

United States Patent

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[54] **MOTOR HOUSING**
3 Claims, 7 Drawing Figs.

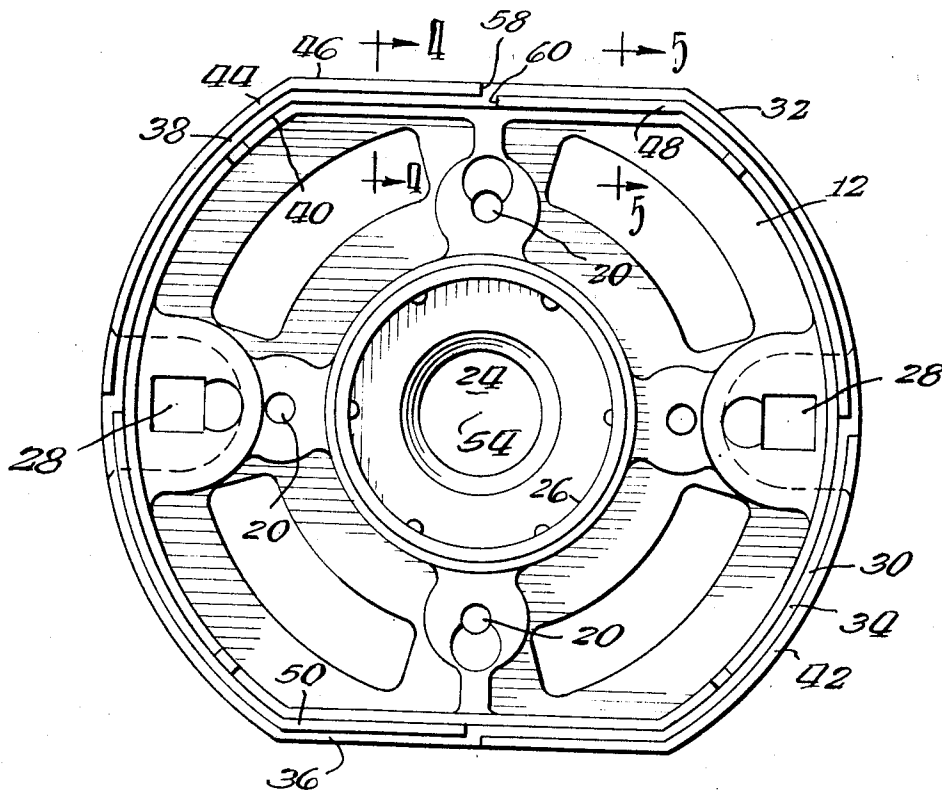
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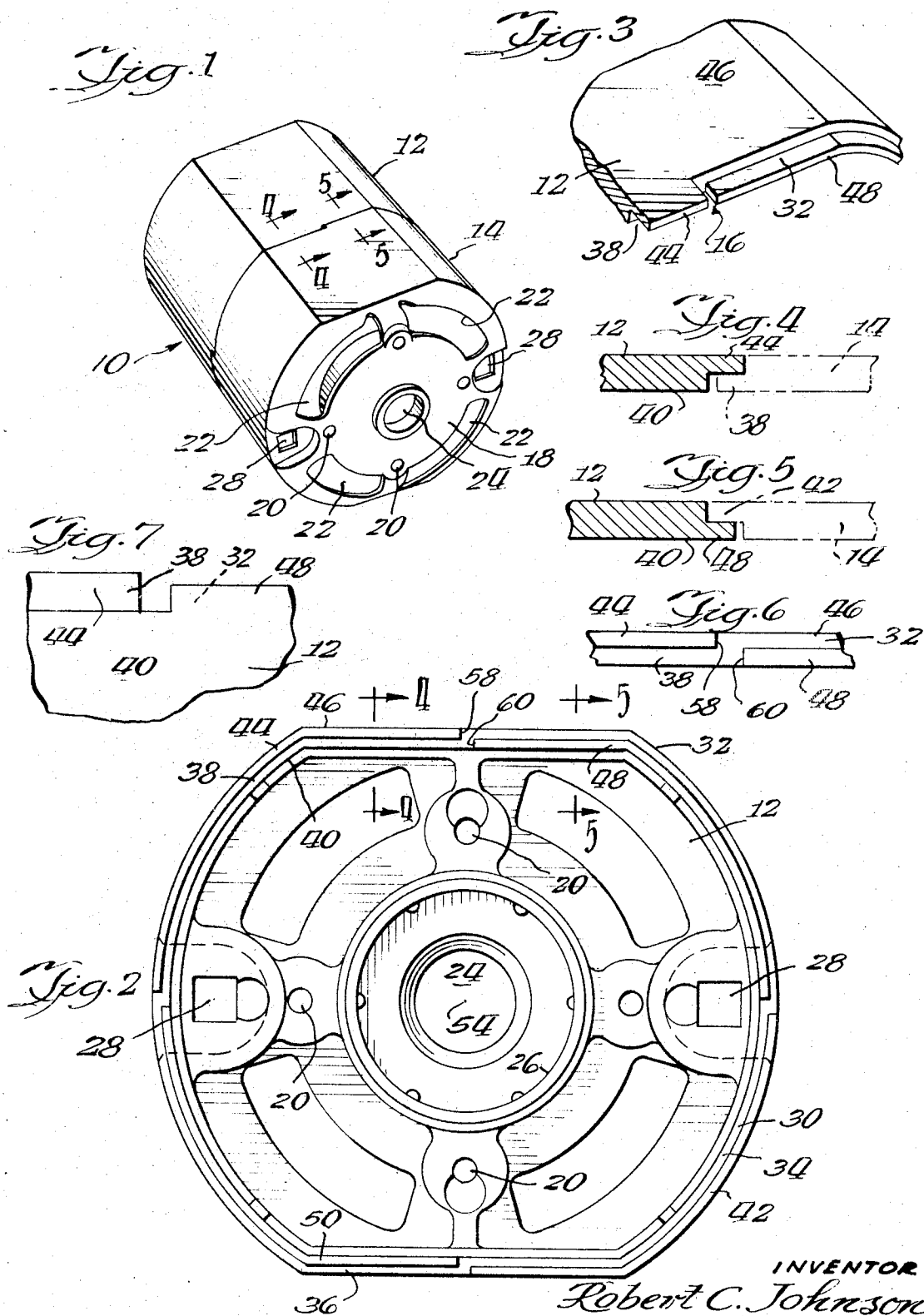
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ABSTRACT: A motor housing comprising a pair of cup-shaped housing frames, each of which is identical to the other. Each housing frame has an open end and a relatively closed end. The rim of each frame at its open end has an integrally formed flange and groove for interengagement with the flange and groove of the other frame when the rims of both frames are connected together.





