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PRESSURE FLUID ACTUATED SPINNING MOTOR

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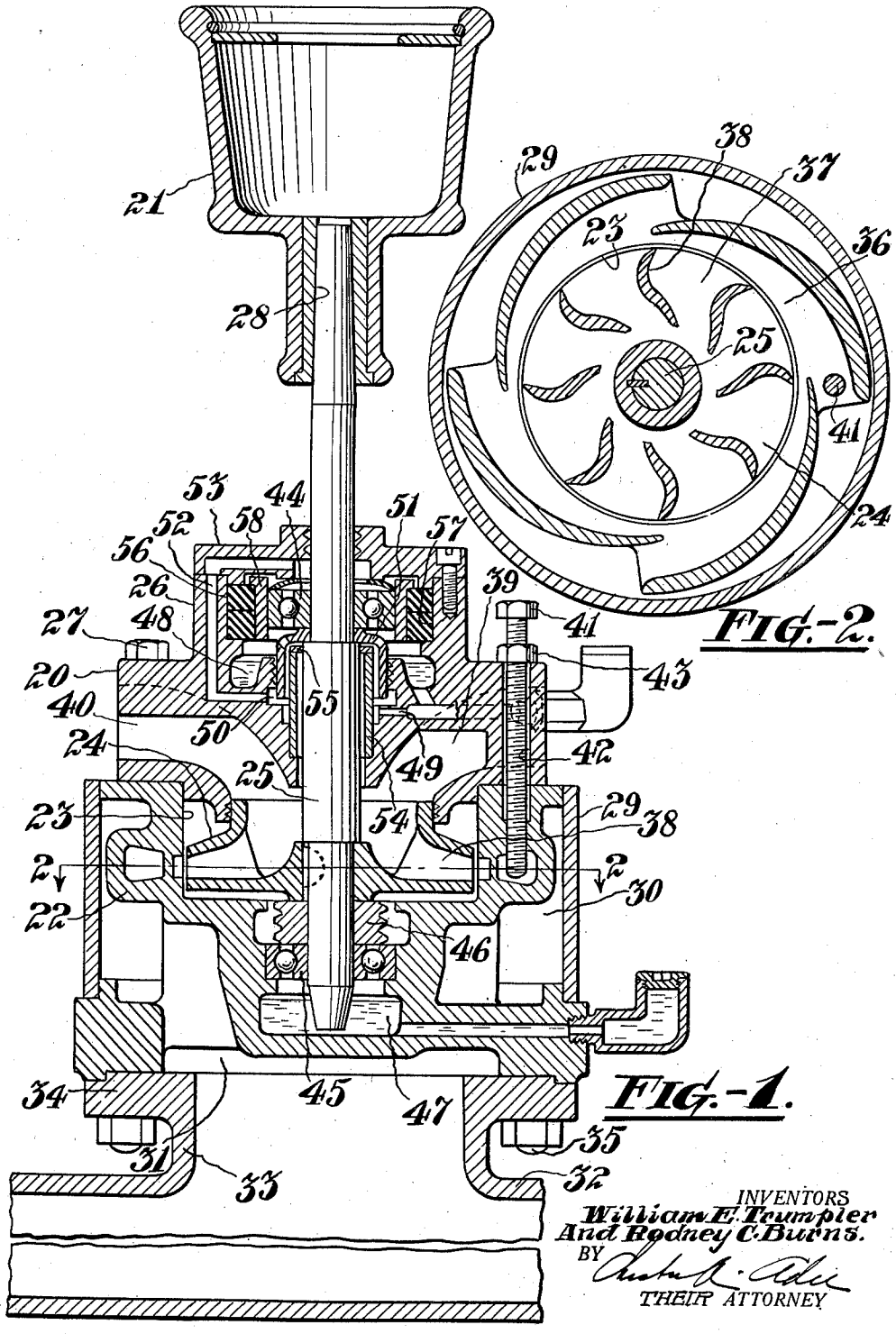

FIG.-2.

FIG.-1.

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PRESSURE FLUID ACTUATED SPINNING MOTOR

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2 Claims. (Cl. 253—55)

This invention relates to motors, and more particularly to a pressure fluid actuated motor.

More specifically, the motor to which the present invention pertains is of the type employed for spinning threads, for example artificial silk, into skeins by centrifugal force, and which threads are formed by suitable extruding mechanism. The threads, upon issuing from the extruding device are guided into a spinning basket operated by the motor. Owing to the high rate of speed at which the spinning basket is being rotated the thread is hurled centrifugally outward against the side of the basket and is thus formed into skeins of desired proportions.

In practice it is customary to employ a group of spinning motors of which each one serves to spin one of a plurality of threads issuing from a common extruding device. As will be readily appreciated, therefore, it is essential that the several motors operate at a common speed and that such speed be nicely timed with respect to the rate of speed of extrusion.

It is accordingly an object of the present invention to assure the operation of each one of a group of pressure fluid actuated motors of given size and capacity at the same predetermined speed.

Another object is to provide a durable and rugged spinning motor of simplified construction which may operate with a minimum of attention and with a minimum of expense of maintenance and operation.

Other objects will be in part obvious and in part pointed out hereinafter.

In the accompanying drawing illustrating the invention and in which similar reference numerals refer to similar parts,

Figure 1 is an elevation, in section, of a motor constructed in accordance with the practice of the invention, and

Figure 2 is a transverse view taken through Figure 1 on the line 2—2.

Referring more particularly to the drawing, 20 designates a motor constructed in accordance with the practice of the invention and 21 a spinning basket which the motor is intended to rotate.

The motor comprises a casing 22 having a chamber 23 containing a turbine wheel 24, of the reaction type, keyed to a shaft 25 disposed vertically in the casing 22 and in a head 26 seated on top of the casing and secured thereto by bolts 27. The upper end of the shaft 25 extends exteriorly of the head 26 and into a socket 28 in the spinning basket 21.

