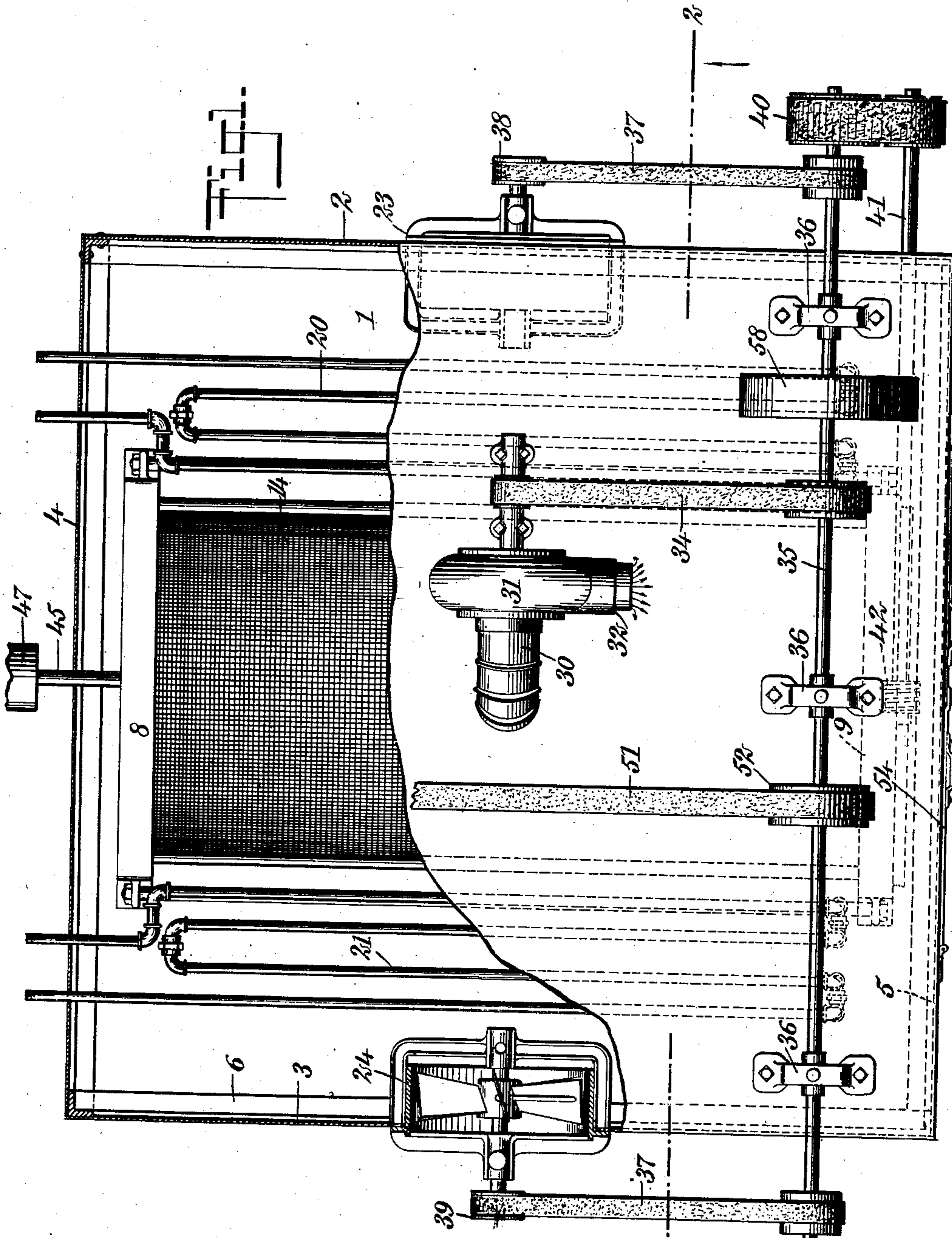


E. R. ZEHNER.
BRISTLE DRYING MACHINE.
APPLICATION FILED JAN. 2, 1909.

938,542.

