July 20, 1954

R. L. REDMOND

2,684,400

INSULATING GROMMET

Filed March 31, 1950

FIG. 1

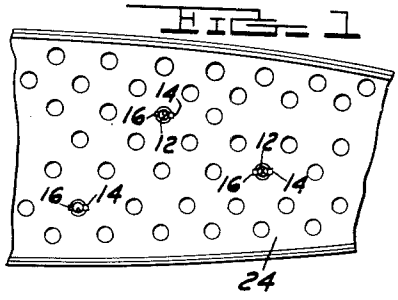


FIG. 2

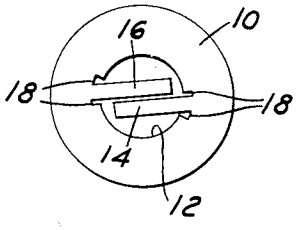


FIG. 3

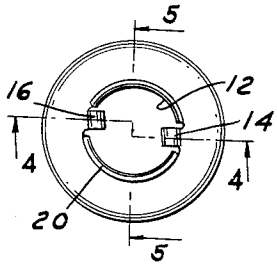


FIG. 4

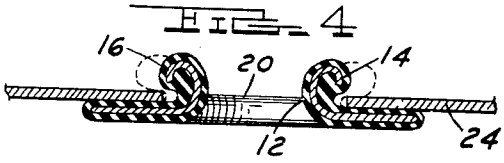


FIG. 5

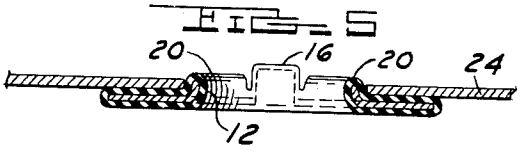


FIG. 6

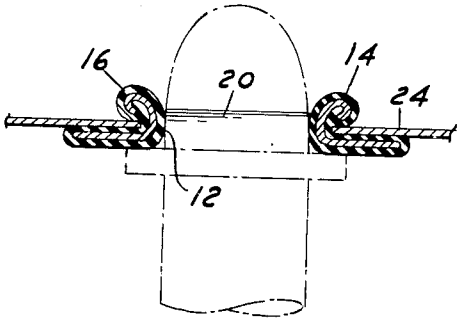
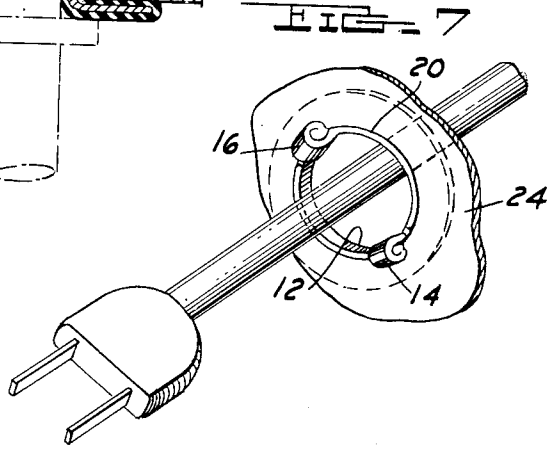


FIG. 7



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INSULATING GROMMET

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Application March 31, 1950, Serial No. 153,138

3 Claims. (Cl. 174—153)

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This invention relates to an improved insulating grommet.

Attention is directed to Patent 2,234,441, issued March 11, 1941, to Gerald C. Ludwig, wherein there is shown an insulating grommet having a drawn neck portion adjacent the inside margin and retaining projections extending from the drawn portion arranged to be bent over to hold the grommet in place.

It is an object of the present invention to provide a rubber coated grommet which is an improvement over the patented device above referred to in that the retaining tangs or prongs serve initially to hold the unit in place and are also adapted to be finally positioned after the initial installation to lock the grommet in position.

Briefly, the invention consists of a grommet formed from a single piece of metal in which the retaining fingers are struck from the central portion of the blank at the same time that a hole is formed centrally. A locating neck portion is formed at the inner margin of the grommet, and the locating fingers are curled outwardly to provide opposed loops at the inner periphery of the grommet. These loops serve initially to position the grommet in place and finally to hold the unit in the installed position after a deformation operation.

Other objects and features of the invention relating to details of construction and operation will be apparent in the following description and claims.

Drawings accompany the specification, and the various views thereof may be briefly described as:

Figure 1, a section of an airplane wing showing the reinforcing web member with grommets in position.

Figure 2, a showing of the blank of the grommet.

Figure 3, a showing of the grommet as it is formed prior to the rubber coating.

