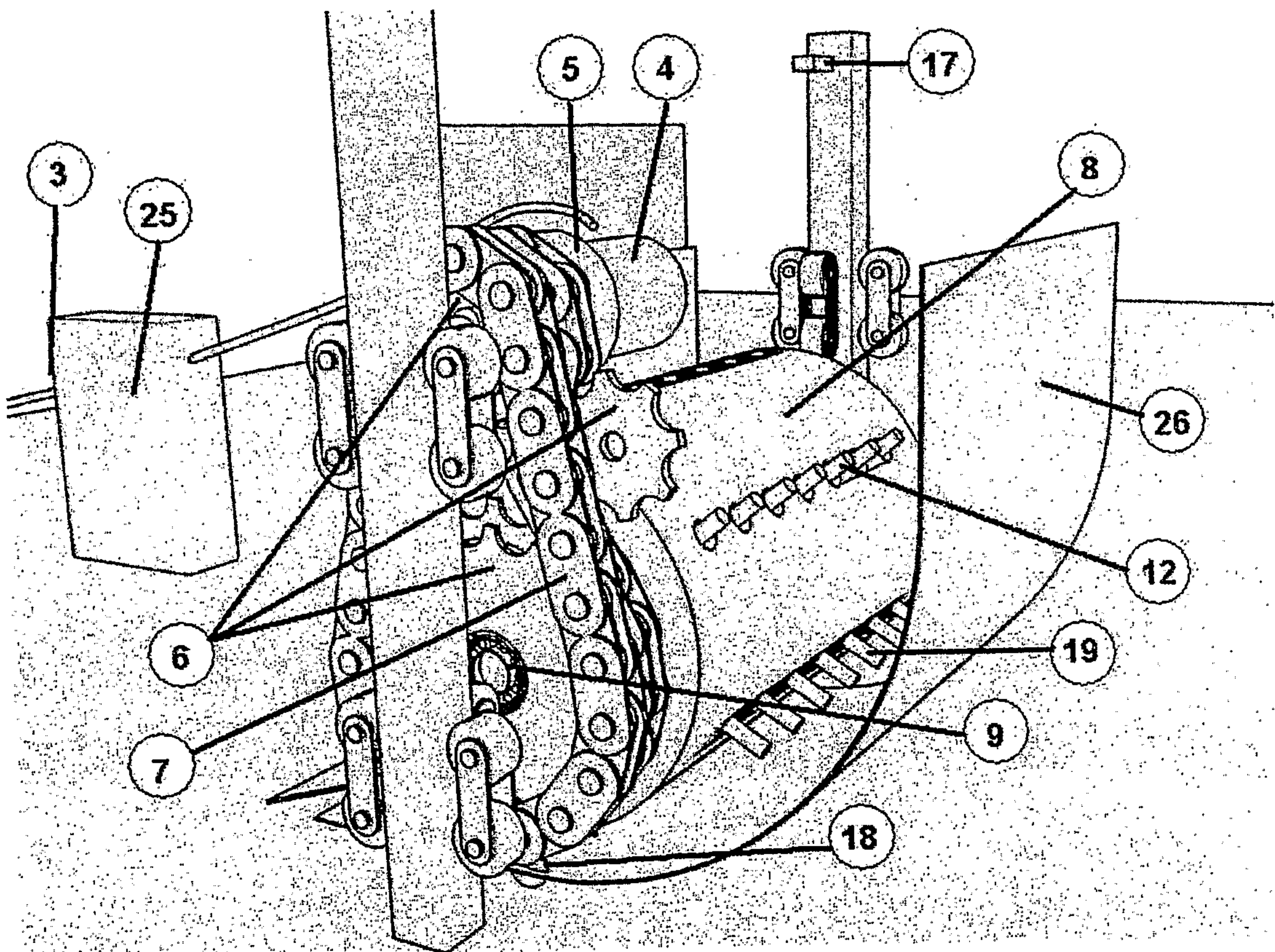


Fig. 3