Patented Nov. 2, 1909.
3 SHEETS—SHEET 1.



WITNESSES

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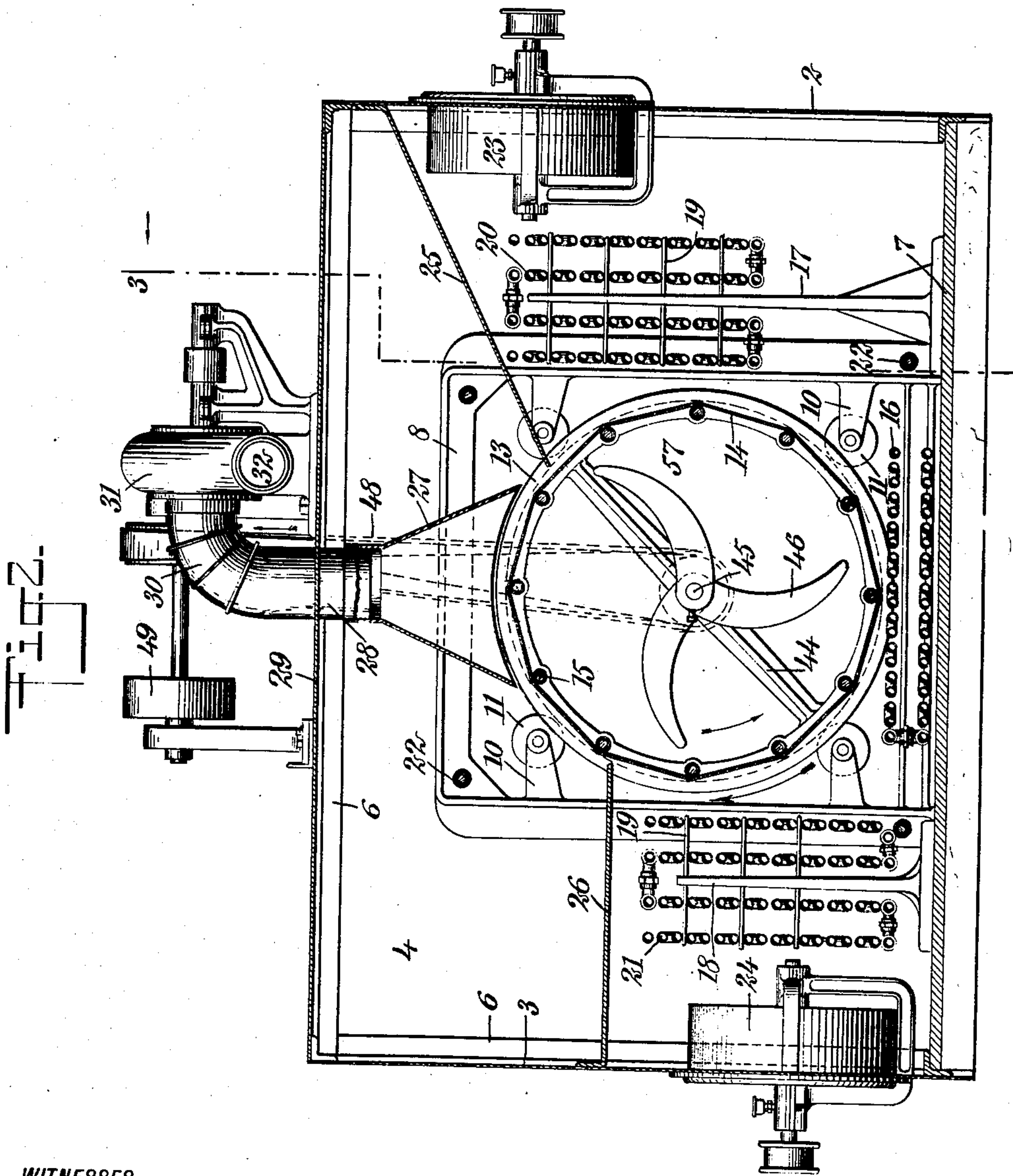
ATTORNEYS

