May 16, 1961 E. K. HANSEN ET AL 2,984,758

ELECTRIC MOTOR BRUSH HOLDER

Filed June 1, 1959

FIG. 1

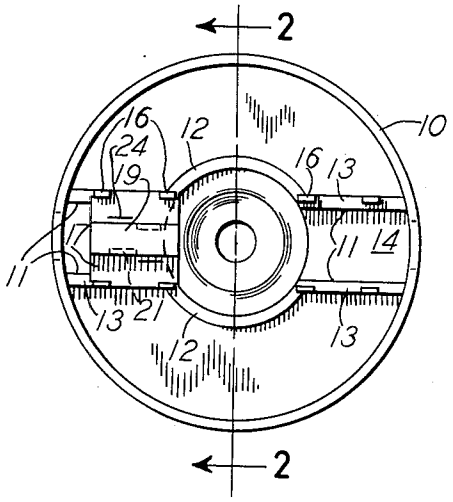
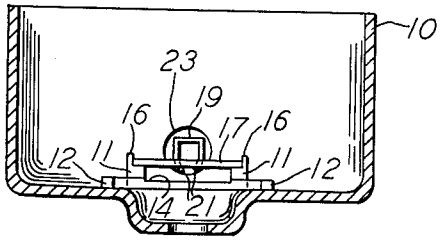


FIG. 2



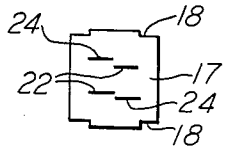


FIG. 3

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ELECTRIC MOTOR BRUSH HOLDER

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4 Claims. (Cl. 310—239)

This invention relates to an electric motor brush holder, and more particularly, it relates to a brush holder consisting of both the motor housing and the separate holder parts.

It is an object of this invention to provide a brush holder which in part is made integral with the motor housing by means of die casting said part directly with the housing. In achieving this object, there is eliminated the usual requirement of spot-welding or otherwise fastening the brush holder part which is connected to the housing, since the holder is now made integral with the housing.

Another object of this invention is to provide a brush holder which is more easily and accurately aligned with respect to the motor housing and thus the required alignment and contact of brush with commutator is better achieved. This particular object is accomplished by the die casting mentioned, and, because of die casting, the part of the holder attached to the housing is properly aligned with the housing, and further, the separable part of the holder is improved over the parts heretofore known, so that here also better alignment is achieved.

Still another object of this invention is to provide a brush holder which requires less labor in manufacture and assembly and thus is less expensive, and still the aforementioned objects are accomplished.

Still a further object is to provide a brush holder which is readily adaptable to variations in brush sizes while still providing a holder which is automatically and accurately aligned in the motor housing.

These and other objects and advantages will become apparent upon reading the following description in conjunction with the accompanying drawings wherein:

Fig. 1 is a top plan view of a motor housing with one brush holder in position thereon.

Fig. 2 is a sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a top plan view of the holder insulation piece shown in Figs. 1 and 2.

The same reference numerals refer to the same parts throughout the several views.

The drawings show a motor housing or end cap **10** which is of a cup shape and of course it will be understood that the remainder of the motor will suitably attach to the cap, and the motor parts will be disposed therein in the well-known manner. In this invention it is significant that the housing **10** is made of a die casting process so that a pair of shoulders or raised portions **11** is located on each diametrically opposite side of the housing **10** and is die cast with the housing **10** to be an integral part thereof. In this manner, the shoulders **11** are properly and accurately disposed within the housing **10** to be directed toward the center thereof and aligned with the central portion of the housing for a purpose hereinafter mentioned. Also as shown in the drawings, arcuate portions **12** are die cast in and with the housing **10** and shoulders **11** so that, as mentioned, the parts **10**, **11** and **12** are all made in one die cast unit to that the top or

upper surfaces **13** of the shoulders **11** are disposed above the surface **14** which is intermediate the shoulders **11**. Also, each shoulder **11** has prongs or clamps **16** which project above the surface **13** as clearly shown in Fig. 2.

