July 2, 1963 R. J. BUSH 3,095,994

DYNAMOELECTRIC MACHINE CLOSURE MEANS

Filed June 23, 1960 2 Sheets-Sheet 1

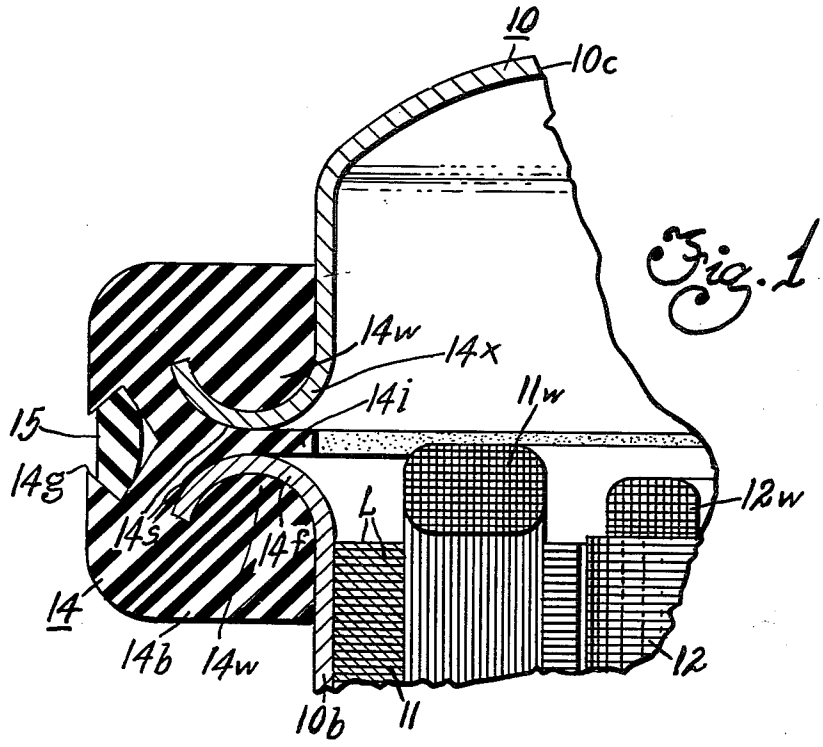


Fig. 1

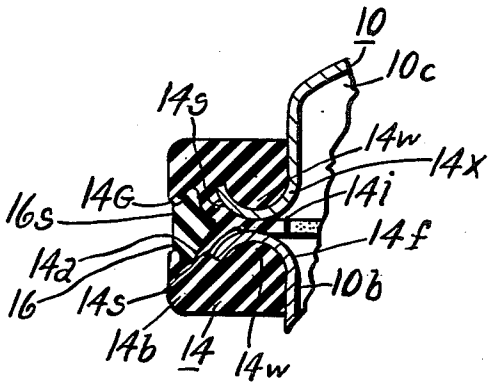


Fig. 2

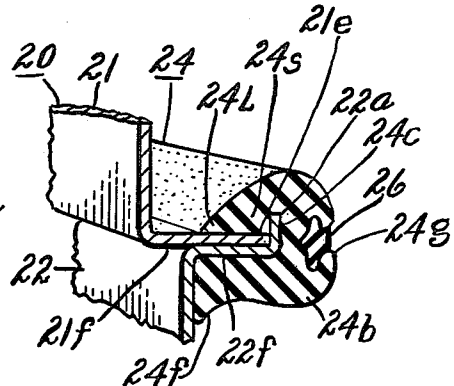


Fig. 3

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DYNAMOELECTRIC MACHINE CLOSURE MEANS

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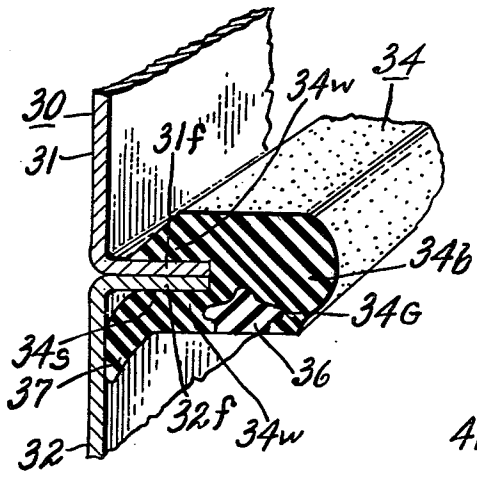


