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3,366,918

SHELL-TO-SHELL-TO-SHELF RFI SEAL SPRING

Filed Nov. 23, 1966

2 Sheets-Sheet 1

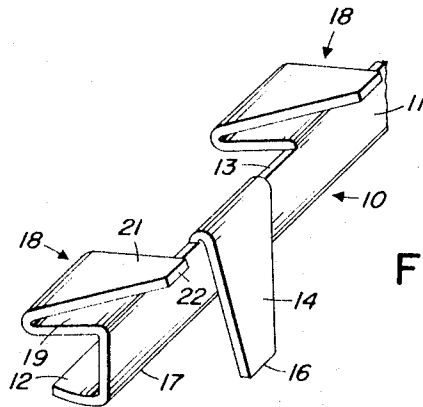


FIG 1

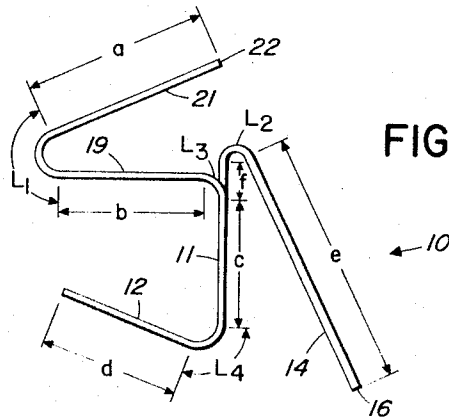


FIG 2

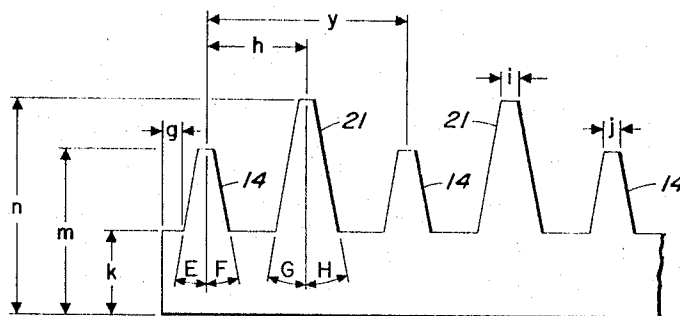


FIG 3

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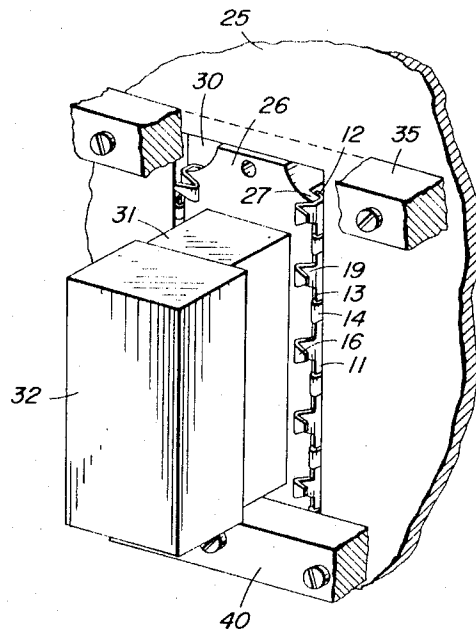


FIG 4

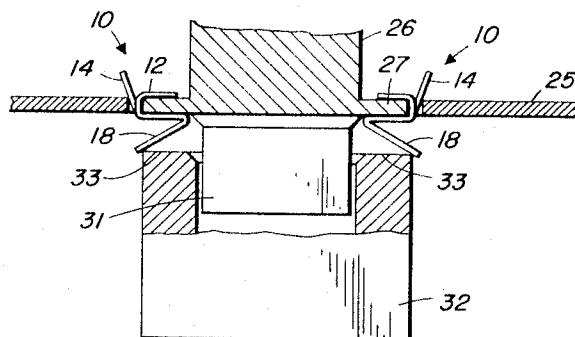


FIG 5

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3,366,918

SHELL-TO-SHELL RFI SEAL SPRING
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7 Claims. (Cl. 339-143)

ABSTRACT OF THE DISCLOSURE

This invention consists of an electrical seal that can be mounted between a pair of members so as to also engage a mounting plate and provide electrical contact between the three members, thus providing electrical continuity and shielding from radio frequency energy.

This invention relates in general to a frequency interference seal spring and, in particular, to a flexible strip that can be mounted so as to provide a radio frequency shield between a first member and two other members.

In electrical equipments it is often desirable to mount an electrical member such as a component so that it makes electrical contact with two other members. For example, a component which has a male and female shell might be mounted in an opening in a shelf.

It is an object of the present invention, therefore, to provide a radio frequency interference seal capable of electrically connecting a male and female connector shell with a shelf so that they have electrical continuity and radio frequency interference does not occur.

Another object of this invention is to provide a radio frequency seal between a first member and two other members which may be occasionally disengaged.

A feature of this invention is found in the provision for a spring seal member with complex projections bent along its edges so as to provide a radio frequency shield.