Figs. 1 and 3, particularly, show the holder piece **17**, which can be made of the usual electrical insulation material, to be provided with four corner notches or recesses **18** which receive the prongs **16** as shown in the assembly views. Also of course, the lower surface of the piece **17** rests upon the shoulder upper surfaces **13** so that the piece **17** is securely and accurately disposed with respect to the die cast shoulders **11** and thus the piece **17** is automatically and properly aligned in the housing **10**. Of course a slight crimping or bending or swaging of the prongs **16** will secure the piece **17** to the housing **10** as desired. A brush metal casing **19** is attached to the insulation piece **17** by means of the casing tabs **21** passing through the slots **22** in the piece **17**. Here also the tabs or prongs **21** are crimped or bent inwardly to secure the rectangular casing **19** to the piece **17** in the usual manner. Particularly Fig. 2 shows that the holder casing **19** is aligned with the opening **23** in the housing **10**, and this opening **23** of course provides a mounting and access opening to the electrical brush (not shown) which would be disposed within the casing **19** in the usual manner. At this time it should also be noted, as shown in Fig. 3, that the piece **17** is provided with two other slots or slits **24** and these are spaced further apart than the spacing between the slits **22** and thus the slits **24** will accommodate a wider casing **19** so that the size of the brush holder in the assembly is readily and easily variable for different specifications required. Of course it will further be understood that the height of the casing **19** can be varied and in these variations, four different sizes of casings **19**, and therefore four different sizes of brushes can be employed because of the two sets of slits **22** and **24**, and with the piece **17** being readily able to accommodate these two sets of slits as the piece **17** is anchored through its corner notches **18** which do not interefere with the provision and location of the slits **22** and **24**.

Another important feature of this arrangement is that the tabs **21** of the casings **19**, which is normally a metal casing, are spaced from the end wall **14** in the motor housing **10** and thus there is no problem of shorting the motor through the brushes and the casings **19** and the housing **10**. This spacing is of course provided by the raised shoulders **11** so that, in addition to the shoulders **11** automatically aligning the insulation piece **17**, it can be said that the shoulders **11** provide the required spacing of the tabs **21** from the housing **10**. Also, a minimum of labor is required in the manufacture of the motor and particularly in the assembly of the brush holders in the position shown, as the raised portions or shoulders **11** are already in position in the die cast housing **10** and there need be only unskilled labor in inserting the insulation piece **17** with the casing **19** into the position shown and then slightly crimping or bending the prongs **16**, or otherwise upsetting them inwardly toward each other, to secure the piece **17** in position.

In this manner, a brush holder section consisting of the raised shoulder **11** with prongs **16** and including the insulation piece **17** with casing **19**, is provided for the objects and advantages mentioned at the outset. In the manner further mentioned, the holder section is an improvement over those heretofore known, including those which have pronged pieces spot welded to the motor housing and two prongs projecting thereon, and yet it has the cost and labor advantages mentioned.

While a specific form of this invention has been shown and described, it should be obvious that certain deviations therefrom could be effected, and the invention should,

therefore, be limited only by the scope of the appended claims.

What is claimed is:

1. A brush holder for an electric motor, comprising a cup-shaped motor housing including two access openings on diametrically opposite sides thereof for insertion and removal of an electrical brush with respect to the interior of said housing, a pair of shoulders integral with said housing on the end wall thereof and being disposed therein oriented with each one of said access openings and each including an upper surface spaced from said end wall of said housing, two prongs integral with and spaced apart on each of said surfaces and projecting thereabove, an insulation piece disposed on each pair of said surfaces and spanning each said pair of shoulders and having four notched corners respectively receiving said prongs for alignment and attachment of said piece with respect to said housing, and a brush casing attached to the upper surface of said piece by including prongs extended through said piece and into the space between said piece and said housing wall for aligning with said access openings.

2. A brush holder for an electric motor, comprising a die cast motor housing including an end wall, a pair of shoulders die cast integral with said housing and being disposed therein oriented with the central axis of said housing and each including an upper surface spaced from said end wall of said housing and disposed transverse to said axis, an insulation piece disposed on said surfaces and spanning said shoulders and having four notched corners, two prongs spaced apart on each of said surfaces and extending therefrom through respective ones of said notched corners and extending beyond said insulation piece in a free end for alignment and attachment of said piece with respect to said housing, and a brush casing attached to the upper surface of said piece by including prongs extended through said piece into the space between said piece and said housing wall.

3. A brush holder for an electric motor, comprising a motor housing, a projection section within said housing and including two spaced-apart surfaces defining a space with the wall of said housing, two spaced-apart prongs on each of said surfaces and extending therefrom in the direction away from said wall, an insulation piece disposed on said surfaces and spanning said space and having four recesses therein for receiving said prongs, said piece having four spaced-apart slots therein in the projected area of said space and with said slots being disposed to present two pairs of slots with the slots in each of said pairs being staggered across said piece with respect to the direction of the shortest distance between said surfaces, and a brush casing of a selected width attached to said piece by including two prongs of a selected spacing sufficient for extending through a selected one of said pairs of said slots and with the ends of the latter said prongs being disposed in said space away from said wall of said housing.

4. A die cast electric motor brush holder section comprising a one-piece housing including a recessed portion flanked by upstanding prongs cast to be integral with said housing and extending away from said recessed portion and terminating in free ends, an insulation piece having recesses for receiving said upstanding prongs and with said prongs extending beyond the thickness of said piece; for attaching said piece to said housing when said free ends are upset toward said piece, a brush casing including projections, said insulation piece having slots for receiving said projections in said recessed portion for securing said casing to said piece and with said projections being spaced from said housing.

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