Fig. 4

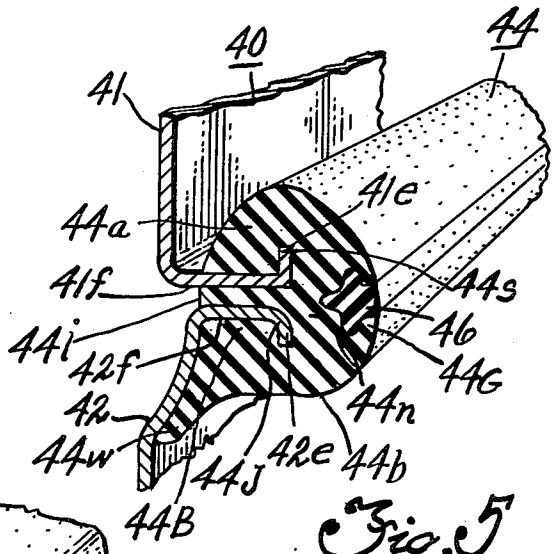


Fig. 5

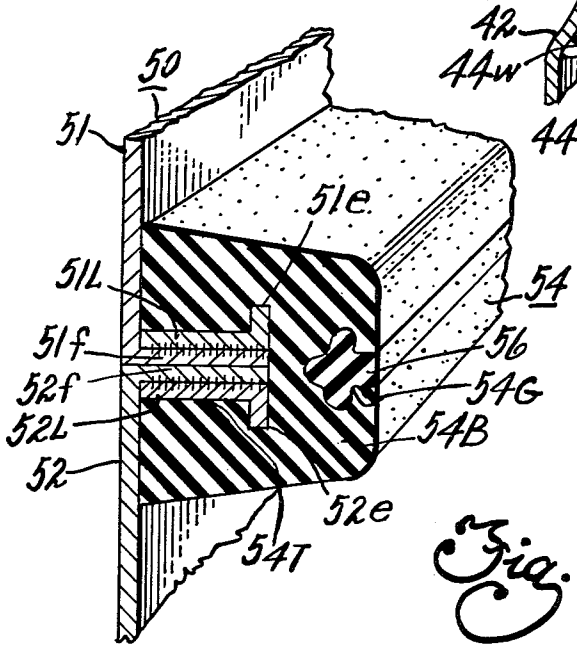


Fig. 6

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United States Patent Office 3,095,994 Patented July 2, 1963

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DYNAMOELECTRIC MACHINE CLOSURE MEANS

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Filed June 23, 1960, Ser. No. 38,180
2 Claims. (Cl. 220—46)

This invention relates to housings or casings for dynamoelectric machines such as motors, generators, transformers as well as for pumps and the like having at least two parts which are to be joined and fitted tightly adjacent to each other yet readily separable for servicing and access to internal components thereof.

An object of this invention is to provide a new and improved closure means economically and effectively to form junctures on housings or casings for electrical and mechanical equipment such as dynamoelectric machines as well as pumps and the like.

Another object of this invention is to provide a multipart transformer housing including substantially complementary flange means in combination with an elastomeric band-like body portion having predetermined slot means therein in which the flange means can be located and retained as a result of locking the band-like body portion with a filler strip or wedge-like insert complementary to a recess or groove extending longitudinally adjacent to said slot means in which the flange means are to be retained.

Another object of this invention is to provide a transformer and cover assembly including multiple parts each having flange means adapted to be in juxtaposed position to each other and held in sealed relation by closure means including a band-like body portion of elastomeric material having both an undercut groove and slot means extending longitudinally and adjacent to each other such that the slot means provide a seat for retention and positioning of the flange means.