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MOTOR HOUSING**BACKGROUND OF THE INVENTION**

This invention relates to a novel motor housing.

Small electrical motors are generally built with either drawn steel housings or die cast housings. Drawn steel housings are typically deep drawn steel cups that are side trimmed to a predetermined length and apertures of various configurations are punched into the cups. Both ends or frames of the motor housing may be identical, and the pieces are butt fitted against each other and fastened together by suitable connecting means.

One of the major advantages of the aforementioned type of motor housing is the efficiency resulting from having both ends of the motor identical to each other. In this manner all of the housing ends are interchangeable. However, drawn steel housings are disadvantageous because of the lack of possible variation with respect to the design configuration of the housing. Further, although a butt fit is generally desired, possible misalignment problems may occur thereby rendering one of the ends not useful. In addition, the cost of the housings resulting from this method of production is relatively high.

A more economical prior art type of housing is formed of either die cast aluminum or die cast zinc with each motor housing including two separate housing ends or frames. Generally one housing frame is cast with a shoulder and the other housing frame is cast with a corresponding recess. The advantages of this type of construction include flexibility of design configuration, relatively good alignment between parts resulting from the male-female fit, and the lower cost of the housings inherently resulting from casting techniques. However, a motor inventory must include both male and female housing frames, hence there is no interchangeability of parts as with the drawn metal-type housing mentioned above. Further, if one of the castings is imperfect and cannot fit the other casting, it will have to be discarded.

The novel motor housing of the present invention has all of the advantages concomitant to both of the types of housings mentioned above, by utilizing a unique configuration. The housing may be die cast with both housing frames formed identically.

Casting an essentially identical part for both ends of the motor has a significant manufacturing advantage in that it reduces the tooling costs, lowers the piece part costs by doubling the volume, and parts can be discarded without greatly unbalancing one's inventory, in contrast to the unbalance which would occur if a large number of prior art male castings were discarded while prior art female castings remained in the inventory. The ability to cast the housing of the present invention obviates the basic disadvantages of drawn housings mentioned above. The design configuration may be varied considerably. Misalignment problems are minimized and the cost of production is decreased.

BRIEF DESCRIPTION OF THE INVENTION

In accordance with the present invention, there is provided a motor housing comprising a pair of cup-shaped housing frames. Each of the housing frames is identical to the other and has an open end and a relatively closed end. The rim of each frame at its open end has a projection and recess for interengagement with the projection and recess of the other frame when the rims of both frames are connected together.

In the illustrative embodiment of the invention, the rim of each frame at its open end defines an even number of rabbets with one-half the total number of rabbets being reverse-positioned with respect to the other half to form said even number of rabbet joints when the rims of both frames are interengaged.

In the illustrative embodiment, one-half the total number of rabbets are formed on the inner surface of the frame to provide first extending flanges which are substantially contiguous with the outer surface of the frame. The other half of the total number of rabbets are formed on the outer surface of the

frame to provide second extending flanges which are substantially contiguous with the inner surface of the frame. The rabbets are symmetrically arranged about the rim with respect to the central axis of the opening defined by the rim, and in this manner the rim of one frame can be interengaged with the rim of the other frame to form said total number of rabbet joints.

