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Shadley

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[54] **SHAFT SUPPORT ARRANGEMENT FOR APPLIANCE HAVING A ROTATING CYLINDER**

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[52] **U.S. Cl.** **34/139,** 34/133

[51] **Int. Cl.** **F26b 11/02**

[58] **Field of Search** ..... 34/133, 139, 58; 308/19 T, 308/207

[56] **References Cited**

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[57] **ABSTRACT**

A unique shaft support arrangement for an appliance having a rotating cylinder is provided. The back wall of the cylinder includes a central piloting hole adapted to receive a screw for engagement with one end of the torque transmitting shaft and permit alignment of the cylinder relative to the shaft axis. A disk is brazed or welded to the shaft close to the one end. A shaft support in the form of a frusto-conical member surrounds the shaft and has its larger diameter base abutting the disk and its smaller diameter base abutting the inner race of a bearing secured to the frame of the appliance. A plurality of screws secure the cylinder back wall, disk, and large diameter base of the shaft support to each other thereby enabling torque to be transmitted to the cylinder through the shaft while insuring that the cylinder remains in axial alignment with the shaft. The other end of the shaft extends through the bearing to receive a sprocket wheel which delivers torque from the appliance motor.

5 Claims, 4 Drawing Figures

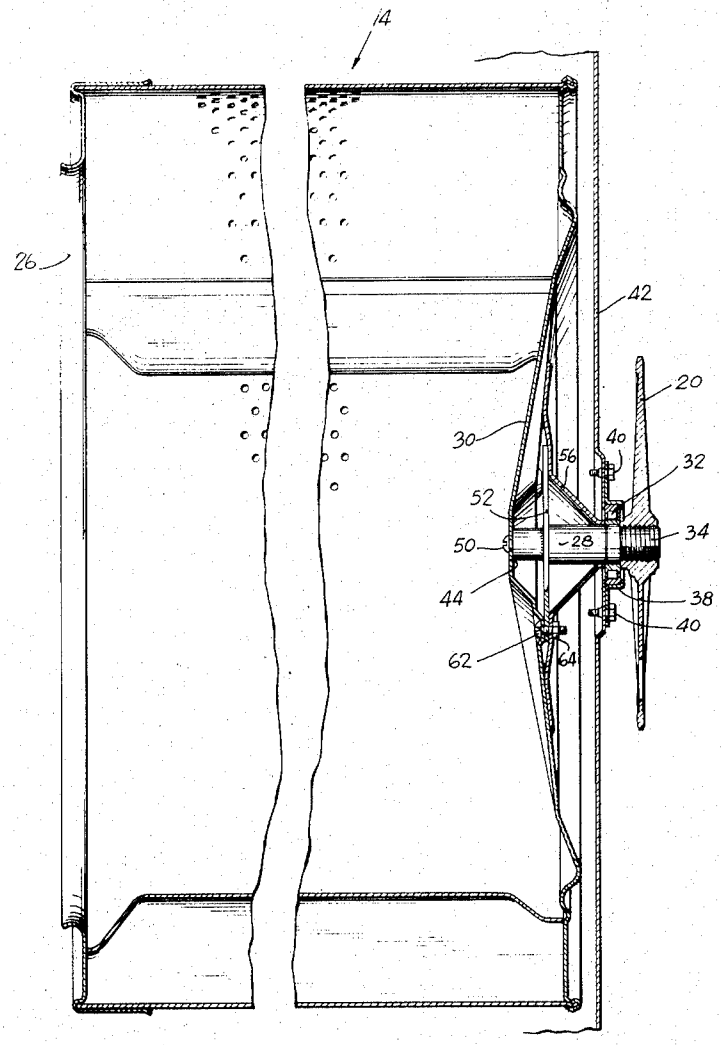


Fig. 1

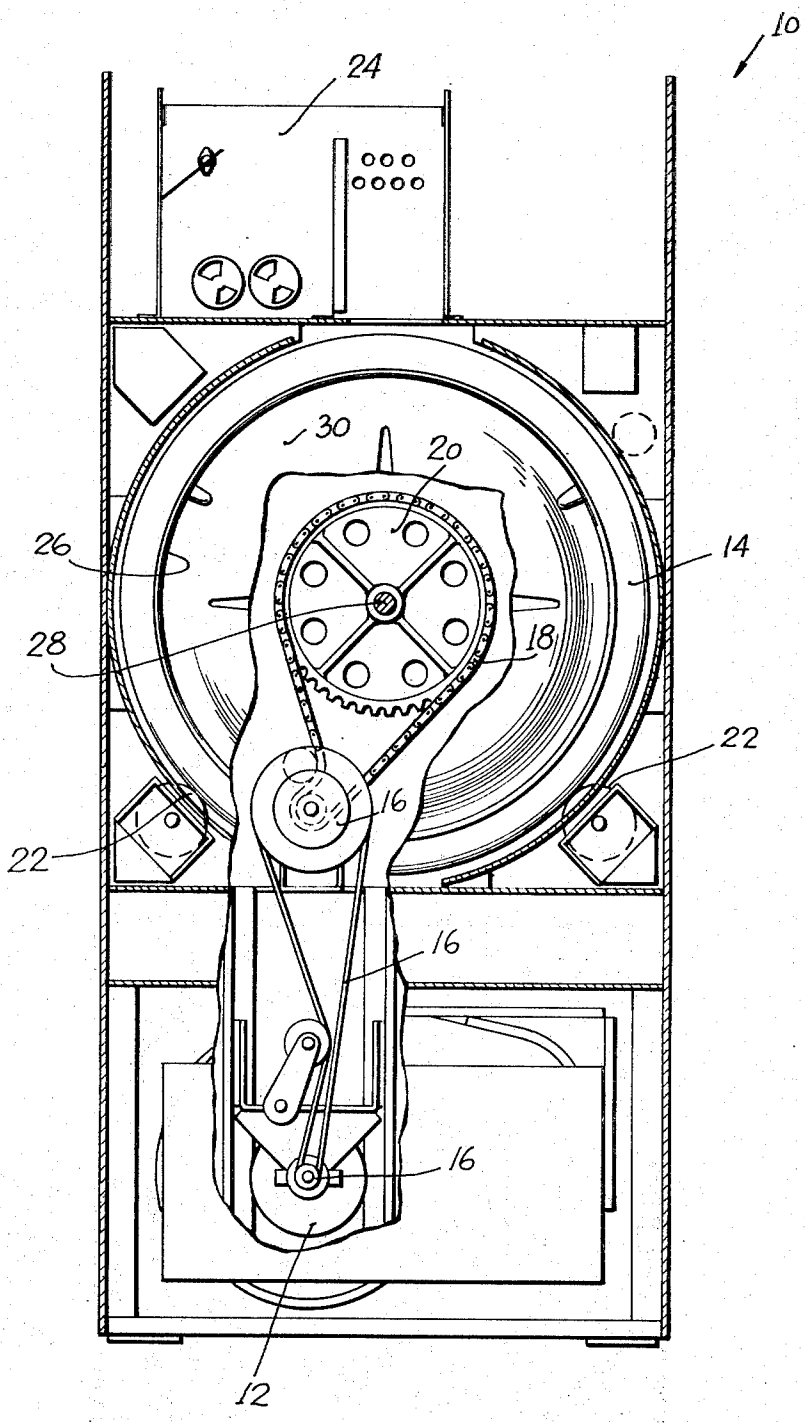


Fig. 2

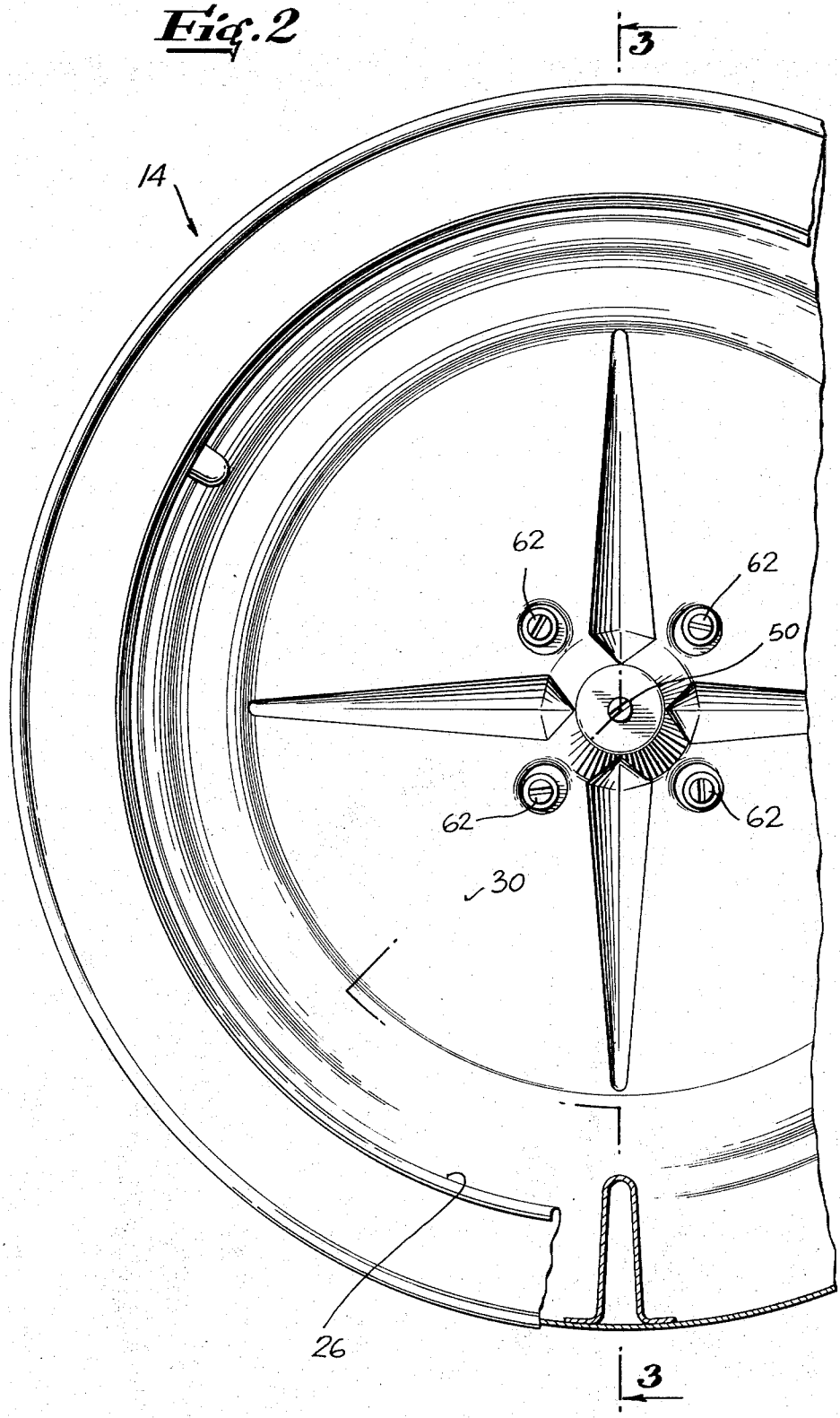


Fig. 3

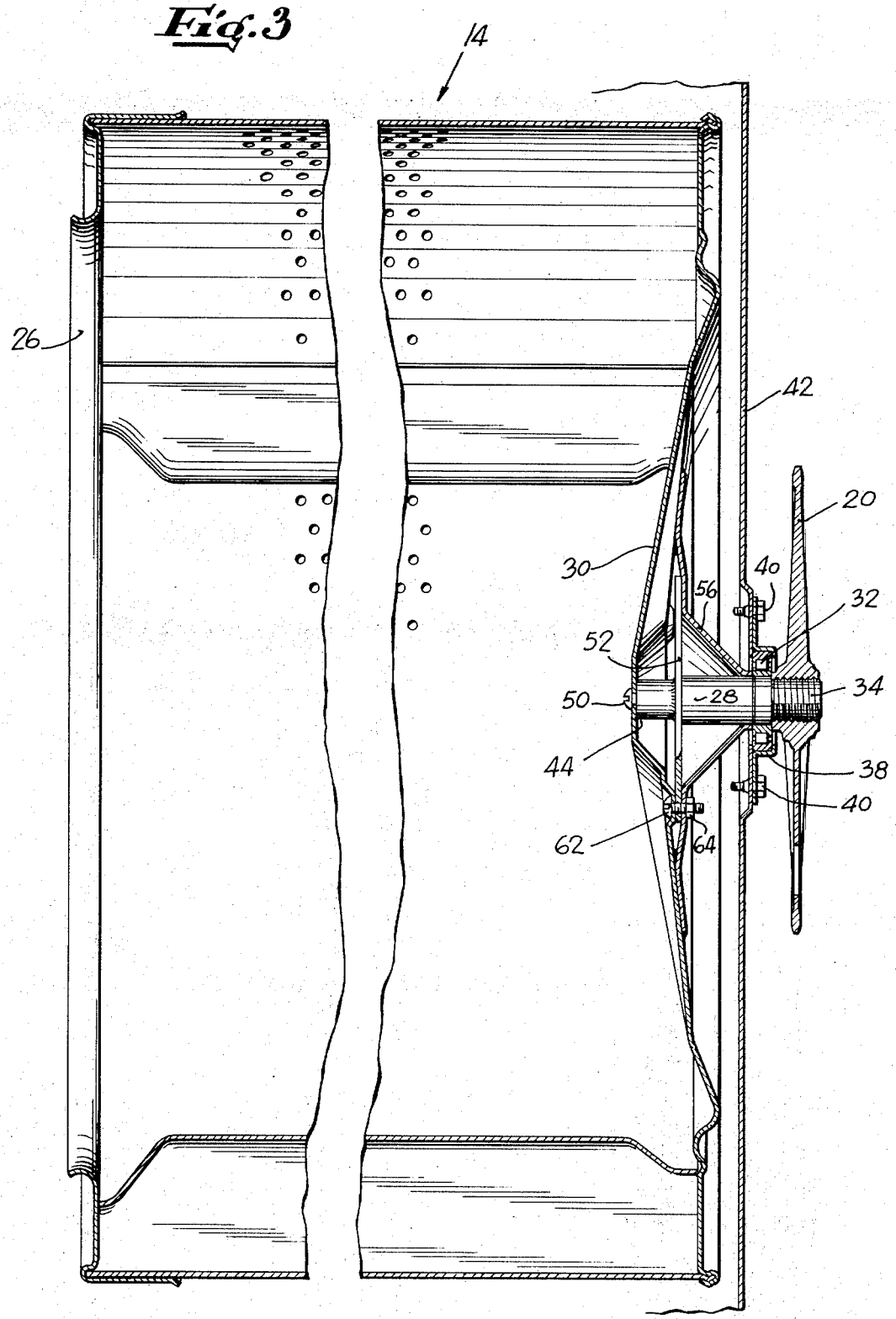
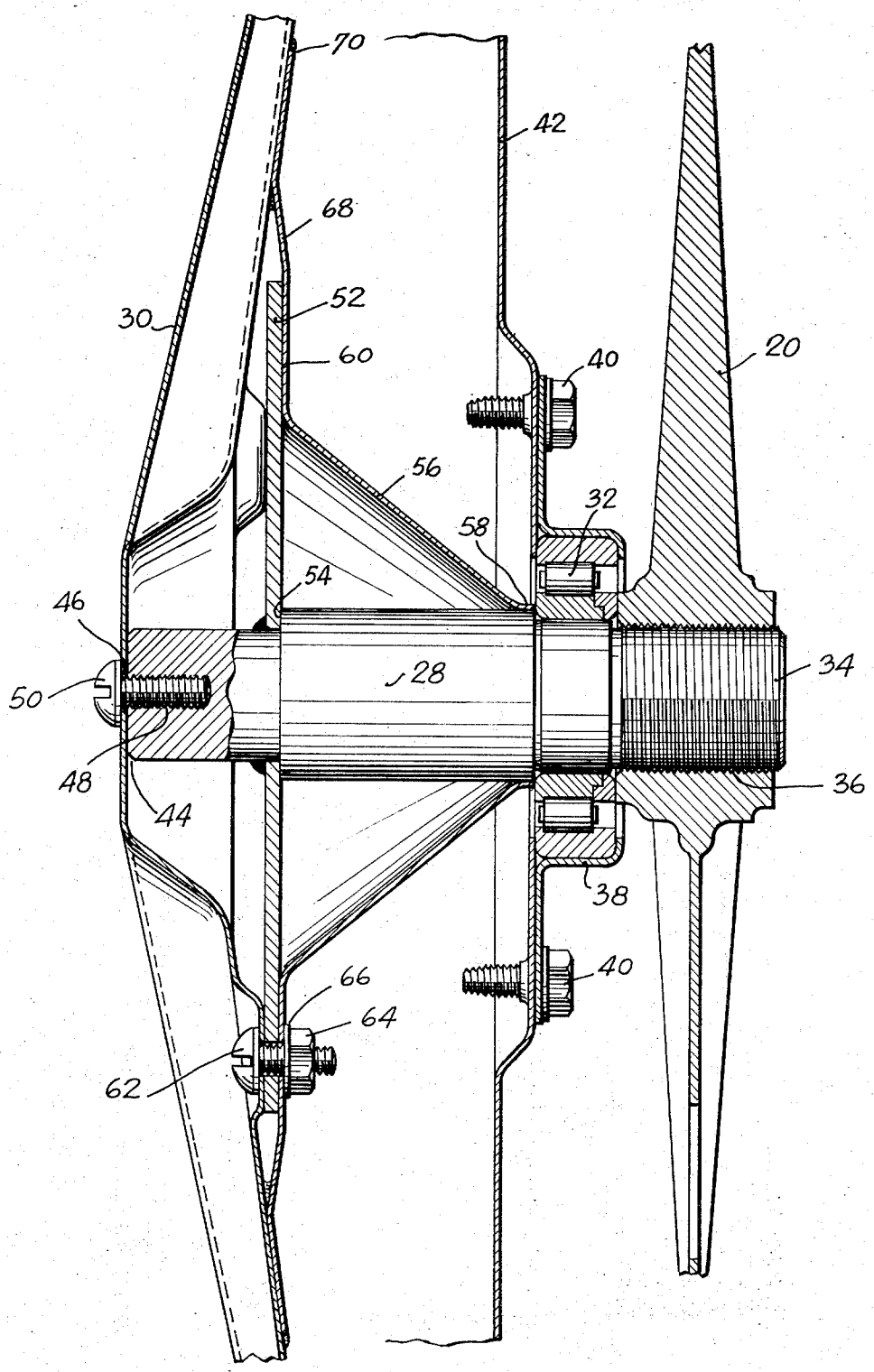


