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McDonald et al.

[11] **3,832,582**

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[54] **MOTOR WITH IMPROVED OIL SUPPLY DEVICE ON SHEET METAL ENDBELL**

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[52] **U.S. Cl.** **310/90,** 308/132

[51] **Int. Cl.** **H02k 5/22**

[58] **Field of Search** 308/132; 310/89, 90

[56] **References Cited**

UNITED STATES PATENTS

2,792,512	5/1957	Koch	310/90 X
3,264,045	8/1966	Tupper	308/132 X
3,500,087	3/1970	Wendt	310/90
3,704,923	12/1972	Rajna	308/132

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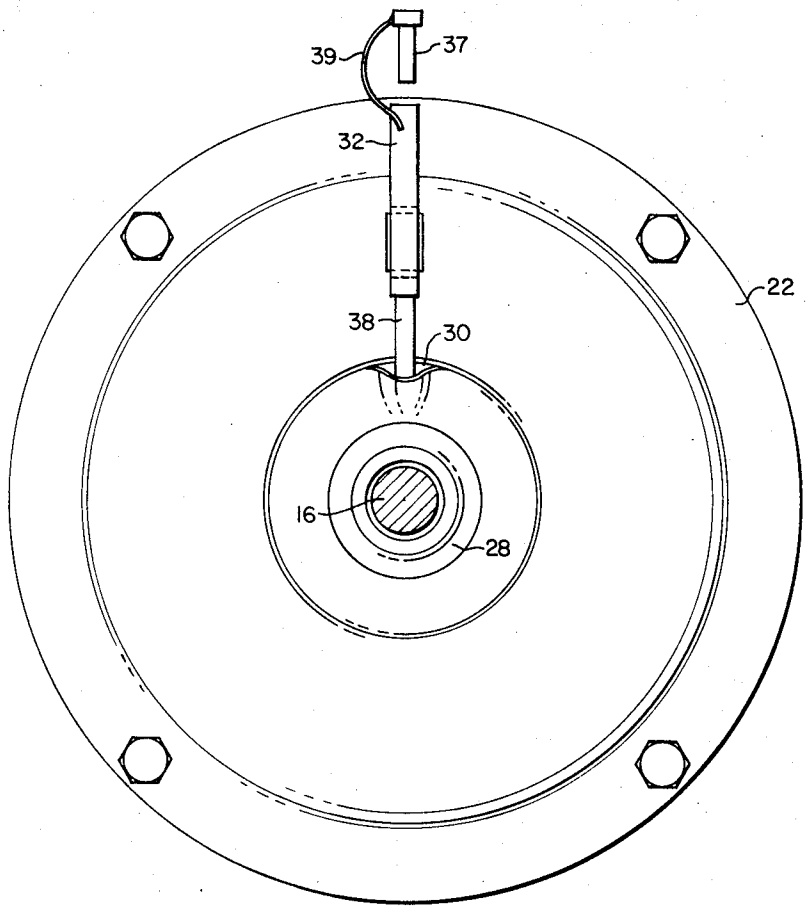
[57] **ABSTRACT**

The endbell of a motor is of stamped sheet metal including a cup-shaped central portion surrounded by a flange-like outer portion which is secured to the stator and which supports a device for providing an oil passageway to a centrally located bearing. The cup-shaped endbell portion is part of the bearing housing that also includes a second cup-shaped member disposed within the first cup-shaped portion in opposite facing relation. The two cup-shaped elements have shaft receiving apertures and contain a bearing and oil retaining wicking material. One of the cup-shaped elements has an additional aperture off the shaft axis. The oiler device is a unitary member of molded plastic material; it is snap fit, without fasteners, in an aperture in the flange portion of the endbell and has an extremity in the aperture of one of the cup-shaped elements. The outer extremity of the oiler device is proximate the radial extremity of the endbell.