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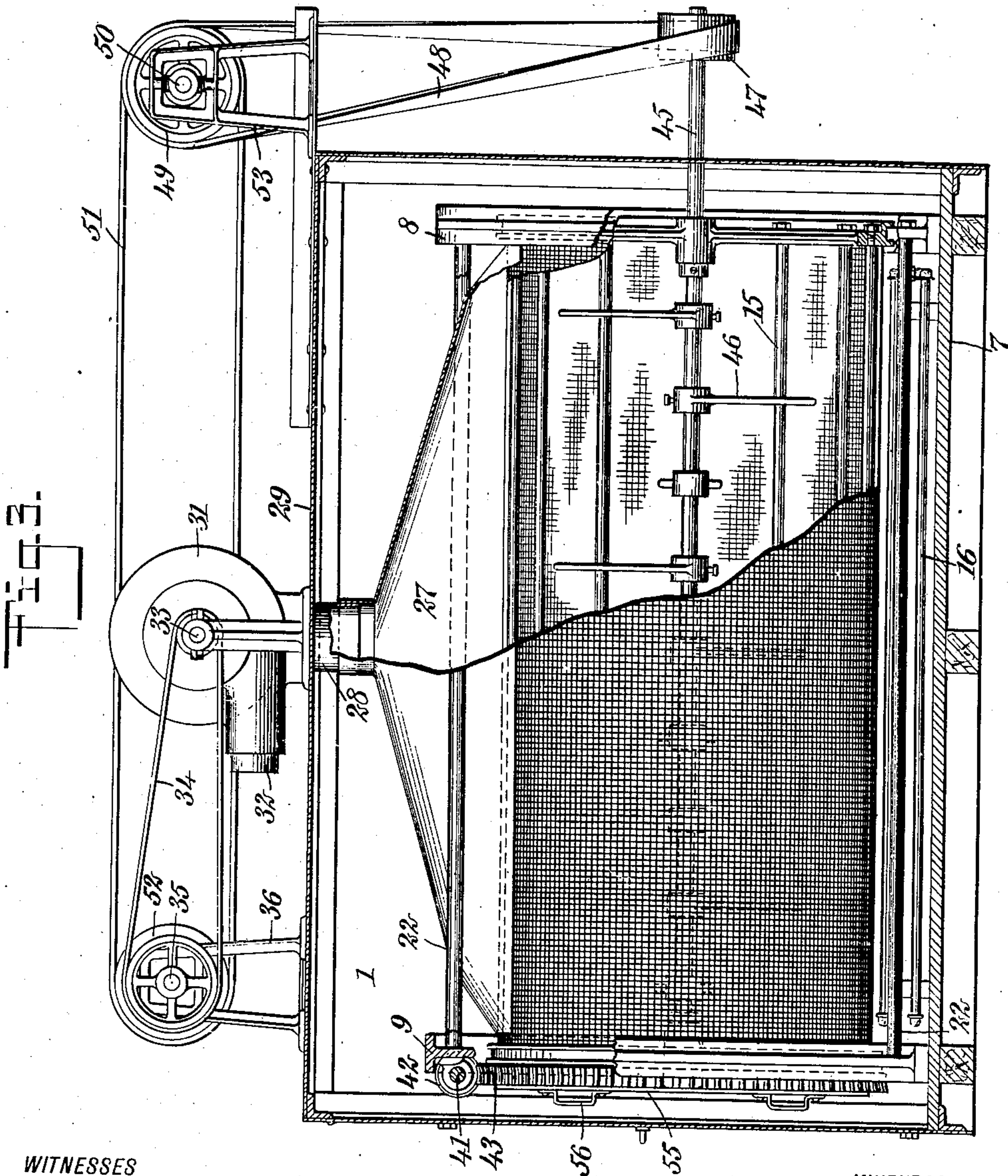


FIG. 3.

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UNITED STATES PATENT OFFICE.