Fig. 4



SHAFT SUPPORT ARRANGEMENT FOR APPLIANCE HAVING A ROTATING CYLINDER

BACKGROUND OF THE INVENTION

The present invention relates to appliances of the type having a rotating cylinder and more particularly to an arrangement for assuring parallel alignment between the axis of the cylinder shaft and the axis of the cylinder.

Many appliances make use of a rotating drum or cylinder. Such an appliance is the clothes dryer where there is provided a cylinder designed to receive wet clothes to be dried and to rotate during the drying operation. The cylinder must be coupled to a shaft which, in turn, is driven by the dryer motor. In order to minimize vibrations and to insure smooth operation, it is important that the shaft axis and cylinder axis be properly aligned and maintained in parallel alignment throughout its years of use. This is especially so in view of the fact that the shaft cannot extend into the cylinder and thus, the cylinder must be cantilevered from one end of the shaft.

In view of the above, it is the principal object of the present invention to provide an improved arrangement for an appliance which enables parallel alignment of the appliance cylinder and shaft axis and insures the alignment being maintained.

SUMMARY OF THE INVENTION

The above and other beneficial objects and advantages are attained in accordance with the present invention by providing an appliance of the type having motor means, a cylinder adapted to be rotated about its longitudinal axis by the motor means, shaft means adapted to support the cylinder and drive means adapted to transmit torque from the motor to the cylinder with a unique shaft supporting arrangement adapted to insure the parallel alignment of the cylinder axis and shaft axis. The support means of the present invention includes a plate disposed about the shaft at one end and rigidly secured to the shaft. A single ball bearing is fixed to the appliance framework and supports the shaft adjacent its opposite end. A frustoconical shaft supporting member closely fits about the shaft and is co-extensive with the shaft extending between the bearing and the plate with the small diameter end of the member abutting the inner race of the bearing and the large diameter end of the member abutting the plate. Means are provided for coupling the cylinder rear wall, plate and shaft support to each other after parallel alignment has been first established. To this end, pilot holes are provided in the rear wall of the cylinder and the one end of the shaft which enable the cylinder to be properly aligned with the shaft on an appropriate fixture. After the cylinder and shaft are properly aligned, the coupling means serves to insure that the alignment is maintained during prolonged years of use and operation.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

FIG. 1 is a partly fragmentary rear elevational view of a dryer in accordance with the present invention wherein the cabinet has been removed to more readily depict the area of concern;

FIG. 2 is a fragmentary elevational view of the clothes receiving drum or cylinder of the dryer looking at the cylinder rear wall from the front of the cylinder interior;

FIG. 3 is a side elevational sectional view taken along reference lines 3—3 in the direction indicated by the arrows on FIG. 2 and depicting the dryer cylinder and shaft support arrangement of the present invention; and,

FIG. 4 is an enlarged fragmentary view similar to FIG. 3 depicting the specific shaft support arrangement of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Reference is now made to the drawings wherein similar components bear the same reference numerals throughout the several views. In particular, reference is made to FIG. 1 wherein a dryer **10** is shown with portions of the outer cabinet removed. The dryer includes a motor **12** designed to rotate a perforated cylinder or drum **14** adapted to receive wet clothes to be dried. To this end, the motor torque is transmitted to the cylinder through a series of belts and pulleys generally designated **16** which drive a chain **18** which, in turn, drive a sprocket wheel **20** at the rear of cylinder **14.** Suitable bearing rollers **22** cooperate in supporting the dryer cylinder as it is rotated. Heat for the clothes to be dried is provided by a gas fired combustion chamber **24** located at the top of the dryer.

Access to the interior of cylinder **14** is provided through an opening **26** in the front of the dryer designed to be closed by an appropriate door (not shown). The various other operational features of the dryer are not material to the present invention and hence need not be discussed further.

As shown in FIG. **4,** the dryer cylinder is supported for rotation by a shaft **28** coupled to the rear wall **30** of the cylinder. Shaft **28** is supported for rotation by ball bearing **32** and is rotated by operation of the motor through sprocket wheel **20** threadedly fastened to end **34** of the shaft. To this end, the threads **36** of the shaft and corresponding threads of the sprocket wheel are such that rotation of the sprocket wheel by operation of the motor serves to tighten the engagement between the shaft and sprocket wheel. As shown, bearing **32** is secured by bearing housing **38** and bolts **40** to a member **42** fixed with respect to the dryer framework.