Figure 4, a sectional view of the grommet after it is coated, taken on line 4—4 of Figure 3.

Figure 5, a sectional view showing the grommet in installed position, the section of the grommet being taken on line 5—5 of Figure 3.

Figure 6, a view showing the manner in which a deforming tool passes through the grommet to bend the retaining tabs to final position.

Figure 7, a view of the grommet in position illustrating the relationship to a conduit passing through the grommet.

In airplane construction and the construction of other vehicles, it is quite common to pass electric wires or small tubes from one portion of

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the vehicle to another through the various structural members. Figure 1 is illustrative of an airplane wing section showing the manner in which grommets may be positioned in a perforated plate to serve as guiding and insulating means for conduits or tubes passing through.

The particular grommet under consideration is shown in blank form in Figure 2. It is fashioned of a flat sheet of metal, and the blank consists of an annular portion 10 provided with an aperture 12 centrally thereof, also circular. Two retaining tabs or prongs are formed during the stamping operation and extend inwardly into the opening 12 at 14 and 16. The margin of the opening 12 is notched at 18 a slight distance inwardly on either side of the tabs 14 and 16 as shown best in Figure 2. Various forming operations are applied to the blank, after which it appears as shown in Figure 3 with the margins of the opening 12 being turned up to form a circular collar 20 centrally of the unit. The distal ends of tabs 14 and 16 are curled outward and back toward the base or proximal end of each tab to form loops which overlie the margins of the aperture and part of the annular portion 10.

After the forming operation the unit is dipped or otherwise treated to apply a layer of rubber over the entire surface. The unit then appears as shown in section in Figures 4 and 5. The unit is then ready to be applied to an apertured plate as shown in the drawings, and the partially formed curled tabs will serve to hold the grommet in place as applied by reason of the slight resilience of the rubber and the metal as it is pushed through the aperture.

It is then possible to deform the tabs as shown in Figure 6 by the projection of a rounded tool through the opening to bend the tabs over the margin of the aperture in the plate 24 to which the grommet is being fastened. The tabs are then permanently distorted so that the grommet is finally in position, as shown in Figure 7. Instead of a tool as shown in Figure 6, a pair of forming pliers can be used to shape the tabs to final position as suggested, for example, by Patent 2,227,290 to Wiley, issued December 31, 1940.

If desired, the curled tabs 14 and 16 may be formed of spring metal to permit a resilient retention in an aperture suitably dimensioned to receive them while moved toward each other and to retain them by the inherent resilience of the tabs.

It will thus be seen that I have provided a rubber coated grommet which may be applied

rapidly by an unskilled workman to an apertured plate both in the initial application where it is self-retaining and in the final application where it is finally secured in place. In addition, the grommet is much better adapted to shipment without damage in large quantities since the curled tabs are not subject to easy crushing or distortion by reason of the weight of the massed grommets.

What I claim is:

1. An insulating grommet comprising a metal insert having a flat portion with an aperture therethrough, portions of the margin of the aperture being drawn axially with respect thereto, prongs formed integrally with the insert based on the flat portion of the insert at the margin of the aperture and independent of the drawn portions of the margin of the aperture, said prongs extending to one side of the insert and being curled upon themselves, and a rubber body covering said insert and prongs and having an angular portion covering the drawn margin of the aperture, said axially drawn portions and said prongs extending in the same axial direction from said flat portion.

2. An insulating grommet of the type to be temporarily and subsequently permanently installed in a hole in a retaining panel comprising a flat metal body having an aperture therethrough, portions of the margin of the aperture being drawn axially with respect to the body to be received in a retaining aperture, prongs formed integrally with the body independently of the drawn margin of the aperture and extending away from the body in the direction of the axial margin, said prongs extending to one side of the body and based at the edge of the aperture on the flat portion of the body and independent of the drawn margin of the aperture and being curled upon themselves in a direction away from said aperture back toward and overlying said body to provide a looped portion, and a rubber body covering said insert and prongs and having an angular portion covering the drawn margin of the aperture, said covered prongs being shaped to provide a resilient reentrant portion on the outsides thereof to co-operate temporarily with the margins of a retaining aperture, said prongs being bendable outwardly to a final locking position on the opposite side of a retaining plate from the body of the grommet.

3. In combination with a grommet as defined in claim 2, an apertured plate having apertures dimensioned to receive the axial drawn margin of the body in a relatively snug fit, said apertures co-operating to lock the prongs of the body temporarily in place on one side of the plate while the body lies on the other side of the plate.

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