ERNEST R. ZEHNER, OF TOLEDO, OHIO.

BRISTLE-DRYING MACHINE.

938,542.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed January 2, 1909. Serial No. 470,363.

To all whom it may concern:

Be it known that I, ERNEST R. ZEHNER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a new and Improved Bristle-Drying Machine, of which the following is a full, clear, and exact description.

This invention relates to drying machines, and more particularly to a drying machine the purpose of which is to dry bristles.

The object of the invention is to produce a machine for this purpose which can treat a large quantity of bristles, and which operates in connection with a drying current of hot air. The bristles are treated in such a way that they are turned over and over so that they become uniformly exposed to the heat during the drying process.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan of a drying machine constructed according to my invention, a portion of the same being broken away so as to expose the interior arrangement; Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1; and Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2, certain parts being shown in elevation.

Referring more particularly to the parts, 1 represents the case of the machine which is of box form, consisting of vertical side plates 2, 3, a rear wall 4, and a forward wall 5. These walls are all secured on angle iron frames 6, and the casing is provided with a suitable bottom or floor 7, as shown in Fig. 3. Near the ends of the case, substantially rectangular frames 8 and 9 are mounted. As indicated in Fig. 2, these frames 8 and 9 are provided with inwardly projecting brackets 10 having rollers 11, and these rollers afford supports and operate as guides for annular heads 13 of a tumbling barrel or cylinder 14. The body of this cylinder is formed of wire gauze of suitable mesh, constituting a pervious wall, and the cylinder is polygonal in cross section, as shown in Fig. 2. This polygonal form arises from the fact that the wire gauze of the cylinder 14 is attached to longitudinally disposed ribs or

rods 15. These ribs 15 are disposed an equal distance apart and are arranged near the inner edges of the rings so as to form a skeleton or framework for the cylinder or barrel, as will be readily understood.

Under the cylinder 14, I provide a steam coil 16, and at each side of the cylinder I provide racks 17 and 18, which racks are provided with cross arms 19. These cross arms support the steam coils 20 and 21, as shown. In order to give the frames 8 and 9 rigidity, they are connected by horizontal stay rods 22. In the side wall 2, a fan 23 is provided, and a similar fan 24 is provided at an opening in the opposite wall. The fan 23 is in an elevated position, and adjacent to it there is provided a guide plate or apron 25 which directs the air downwardly from the fan through the steam coils 20 and through the gauze wall of the cylinder. As indicated the lower edge of the apron 25 is located quite near to the wall of the cylinder. The fan 24 is arranged so as to blow air through the steam coil 21 and this fan is disposed near the floor, as shown. Over the steam coils 21, a horizontal guide plate or apron 26 is provided which directs the air from this fan into the left side of the cylinder, as shown.

Over the cylinder and extending longitudinally thereof, there is provided an elongated hood 27. The walls of this hood converge upwardly and the hood is connected with a tubular neck 28 which leads up through the cover 29 of the case and connects with an elbow 30 which operates as an intake for the exhaust fan 31, which fan has a delivery outlet 32. This fan has a horizontal shaft 33 which is adapted to be driven continuously by a belt 34. This belt runs over from a countershaft 35 which is mounted upon suitable brackets 36 on the cover of the case. From this shaft 35 belts 37 extend downwardly and pass around pulleys 38 and 39 which drive the fans 23 and 24, respectively. The shaft 35 is provided with a belt 40 which drives a worm shaft 41. This worm shaft extends horizontally through the case, as shown in Fig. 1, and near its middle point it is provided with a worm 42. This worm meshes with a worm wheel 43 which is formed on one of the ring heads 13. From this arrangement it should be understood that when the worm shaft is rotated the tumbling barrel or cylinder will be rotated at a slow speed.