4 Claims, 3 Drawing Figures



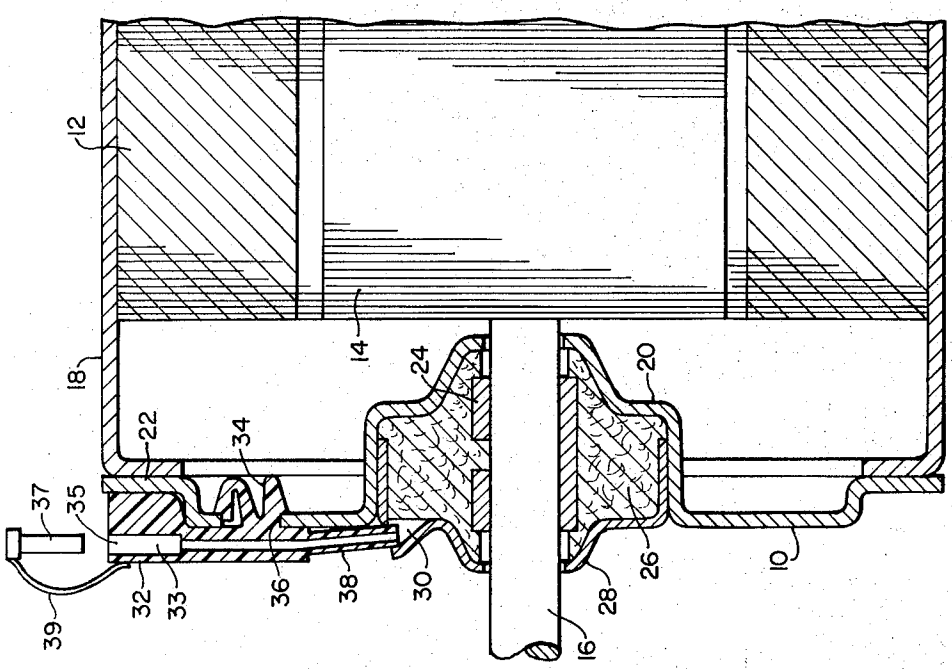

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FIG. 1.

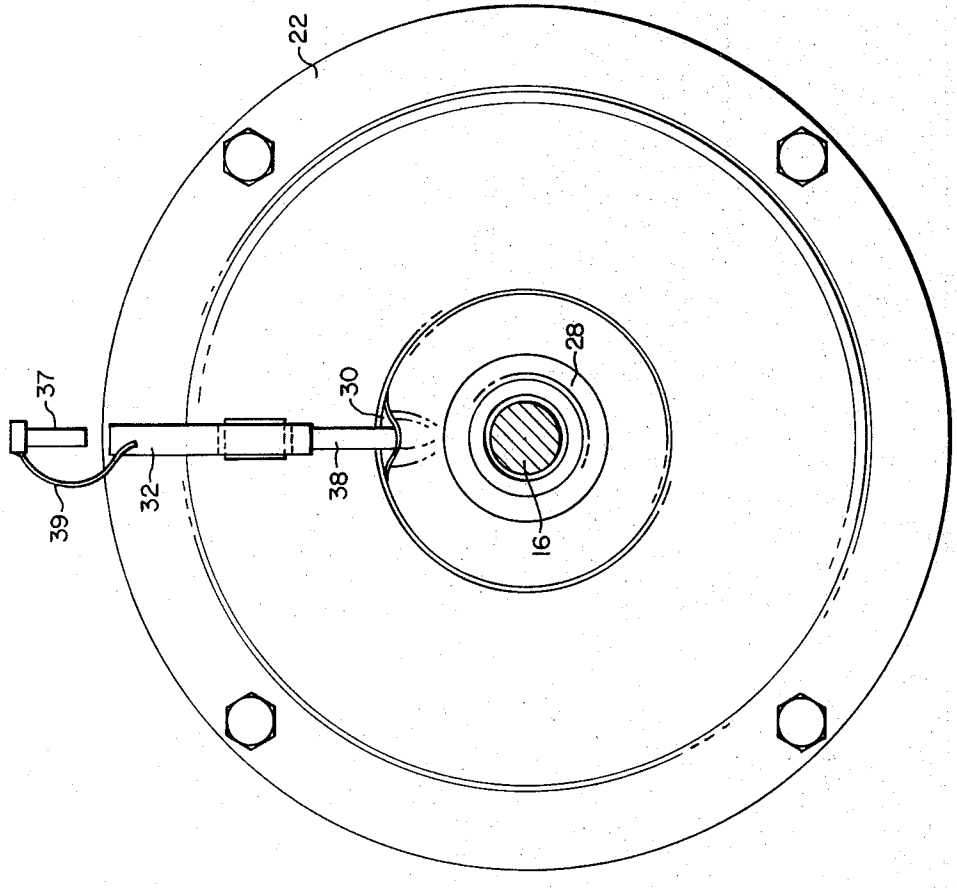
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FIG. 2.