The front end **44** of shaft **28** abuts against the rear wall **30** of cylinder **14.** A pilot hole **46** is provided in the rear wall of the cylinder and a threaded pilot hole **48** extends rearwardly along the longitudinal axis of shaft **28** from the shaft forward end **44.** The cylinder is secured to the shaft by a bolt **50** passing through hole **46** and engaging the threaded hole **48** of the shaft.

In accordance with the present invention, a plate **52** of heavy gauge metal encircles the shaft and is rigidly brazed or welded in position against shoulder **54** close to the front end of the shaft. Plate **52** is so positioned along the shaft so as to abut the rear wall **30** of the cylinder when the pilot bolt **50** is in position. A frustoconical shaft support member **56** fits about the shaft for the full length of the shaft between plate **52** and bearing **32.** In this connection, it should be noted that the smaller diameter base **58** of member **56** abuts the inner race of bearing **32** and the larger diameter base **60** abuts plate **52.**

The larger diameter base **60** of member **56,** plate **52,** and the rear wall **30** of cylinder **14** are provided with a series of aligned holes through which screws **62** pass. Screws **62** cooperate with nuts **64** and washers **66** in coupling the cylinder rear, plate and shaft support member to one another. Since plate **52** is brazed or welded to shaft **28,** the plate will rotate with the shaft and the shaft's torque may thus be transmitted through screws **62** to the cylinder. As shown in FIG. **2,** four coupling screws **62** are provided disposed at equal arc segments along a common circle. Referring back to FIG. **4,** it should be noted that the large base **60** of member **56** includes a portion **68** extending beyond the common circle which continues to a free end **70** beyond the edge of plate **52** and abutting the rear wall **30** of cylinder **14.** An epoxy bonds the base to the rear wall of the dryer.

During assembly, the cylinder is secured to the shaft by screw **50** passing through holes **46** and **48** while the cylinder and shaft are supported in a suitable fixture to insure alignment. The four screws **62** and their associated nuts **64** are then tightened. During operation, torque from the shaft to the cylinder is transmitted via the screws **62.** By employing the above described arrangement, it has been found that alignment of the shaft and cylinder can be maintained even after long periods of use and, accordingly, the aforementioned objectives are attained.

Having thus described the invention, what is claimed is:

1. In a domestic appliance of the type having a framework containing therein motor means, a cylinder adapted to be rotated about an axis by said motor means, said axis extending between the front and rear of said cylinder, shaft means adapted to support said cylinder, and drive means adapted to transmit torque from said motor to said cylinder the improvement comprising support means for said shaft adapted to insure the parallel alignment of the cylinder axis with the longitudinal axis of the shaft, said support means including: a plate disposed about said shaft at one end and rigidly secured to said shaft, bearing means secured to said framework and supporting the shaft near the other end, a shaft supporting member encircling said shaft and coextensive with the shaft between the bearing and plate, and means for coupling said cylinder rear, plate and support to each other.

2. The invention in accordance with claim **1** further comprising a first pilot hole in said cylinder rear, a second, threaded pilot hole in said shaft one end and bolt means adapted to secure said cylinder rear to said shaft one end through said pilot holes.

3. The invention in accordance with claim **1** wherein said bearing means comprises a ball bearing having an inner race and said shaft support means comprises a frusto-conical member closely fitting about said shaft and having its inner diameter base abutting said inner race and its larger diameter base abutting said plate.

4. The invention in accordance with claim **3** wherein said coupling means comprises a plurality of screws and nuts passed through aligned openings through said cylinder rear, plate and large diameter base disposed along a common circle at equal angle intervals.

5. The invention in accordance with claim **4** wherein said large diameter base includes an integral portion extending beyond said common circle wherein siad portion is secured to said cylinder rear wall independently of said screws and nuts.

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