

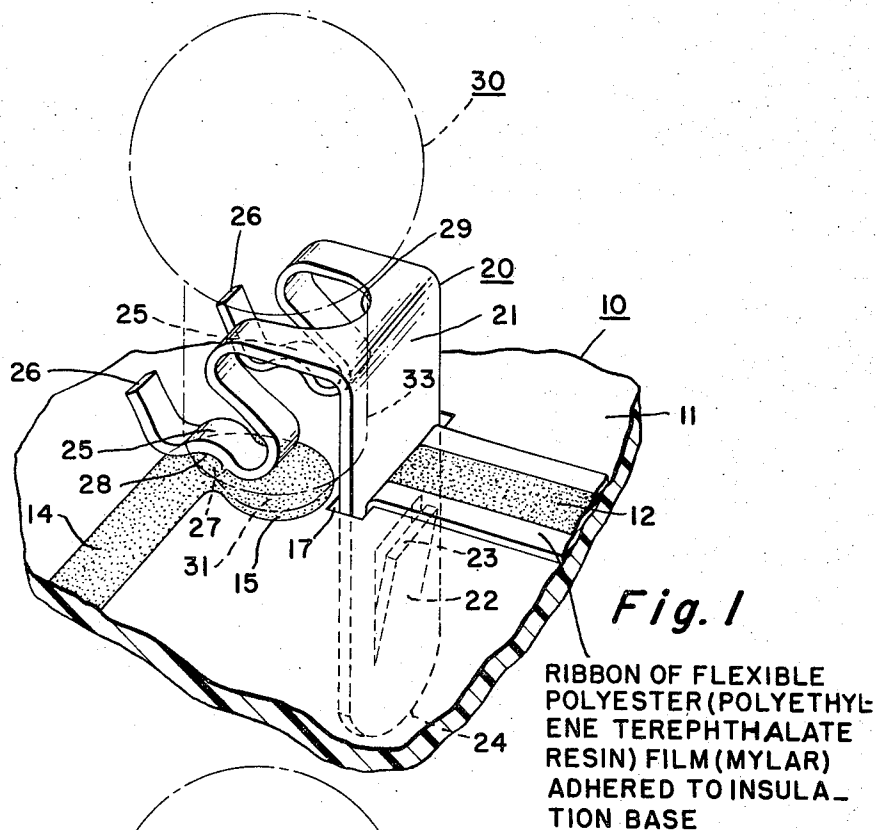
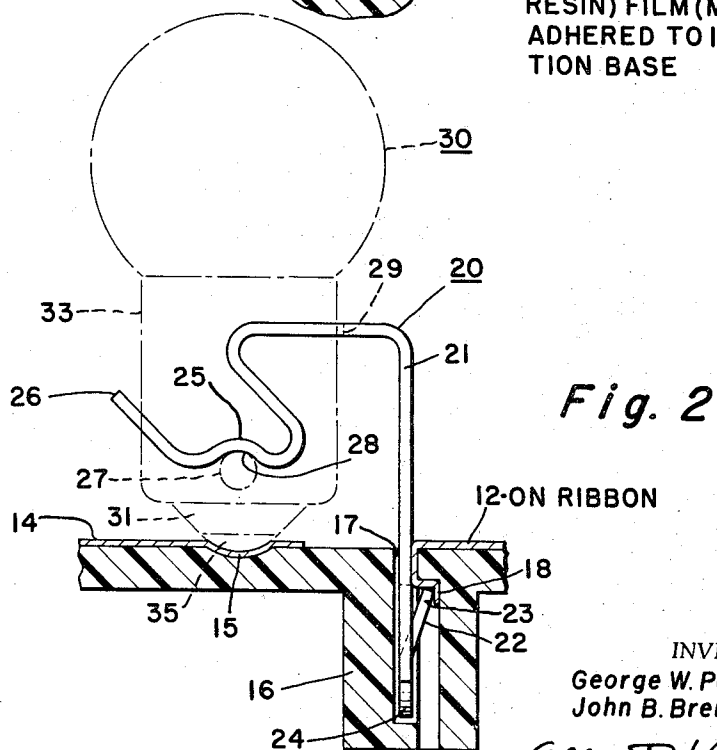
Sept. 26, 1967

G. W. PARKER ET AL
MULTI-FUNCTION CLIP MEANS

3,344,388

Filed Aug. 27, 1965

2 Sheets-Sheet 1



INVENTORS
George W. Parker
John B. Brennan, Jr.