Disposed about the casing 22 and in sealing relationship therewith is a sleeve 29 which cooperates with the casing 22 to define a supply chamber 30 for pressure fluid whereby the turbine wheel 24 is actuated. The lowermost end of the chamber 30 constitutes an inlet opening 31 which is in direct communication with the interior of a conduit 32 which may be connected to a source of pressure fluid supply and upon which the motor is mounted. The conduit 32 is accordingly provided with a lateral projection 33 having a flange 34 at its free end to serve as a seating surface for the base of the casing 22.

The casing may be secured to the flange 34 in any suitable and convenient manner, as for instance by bolts 35. Thus, as will be seen, the chamber 30 will be in constant communication with the source of pressure fluid and an ample volume of pressure fluid will, therefore, be constantly available in the chamber 30 for actuating the turbine wheel 24.

In the casing 22 and, more specifically, in the plane of the wheel 24 are a series of volute passages 36 which afford communication between the chamber 30 and the passages 37 in the wheel 24. The passages 37 and the vanes 38 defining them may be of well known types and in the head 26 is a discharge chamber 39 to receive the fluid issuing from the passages 37 and whence such fluid may pass to the atmosphere through a discharge passage 40, also in the head 26.

As will be readily appreciated, in systems employing a plurality of pressure fluid actuated spinning motors of a given type and size it is possible that, owing to slight mechanical variations in their construction, the motors may operate at slightly different maximum speeds. Inasmuch as it is required that the motors employed for rotating spinning baskets all operate at as nearly the same speed as is possible it is essential that means be provided to effect this mode of operation. The means provided, in the present instance, to accomplish this result consists of a bolt 41 which serves the dual function of securing the head 26 to the casing 22 and also to control the capacity of one of the volute passages 36.

The bolt 41 extends through a hole 42 in the head 26. It is threadedly connected to the casing 22 and extends into the inlet end of a passage 36. The bolt is of insufficient diameter to completely close the passage so that pressure fluid may at all times flow past the bolt to the turbine wheel. The bolt merely serves to reduce the flow

area of the volute passage and being threaded into the casing 22 may readily be retracted from or advanced into the passage to cause the motor to run at the same rate of speed as the other motors of the group.

The bolt 41 is of such length that a portion thereof extends above the head 26 and on the projecting portion of the bolt is a nut 43 which, when threaded down upon the head 26, serves to clamp the head against the casing 22 at that point.

As a preferred mode of construction the shaft 25 is journalled in anti-friction bearings 44 and 45 disposed in the head 26 and the casing 22, respectively. Seated on the inner race of the bearing 45 is a retaining ring 46 which serves as a support for the wheel 24.

The lowermost end of the shaft 25 projects below the bearing 45 and into an oil reservoir 47. Thus, during the operation of the motor the shaft 25, by its rotary movement in the reservoir 47, will agitate the oil and oil vapor thus created will be deposited upon the elements of the bearing 45 and lubricate them.

Likewise, means are provided for effecting lubrication of the bearing 44. To this end an oil reservoir 48 is formed in the head 26 to supply oil, through a suitable passage 49, to an annular chamber 50 encircling the shaft 25. An agitator or flinger 51 on the shaft 25, and which may be suitably affixed thereto, extends into the annular chamber 50 to actuate and force the oil through a passage 52 in the head 26 and a cover plate 53 to the bearing 44. The oil is delivered to the upper end of the bearing 44 and upon passing between its races again returns to the reservoir 48.

In order to prevent the leakage of oil from the various passages and chambers constituting the oiling system for the bearing 44 along the shaft 25 into the discharge chamber 39 a sleeve 54 is disposed about the adjacent portion of the shaft and seated in the head 26. The sleeve is of larger diameter than the shaft to avoid contact between the two and the upper end of the sleeve, which extends into the flinger 51, is sealed by a plate 55.

As a preferred form of construction the bearing 44 is mounted in a cushioning member 56 to prevent the transmission of vibration from the shaft 25 to the motor casing. The cushioning member 56 may consist of rubber or other suitable resilient material and consists of a ring or rings which are seated in a recess 57 in the outer end of the head 26. A sleeve 58 is interposed between the outer race of the bearing 44 and the cushioning member to cooperate with the head 26 for retaining the cushioning member in the correct assembled position with respect to the bearing.

In operation of the device the pressure fluid is conveyed from the source of supply to the motor or motors 20 by the conduit 32. Such pressure fluid passes directly from the conduit through the inlet opening 31 into the chamber 30, thence through the volute passages 36 into the passages 37 of the turbine wheel for actuating it. Upon passing through the turbine wheel the pressure fluid is discharged into the chamber 39 thence passes to the atmosphere through the passages 40.

In the event that the speeds of the motors of a group may not be uniform the bolt 41 may be adjusted to either increase or decrease the capacity of the volute passage 36 into which it extends, thereby making it possible to bring the speed of each motor to the exact rate of that of the other motors.

We claim:

1. A pressure fluid actuated spinning motor, comprising a casing consisting of a plurality of parts, a vertical shaft in the casing, a reaction turbine on the shaft for rotating the shaft, passages in the casing for conveying pressure fluid to the turbine wheel, and single means for securing the casing parts together and for varying the capacity of one of the passages.

2. A pressure fluid actuated spinning motor, comprising a casing having a motor chamber, a vertical shaft in the casing, a head for the motor chamber, a reaction turbine in the motor chamber for rotating the shaft, passages in the casing for conveying pressure fluid to the turbine, and a bolt for securing the head to the casing extending into one passage and being adjustable for varying the capacity of the said passage.

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