A further object of this invention is to provide a hermetically sealed container, housing, casing and the like including separable parts having flange means joined to each thereof and joined by closure means having a continuous band-like body portion of elastomeric material grooved on one side where a separably insertable wedge portion can be forced into tight engagement so as to effect engagement of the flange means on opposite sides of an intermediate portion integral with the body portion and located intermediate a pair of slots into which the flange means are fitted, the intermediate portion serving both as a seal and to prevent rattle of the flange means relative to each other as they are maintained in aligned condition with each other.

Another object of this invention is to provide a closure means for a container, housing, casing and the like having two flange parts to fit together and to be retained in juxtaposition by a closure means body portion of elastomeric material including a laterally undercut groove in which a continuous wedge is mounted for spreading the body portion including at least one lip-seal portion into engagement with a peripheral surface of at least one of the parts while the flange parts are retained in locked together position.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiments of the invention are clearly shown.

In the drawings:

FIGURE 1 is a fragmentary cross-sectional elevational view of an assembly including parts joined by closure means in accordance with the present invention.

FIGURE 2 shows a modification of the assembly of FIGURE 1.

FIGURES 3 and 4 illustrate further embodiments of the present invention.

FIGURES 5 and 6 are cross-sectioned perspective views of additional features in accordance with the present invention.

The present invention is directed to the improvement of closure effected for multi-part housing, containers, or casings such as generally indicated by numeral **10** in FIG. 1 of the drawings. The housing **10** includes an annular body portion **10***b* as well as a cover **10***c* adapted to fit adjacent to each other. Such a housing or casing can be provided for dynamo-electric machines as well as for pumps having components such as stators, rotors, metal cores carrying primary and secondary windings and the like as well as other devices. Some transformers have tank or housing structures previously joined by rivets, nuts and bolts, spot welding and the like. On motors and generators the cover **10***c* can be called an end frame and for each of the installations it is sometimes necessary to have a cover removable to permit access for an inspection of internal components of the device. Quite often protection against moisture and foreign materials such as dust and dirt is required for the components in the housing and mechanical fastening means such as the screws or rivets and even welds can become loosened so as to permit rattling of the housing parts relative to each other and to permit entry of foreign matter such as the moisture, dirt and the like. To illustrate environment of the closure means used in accordance with the present invention FIG. 1 includes a stator or primary means **11** and a rotor or secondary means **12** suitably supported or journalled for movement or rotation relative to the stator in a well known manner. The stator can have a plurality of slots provided therein as formed by a plurality of sheet metal laminations stacked in axial alignment relative to each other and carrying the coil or winding means **11***w*. The stator thus has a core of magnetic material formed by plural laminations L having an outer periphery press-fitted or otherwise suitably joined or secured to an inner peripheral surface of the body portion **10***b* of the housing or casing **10**. The rotor **12** can also be formed of sheet metal laminations to provide a magnetic core for conductors fitted into slots or a cast squirrel cage winding such as **12***w*. The housing or casing having closure means in accordance with the present invention can be used for transformers including relatively rotatable stator and rotor portions or having only a magnetic core fitted with primary and secondary windings. In many installations, a hermetic seal is necessary for components of a device and closure means generally indicated by numeral **14** provides both protection against entry of foreign material as well as resilient fit for sound proofing to avoid noisiness and rattling of cover portion **10***c* relative to body portion **10***b*.

The closure means **14** includes a body portion of elastomeric material indicated by numeral **14***b* having an integral intermediate portion **14***i* projecting laterally in between a pair of arcuate cutouts or slot means **14***s*. The body portion **14***b* of elastomeric material can be extruded as a continuous longitudinally extending strip having a recess or undercut groove **14***g* with a substantially diamond-shaped cross-sectional configuration into which a filler strip or wedge means **15** can be inserted to maintain a pair of arcuate wing portions **14***w* in locking engagement with a concave peripheral surface of flange means provided on the body portion and cover portion of the housing or casing **10**. The body portion **10***b* includes an arcuate semicircular flange end **14***f* adapted

to fit in one of the slots 14*s* and the cover portion 10*c* includes a similar flange 14*x*. The wedge 15 urges the flange ends 14*f* and 14*x* into tight sealing engagement with the intermediate portion 14*i* which serves both to seal these flange ends in juxta-position relative to each other and to separate these flange ends a predetermined distance from each other so as to prevent and avoid any possibility of noise transmission or rattling between the cover portion 10*c* and the body portion 10*b*. Removal of the wedge or filler strip 15 permits flexing of the semicircular wing portions 14*w* away from each other on opposite sides of the intermediate portion 14*i* such that flange ends 14*f* and 14*x* complementary to each other can be removed from the pair of slots 14*s* for disassembly of the cover portion 10*c* from the body portion 10*b*.