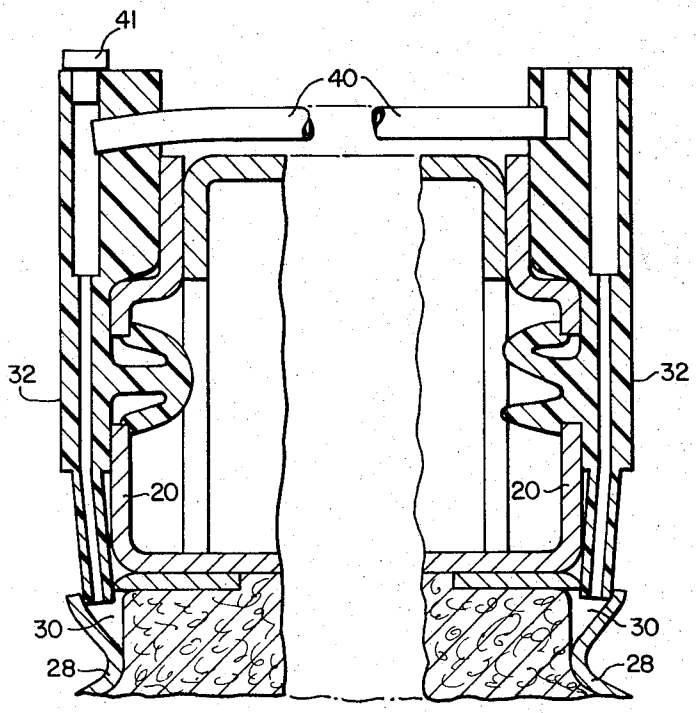

FIG. 3.

MOTOR WITH IMPROVED OIL SUPPLY DEVICE ON SHEET METAL ENDBELL

BACKGROUND OF THE INVENTION

This invention relates generally to dynamoelectric machines and particularly to motors with bearing reservoirs requiring a lubricant supply.

Conventional configurations for the application of oil to motor bearings includes that in which the oil is admitted to a bearing housing essentially directly at a location near the axis of the machine. It is sometimes awkward or impossible to reach such a location. Consequently there has also been conventional configurations in which the oil can be supplied at or proximate the radial periphery of the motor. For example, there are machines in which a radial oil passageway is provided through the interior of a cast metal endbell. This imposes considerable difficulty and expense in the casting of the endbells.

Motors have been previously known in which the endbells are comprised of stamped sheet metal. While providing economy of formation as opposed to cast endbells, a stamped endbell renders it impossible to form an oil passageway to the radial periphery of the machine at the same time the endbell is formed. Thus, prior machines with stamped sheet metal endbells are sometimes provided with a formed metal tube of brass or the like secured to the endbell by additional fasteners.

The requisite of a separate metal tube and securing means therefor detracts considerably from the economy intended to be effected by the use of a stamped endbell. Such economic considerations are important or even vital to the success of a modification in the manufacture of fractional horsepower motors which are required in such large numbers for numerous applications.

Other prior art mentioned by way of example as additional background to the present invention includes Niles U.S. Pat. No. 3,311,196, Mar. 28, 1967 and Wendt U.S. Pat. No. 3,500,087, Mar. 10, 1970.

In Niles each end frame has an interior radial passageway communicating between a lubricant reservoir at the bearing and the exterior of the machine at its radially outer perimeter. A lubricant fitting is plugged radially into an outer end of the passageway and is connected by a tube to a similar fitting at the other endbell to permit supply of oil to both bearings from a single end of the motor. Thus, Niles' improved element is for communication of lubricant between the two ends of the motor rather than between the motor periphery and the bearing housing itself.

In Wendt, a self-contained lubricant reservoir is mounted onto the motor end frame by hook projections extending into slots in the end frame, the reservoir having an axial opening fitting over the bearing location. The Wendt patent does not concern itself with means for admitting new lubricant to the bearing but rather contemplates replacement of the lubricant reservoir as needed for replenishment.

SUMMARY OF THE INVENTION

It was in an effort to provide an economical motor configuration having the advantages of stamped sheet metal endbells and yet having an oiler accessible from the radial extreme of the motor that the present invention came about.

In accordance with this invention, the endbell is of stamped sheet metal including a cup-shaped central portion surrounded by a flange-like outer portion which is secured to the stator. The cup-shaped portion is part of the bearing housing that also includes a second cup-shaped member disposed within the first cup-shaped portion in opposite facing relation. The two cup-shaped elements have shaft receiving apertures and contain a bearing and, usually, oil retaining wicking material. One of the cup-shaped elements has an additional aperture of the shaft axis. An device with a tubular passageway is snap fit, without fasteners, in an aperture in the flange portion of the endbell and has an extremity in the aperture of one of the cup-shaped elements. The outer extremity of the oiler device is proximate the radial extremity of the endbell. The oiler is preferably a unitary member of molded plastic material.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial sectional view of one embodiment of an electric motor incorporating the present invention;

FIG. 2 is an end view of the embodiment of FIG.1; and

FIG. 3 is a partial view of another form of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIGS. 1 and 2, a dynamoelectric machine, for example, a fractional horsepower motor, is provided with an enclosure that includes at at least one end, and preferably both ends, an endbell **10** and associated elements of a configuration in accordance with this invention.