The annular heads or rings 13 are provided with cross arms 44, and in these cross arms, a picker shaft 45 is rotatably mounted. This picker shaft extends longitudinally throughout the entire length of the cylinder and is provided at intervals along its length with rigidly attached picker arms 46. These arms 46 are curved, as shown, and are slightly pointed at their outer ends. They project forwardly with respect to the direction of the rotation of the shaft, and the outer ends of these pickers lie near the wall of the cylinder. This shaft 45 extends through the wall 4, and on the exterior of the case is provided with a belt pulley 47 which is driven continuously by a twisted belt 48 running over a pulley 49 on the countershaft 50, said countershaft being driven continuously by a belt 51 running over from a pulley 52 on the countershaft 35. The shaft 50 is mounted on suitable shaft brackets 53 which are similar to the brackets 36. The driving mechanism for the picker shaft 45 is arranged so as to drive this shaft in a direction opposite to that in which the tumbling barrel rotates.

The front wall of the case is provided with a pair of swinging doors 54, and the forward end of the barrel or cylinder is provided with a removable head 55 having suitable handles 56 which facilitate its removal. The opposite end, that is, the rear end of the barrel, is provided with a permanently attached plate or head 57 which closes that end of the cylinder.

In the operation of the machine, the cylinder or barrel is charged with the wet bristles and the steam is turned on in the steam coils. The shaft 35 is then driven through the medium of a pulley 58 which drives the blowing fans or blowers 23 and 24 and at the same time rotates the barrel and the pickers 46. The exhaust fan 31 is operated at the same time so as to withdraw the moist air from the upper wall of the barrel and discharge this moist air into the atmosphere. The arrows in Fig. 2 indicate the direction of rotation of the barrel and the pickers. It will be evident that during the rotation of the barrel the pickers are constantly stirring the bristles so as to overcome any tendency to form lumps, and in this way the bristles are kept agitated, while the warm air from the pipe coils is driven through the cylinder wall. At the same time hot air is constantly rising from the steam coil and passing up through the barrel. The rollers 11 operate to support the cylinder and materially reduce the energy required to rotate it.

Having thus described my invention, I claim as new and desire to secure by Letters Patent,—

1. In a drying machine, in combination,

a case, a tumbling barrel rotatably mounted therein and having a pervious wall, heaters disposed on opposite sides of said barrel, blowers driving air currents through said heaters and through the wall of said barrel, a hood mounted within said case disposed adjacent said barrel having its edge adjacent to the wall of said barrel, and means for exhausting air through said hood.

2. In a drying machine, in combination, a case, a barrel rotatably mounted therein and having a pervious wall, a heating coil disposed under said barrel, a hood disposed over said barrel and having its edge disposed adjacent to the wall of said barrel, and means for exhausting air through said hood.

3. In a drying machine, in combination, a case, a barrel rotatably mounted therein and having a pervious wall, a heating coil disposed under said barrel, a hood disposed over said barrel adapted to draw air directly through the wall of said barrel, means for exhausting air through said hood, and means for blowing air through said barrel.

4. In a drying machine, in combination, a case, a barrel rotatably mounted therein and having a pervious wall, a picker shaft extending through said barrel, pickers carried by said shaft projecting oppositely from said shaft, means for rotating said barrel, means for rotating said picker shaft, means for driving an air current through the wall of said barrel, and means for exhausting the air from said barrel.

5. In a drying machine, in combination, a case, a tumbling barrel rotatably mounted therein, heating coils mounted at opposite sides of said barrel, blowers for forcing air currents across said coils and through the wall of said barrel, aprons adjacent to said coils and directing air toward said barrel, a heating coil under said barrel, a hood disposed over said barrel, and means for exhausting the air through said hood.

6. In a drying machine, in combination, a case, a tumbling barrel rotatably mounted therein, heating coils mounted at opposite sides of said barrel, blowers for forcing air currents across said coils and through the wall of said barrel, aprons adjacent to said coils and directing air toward said barrel, a heating coil under said barrel, a hood disposed over said barrel, a picker shaft extending through said barrel and carrying pickers, means for rotating said barrel, and means for rotating said picker shaft.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNEST R. ZEHNER.

Witnesses:

E. T. COLLINS,
CURTIS S. WISE.