The assembly illustrated in FIG. 2 is similar to that shown by FIG. 1 and identical reference numerals are applied to identify structure common to the two views. However, the undercut groove or recess identified by numeral 14G in FIG. 2 differs from that shown in FIG. 1 so far as the configuration thereof is concerned and there are arcuate convex surfaces 14*a* positively engageable by a complementary filler strip or wedge 16 having an outer surface 16*s* adapted to be flush with an outer peripheral surface of the body portion 14*b* of the closure means 14. In both FIGS. 1 and 2 it is apparent that the intermediate portion 14*i* is integral with the body portion 14*b* so as to form a substantially Y-shaped configuration therewith as a result of the presence of the slots 14*s*.

In FIG. 3 there is a modified housing or casing generally indicated by numeral 20 including a pair of parts 21 and 22 each having a laterally outwardly extending flange portion such as indicated by numerals 21*f* and 22*f* respectively. The flange portion 22*f* of the one part 22 forms a bridge between this part and a short axially extending portion 22*a* adapted to telescope over an outer edge 21*e* of the flange portion 21*f*. The flange portions 21*f* and 22*f* are maintained in juxtaposition to each other also by closure means generally indicated by numeral 24 having a body portion 24*b* provided with a groove 24G undercut along opposite sides thereof and adapted to be fitted with a filler strip or locking wedge 26 which assures maintenance of the flanges 21*f* and 22*f* in face to face relationship with each other. One side of the closure means 24 is provided with a sealing lip portion 24L integral with a shoulder portion 24*s* adapted to abut against the axial extension 22*a* and end 21*e* for holding the part 21 in locked engagement with part 22. Additional sealing is provided by a fillet 24*f* integral with the body portion 24*b* and snugly engageable against an outer peripheral surface of the part 22. The semicircular flanges 14*f* and 14*x* and also the axial portion 22*a* are adapted to hinder lateral displacement of the closure means 14 and 24 respectively from maintenance of adjacent flanges either in sealing engagement with intermediate portion 14*i* or face to face relation to each other. The flanges 21*f* and 22*f* fit into a common slot or cutout 24*c* as shown in FIGURE 3. The container or housing structure illustrated in FIGURES 1–3 can be angular or cylindrical though closure means in accordance with the present invention for use on dynamoelectric machine housings, pump casings and the like can also be fitted to hold parts in juxtaposition to each other on square or rectangular shape containers.

FIGURE 4 illustrates such a rectangular container or boxlike structure generally indicated by numeral 30 having a wall or body portion thereof 31 with an integral flange 31*f* adapted to fit flush against a flange 32*f* of a secondary part or cover 32. Closure means generally indicated by numeral 34, can be provided to have a pair of wings 34*w* separated by a slot 34*s*. The flanges 31*f* and 32*f* extending directly laterally outwardly from the parts 31 and 32 are held frictionally in engagement with each other by these wing portions 34*w* due to wedging engagement of the filler strip 36 in a groove or undercut recess 34G in a body portion 34*b* of the closure means 34. The slot 34*s* and groove 34G are located at right angles to each other. A sealing lip extension 37 is provided integral with one of the wing portions 34*w*, preferably the one on the same side as the wedge or filler strip 36 inserted in the groove 34G.