There is schematically shown in FIG. 1 the relative location of a motor stator **12,** rotor **14** and shaft **16** on which the rotor rotates, as well as a frame portion **18** on which the stator is secured and in turn secured to the endbell **10,** such as by through bolts (not shown).

The endbell **10** itself is of a sheet metal, conveniently steel, formed, as by stamping, to have a cup-shaped central portion **20** surrounded by a radially extending flange-like portion **22** secured to the frame **18.** The cup-shaped central portion **20** serves as part of a housing for containing a bearing **24,** and preferably also bearing lubricant wicking material **26.** The bearing housing also comprises a second cup-shaped member **28** whose rim is secured within the cup-shaped central portion **20** of the endbell. The two cup-shaped elements **20** and **28** have aligned apertures for shaft **16.** One of the cup-shaped elements, here the second cup-shaped member **28** also has an aperture **30** radially displaced from the axis.

An oiler device **32** is provided of a unitary member having a tubular passageway **33.** The body of oiler **32** is disposed against a surface of the flange-like portion **22** of the endbell and is retained thereon by a projec-

tion **34** that is locked by a snap fit within an aperture **36** in the flange-like portion. The oiler body includes a stem-like portion **38** with an extremity within the additional aperture **30** of the cup-shaped element **28.** The oiler device is preferably of a molded plastic material such as polypropylene, nylon, or any other low-cost material that is compatable with the lubricant to be used.

The snap lock projection **34** of the oiler device **32** may be variously configured in order to provide adequate securing of the device to the endbell merely by the application of thumb pressure without requiring any additional fasteners. The configurations of the locking projection of FIGS. **1** and **3** are merely examples of those suitable for the intended purpose.

The outer surface portion of the oiler device **32** may be smoothly curved and the inner surface flat or otherwise configured to rest against the contour of the endbell surface when assembled. Inlet hole **35** at the outer extremity of the oiler device is preferably large enough to accommodate any reasonably expected oil dispenser and preferably has a plug **37.** The plug is preferably integrally joined by a flexible element **39** to the main portion of the oiler device **32.**

The stem portion **38** of the oiler device **32** is smaller in outside diameter than the main body portion of the device so that while the main body is relatively rigid, the stem **38** is relatively flexible and can be readily placed within the opening **30** of the cup-shaped element. A lanced portion of the cup-shaped element **28,** as shown, may be employed to provide opening **30** for the admission of lubricant to the bearing reservoir. Alternatively, merely a pierced hole within the bearing reservoir may accommodate the flexible stem end.

In assembly, after completion of the motor enclosure the oiler device would be combined therewith by first inserting the stem **38** of the oiler **32** into the aperture **30** entering the bearing housing; and, second, using finger pressure, forcing the snap lock extension **34** into the mating hole **36** of the endbell face **22,** thus completing the assembly.

In FIGS. **1** and **2,** the oiler device **32** essentially extends only to the radial extreme of the motor housing. In FIG. **3,** it will be noted that a motor is shown in which oiler devices **32** and endbells generally in accordance with this invention are provided at both ends of the motor and they extend somewhat beyond the radial periphery of the motor housing. This is for the purpose of accommodating a tube **40** interconnecting the two oiler devices for the purpose of permitting the application of lubricant to both bearings from a single end of the motor. The right-hand oiler **32** has a dual vertical inlet for lubricant. One inlet communicates with the passage to the right end bearing and the other inlet, through tube **40,** to the left end bearing. The left-hand oiler has a cap or plug **41** over its vertical passage.

It is therefore seen that the present invention provides a simple and economical endbell, bearing housing, and oiler device configuration particularly useful for small electric motors.

We claim as our invention:

1. A dynamoelectric machine comprising, in combination: an enclosure including an endbell of sheet metal having a cup-shaped central portion surrounded by a flange-like portion, said cup-shaped central portion forming part of a housing for containing a bearing; said bearing housing also comprising a separate cup-shaped member with a rim secured within said cup-shaped central portion, said cup-shaped member having a shaft aperture in alignment with a shaft aperture of said cup-shaped central portion, said housing also having an additional aperture in one of said cup-shaped elements; an oiler device of a unitary member having a tubular passageway through a body disposed radially against a surface of said flange-like portion and retained thereon by a projection locked within an aperture of said flange-like portion, said body including a stem-like portion with an extremity within said additional aperture.

2. The subject matter of claim **1** wherein: said enclosure includes an endbell, bearing housing and oiler device, as defined, at each of two axial extremities thereof.

3. The subject matter of claim **2** wherein: said oiler device extends outwardly proximate to the radial extreme of said endbell and a removable plug is provided within said passageway at the end of said oiler device.

4. The subject matter of claim **3** wherein: said oiler device at said two extremities of said housing are joined by tubing to permit the supply of oil to both bearing housings from a single end of the machine.

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