Further objects, features, and advantages of this invention will become apparent from the following description and claims when read in view of the accompanying drawings, in which:

FIGURE 1 is a perspective view of the radio frequency interference shield of this invention;

FIGURE 2 is an end view of the shield of this invention;

FIGURE 3 is a plan view of a blank from which the shield is formed and is illustrated prior to bending;

FIGURE 4 is a perspective view of the radio frequency interference shield of this invention in place while making electrical contact between a pair of shell members and a shelf; and,

FIGURE 5 is a sectional view illustrating the seal.

FIGURE 1 illustrates the seal strip designated generally as 10. It comprises a longitudinal body portion 11 which is formed with a first portion 12 at right angles to the body portion 11. The other edge 13 of the body portion 11 is formed with a first plurality of offset tabs 14 which extend backwardly along the body portion 11, but whose ends 16 terminate beyond the edge 17 of the body portion 11.

A second plurality of tabs 18 extend from the edge 13 between the tabs 14 and comprise first portions 19 which extend parallel to the sides 12 and which have second portions 21 which form an acute angle with the portions 19 and extend backwardly toward the body portion 11. The ends 22 of the portion 21 extend beyond the base 11.

The ends 16 and 22 of tabs 14 and 21 are truncated as shown.

FIGURE 2 is an end view of the interference shield of this invention and FIGURE 3 is a plan view of a

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blank of electrical conducting spring material from which the seal is formed.

A particular shield according to this invention was constructed with the following dimensions: (see FIGURE 2)

Material beryllium copper, annealed 0.003 inch thick.

a—0.068 inch

b—0.53 inch

c—0.044 inch

d—0.061 inch

e—0.089 inch

f—0.008 inch

L₁—0.00327 inch—160 degrees

L₂—0.0084 inch—145 degrees

L₃—0.00267 inch—90 degrees

L₄—0.003 inch—105 degrees

The dimensions of a blank according to FIGURE 3 were as follows:

g—0.020 inch

h—0.125 inch

i—0.020 inch

j—0.020 inch

k—0.110 inch

m—0.214 inch

n—0.266 inch

y—0.250 inch

∠E, ∠F, ∠G, ∠H—10 degrees

The blank of FIGURE 3 is formed into the structure of FIGURE 1 and 2 by bending dies in a well known manner.

In use, the shield 10 is placed on either side of a male connector socket 26 which has ledges 27 formed on its edges. The radio frequency interference seal spring 10 is inserted onto the ledge 27 such that sides 12 and 19 engage opposite sides of the ledge and the back 11 engages the edge of the ledge. The male socket 26 is mounted in a plate 25 formed with an opening 30. Bars 35 and 40 are attached to plate 25 and the male socket 26 by suitable nuts and bolts as shown.

The tabs 14 extend outwardly from the ledge 27 when the male socket 26 is out of engagement with the plate 25, but when the socket 26 is in position in plate 25, the tabs 14 engage the edges 23 of plate 25 and provide an interference shield. The male socket 26 has a projection 31 upon which a female socket 32 is received. When the female socket 32 is moved into engagement with the male socket 26, the flexible tabs 18 make electrical engagement with the ends 33 of the female socket 32 as shown in FIGURE 5. In the assembled position the seal of this invention electrically connects the plate 25, the male socket 26 and the female socket 32. It is to be realized that although sockets 26 and 32 have been described which may comprise electrical plugs, that any type of members may be connected with the shield of this invention.

It is seen that this invention provides a radio frequency interference seal spring capable of electrically connecting a male and female connector and a plate. The flange 27 may be 0.04" thick. The spring, once in place on the flange 27, remains as an integral part of the male connector 26.

It is seen that this invention provides a radio frequency interference seal spring and although it has been described with respect to a particular embodiment thereof, it is not to be so limited, as changes and modifications may be made therein which are within the spirit and scope of the invention as defined by the appended claims.

We claim:

1. An interference shield for preventing radiation from

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a male and female socket mounted in an opening in a plate, with a ledge formed about the edge of the male socket in alignment with the plate within the opening, the shield formed having a generally U-shaped portion which is shaped to press-fit over the ledge, a first plurality of tabs extending from the shield and engageable with an edge of the opening of the plate to make electrical contact therewith, and a second plurality of tabs extending from the shield and shaped to make electrical contact with the female socket.

2. In apparatus according to claim 1 wherein the first tabs extend backwardly and outwardly from the one edge of the U-shaped portion of the shield.

3. In apparatus according to claim 1 wherein the second tabs form the one edge of the U-shaped portion of the shield.

4. In apparatus according to claim 1 wherein the first and second plurality of tabs extend from the same edge of the U-shaped portion and wherein the first plurality

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of tabs makes an angle of about ninety degrees with the second plurality of tabs.

5. In apparatus according to claim 4 wherein the first and second plurality of tabs are alternately spaced along the edge of the U-shaped portion.

6. In apparatus according to claim 4 wherein the seal is made of electrically conducting flexible material.

7. In apparatus according to claim 6 wherein the material is beryllium copper.

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References Cited

UNITED STATES PATENTS

2,062,256	11/1936	Del Camp	-----	339—143	UX
2,762,990	9/1956	Kielenstyn	-----	339—143	
2,844,644	7/1958	Soule	-----	174—35	
2,872,139	2/1959	Bedford	-----	339—128	UX

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