FIGURES 5 and 6 show in perspective, fragments of containers or housing means including separable parts maintained in assembled relationship to each other by closure means also in accordance with the present invention. The combination of these closure means with two-part dynamoelectric machine housing structure effects hermetic sealing of components such as for a refrigerator compressor motor. The housing or container, generally indicated by numeral 40 in FIGURE 5, includes a first part 41 having a hook-like flange 41*f* that terminates in an end 41*e* adapted to fit into engagement with a slot in closure means generally indicated by numeral 44. This slot 44*s* has an L-shape such that the end 41*e* fits therein a direction extending opposite to the direction of an arcuate end 42*e* of a flange 42*f* of a secondary part or cover 42 of the housing 40. The flange 42*f* and end 42*e* fit into a J-shaped slot 44J which is spaced a predetermined distance away from the slot 44*s* by an intermediate portion 44*i* which is in effect the base of a T-shaped configuration formed by neck portion 44*n* integral with both a body portion 44*b* of the closure means and the intermediate portion 44*i*. A sealing wiper or web portion 44*w* is also integral with the body portion 44*b* and a wedge or filler strip 46 is insertable in a groove or undercut recess 44G extending longitudinally along one side of the body portion 44*b* of elastomeric material. An anchor end 44*a* integral with the body portion 44*b* is adapted to lock in engagement behind the edge 41*e* against the flange 41*f* such that the intermediate portion 44*i* is in sealing engagement and insulating position between flanges 41*f* and 42*f*. A locking bead portion 44B integral with the body portion 44*b* has a configuration substantially complementary to the concave surface on one side of the flange 42*f*.

In FIGURE 6 there is shown a container generally indicated by numeral 50 having a first part 51 including a laterally outwardly extending flange 51*f* on which an L-shaped member 51L has been bonded such as by welding, soldering and the like. A second part or cover member 52 has a flange 52*f* to which an L-shaped member 52L is secured such that ends 51*e* and 52*e* are located substantially co-planar with respect to each other though extending in opposite directions and adapted to fit in locking engagement with a T-shaped slot 54T. This T-shaped slot 54T is formed as the elastomeric material for closure means generally indicated by numeral 54 is extruded to have a body portion 54B further including an undercut recess or groove 54G. A wedge-like insert 56 fits into locking engagement with the opposite sides of the undercut groove or recess 54G so as to retain the ends 51*e* and 52*e* carried by the flanges 51*f* and 52*f* in locking engagement with respect to the T-shaped slot 54T.

While the embodiments of the present invention as herein disclosed constitute preferred forms it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. On a dynamoelectric machine having primary and secondary internal components contained within stationary housing parts each having outwardly projecting flanges which adjoin each other, the improvement therewith which comprises an external elongated completely non-metallic combination seal and closure means of elastomeric material having a body with an undercut recess on one side as well as laterally adjacent preformed slot means on an opposite side thereof to complement said flanges free of any bonding thereto as installed to fit

snugly though removably therefrom, and a replaceable filler strip wedged longitudinally into said undercut recess of said body in a location spaced away from said flanges so as to maintain snug seal-like locking engagement of said elastomeric body externally around said flanges of said stationary housing parts inside of which said primary and secondary internal components are protected and free for movement relative to each other though such movement is independent of said elastomeric body.

2. In a multi-purpose assembly for maintenance of interlock fastening, hermetic seal as well as sound-deadening rattle elimination on a stationary container, housing, casing and the like for a dynamoelectric machine transformer, pump and the like having primary and secondary components carried within a pair of housing parts each having laterally-projecting substantially-complementary flanges integral therewith, an improvement comprising an elongated completely non-metallic seal-closure means of elastomeric material having a body with a pair of laterally adjacent though divergently terminating preformed slot means on one side thereof exclusively engageable with said laterally-projecting substantially-complementary flanges and with an undercut recess on an opposite side thereof, an intermediate portion extending away from the undercut recess and completely integral with said body in a location in between said slot means as a

seal and rattle eliminator between said flanges, and a replaceable completely non-metallic filler strip also of elastomeric material tightly wedged into the undercut recess in a location spaced away from said flanges so as to maintain proper snug seal-like locking engagement of said elastomeric body externally around said flanges of said stationary housing parts inside of which said primary and secondary internal components are protected and free for independent movement relative to each other though said sound-deadening rattle-eliminating intermediate portion as well as said body in snug seal-like fastening engagement with said flanges keep foreign material such as dust, dirt, moisture and the like from entering the assembly.

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