BRIEF DESCRIPTION OF THE DRAWINGS

A more detailed explanation of the invention is provided in the following description and claims, and is illustrated in the accompanying drawing, in which:

FIG. 1 is a perspective view of a motor housing in accordance with the principles of the present invention, with both housing frames interengaged with each other;

FIG. 2 is an end elevational view of one of the housing frames of FIG. 1, looking at the open end of the housing frame;

FIG. 3 is a fragmentary perspective view of a portion of the rim of one of the housing frames of FIG. 1;

FIG. 4 is a fragmentary sectional view, taken along the line 4-4 of FIG. 1;

FIG. 5 is a fragmentary sectional view, taken along the line 5-5 of FIG. 1;

FIG. 6 is a fragmentary elevational view of a portion of the rim of the housing frame of FIG. 2; and

FIG. 7 is an enlarged fragmentary bottom view of the housing frame portion illustrated in FIG. 3.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT OF THE INVENTION

The motor housing 10 comprises a housing frame 12 and a housing frame 14, each of which is die cast and identical to the other. Housing frames 12 and 14 are generally cup-shaped and each has an open end 16 and a relatively closed end 18, and a plurality of integral wall members including a pair of opposed planar wall members 19 interconnected by a pair of opposed arcuate wall members 19', the wall members 19, 19' extending from the open end 16 to the periphery of the closed end 18.

Relatively closed end 18 defines four mounting holes 20, venting slots 22, and a central opening 24 for receiving the rotor shaft. A bearing retaining rim 26 is formed on the inside surface of end 18, and apertures 28 are provided at end 18 to receive the through bolts which secure housing frame 12 to housing frame 14.

The wall members 19, 19' of each housing frame 12 and 14 terminate in a rim 30 which defines four rabbets 32, 34, 36 and 38. Two of the rabbets 34 and 38 are formed on the inner surface 40 of the walls 19, 19' to provide, respectively, first extending flanges 42 and 44 which are substantially contiguous with the outer surface 46 of the walls 19, 19'. The other two rabbets 32 and 36 are formed on the outer surface 46 of the walls 19, 19' to provide, respectively, second extending flanges 48 and 50 which are substantially contiguous with the inner surface 40 of the walls 19, 19'.

As shown most clearly in FIG. 2, the rabbets 32, 34, 36 and 38 are symmetrically arranged about the rim with respect to the central axis 54 of the opening defined by the rim. In this manner, the rim of frame 12 can be interengaged with the rim of frame 14 to form four rabbet joints, as indicated in FIG. 1.

In the illustrative embodiment, as seen most clearly in FIGS. 4 and 5, flanges 42 and 44 extend outwardly a greater distance than flanges 48 and 50. In this manner, the rabbet joints formed by the interengagement of frames 12 and 14 will always have a butt fit adjacent the outer surface 46 of the housing, as indicated most clearly in FIGS. 4 and 5.

Referring to FIG. 6, the sides 58 and 60 of flanges 44 and 48, respectively, lie in two planes which are separated from each other. Likewise, the sides of each other set of adjacent flanges lie in planes that are separated from each other, as shown in FIG. 2. In this manner, the units can be die cast more effectively.

A novel motor housing has been shown and described, which housing is relatively economical to manufacture and enables one to have a relatively balanced inventory, in that both ends of the motor housing are interchangeable with each other, yet they are also interengageable with each other. The housing of the present invention may take many shapes and forms, may be constructed in various ways, and may be used with both small and large electrical motors. Various other modifications and substitutions may be made without departing from the spirit and scope of the present invention.

I claim:

1. A motor housing comprised of a pair of identical rigid cup-shaped housing frames, each having a relatively closed end and a plurality of wall members extending from the periphery of said closed end, said wall members terminating in a generally continuous rim defining an open end, said rim having a plurality of rabbets formed by flanges having a thickness less than the thickness of said wall members, alternate ones of said flanges extending up from said rim along the inner surface of said wall members and forming a substantially continuous

smooth extension thereof to define rabbets formed along the outer surface of said wall members, the remaining flanges extending up from said rim along the outer surface of said wall members and forming a substantially continuous smooth extension thereof to define rabbets formed along the inner surface of said wall members; said housing being formed by the abutment of the rims of said pair of identical cup-shaped housing frames by which a plurality of rabbet joints are formed, said housing having a generally smooth continuous surface extending the length of its wall members between the opposed closed ends thereof.

2. A housing as claimed in claim 1 wherein a pair of opposed wall members are generally planar and another pair of opposed wall members are generally arcuate.

3. A housing as claimed in claim 1 wherein said remaining flanges have a length greater than said first alternating flanges to insure abutment of the rim of one frame with the remaining flanges of the other frame.

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