Albert H. Reuther
Their Attorney

Sept. 26, 1967

G. W. PARKER ET AL

3,344,388

MULTI-FUNCTION CLIP MEANS

Filed Aug. 27, 1965

2 Sheets-Sheet 2

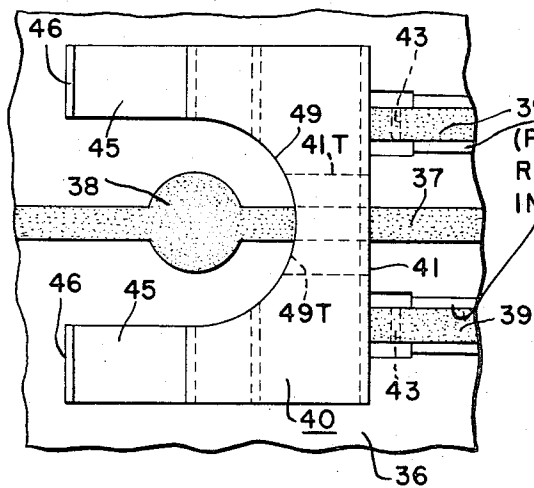


Fig. 3

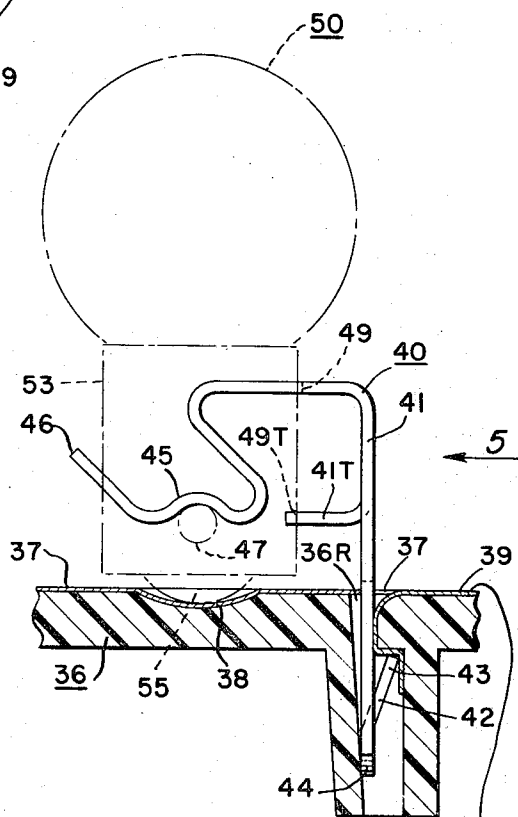


Fig. 4

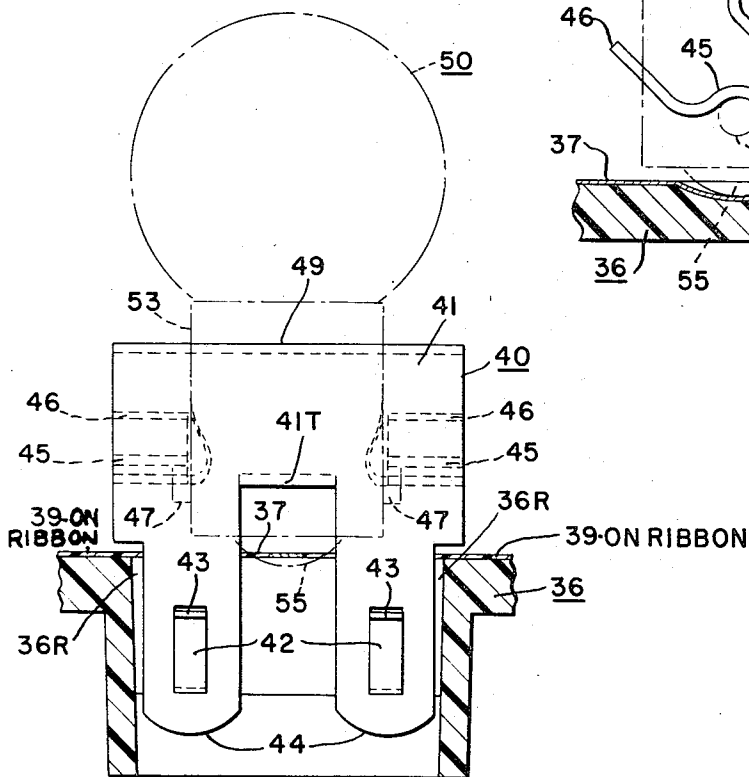


Fig. 5

CONDUCTOR
39-ON
MYLAR
RIBBON

INVENTORS

George W. Parker
John B. Brennan, Jr.

Albert H. Reuther
Their Attorney

1

3,344,388

MULTI-FUNCTION CLIP MEANS

George W. Parker, Clio, and John B. Brennan, Jr., Flint, Mich., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed Aug. 27, 1965, Ser. No. 483,071

9 Claims. (Cl. 339-17)

This invention relates to bayonet lamp bulb mounting, and more particularly, to electrical energization thereof directly as to printed circuitry.

Complexity of lamp mounting adds to problems of limited access space in vehicle crash pad or dashboard instrument panel installations. An object of the present invention is to provide a multi-function clip means which permits a straddle fit of bayonet lamp bulb means thereto directly as to printed circuitry used for instrument panel purposes.

Another object of this invention is to provide socket mounting support for bayonet lamp bulb means with a minimum of structure. There is full stabilization due to lateral tab portions of clip means secured directly to printed circuitry. Combined clip means and printed circuitry axially engaged by the bulb eliminate turning and/or twisting during installation. Thus features of this installation are adapted for manual as well as automated machine installation of bulbs. Reductions in cost of installation and material become feasible.

A further object of this invention is to provide a unitary multi-function clip means for use in combination with printed circuitry and bayonet lamp bulb means. The clip means includes a substantially L-shaped body portion having a tab with a free end that interlocks with a printed circuit recess-forming portion. A bifurcated and arcuately recessed end of clip means in a location remote from the tab has wavy W-shaped configuration which complements bayonet lamp bulb projections. A printed circuit depression or recess complements axial fit of the bayonet bulb means directly between printed circuitry and the W-shaped configuration of clip means.

Another object of this invention is to provide printed circuitry having a common connector portion centrally thereon and recessed for axial engagement directly by an end or tip of bayonet lamp bulb means. Lateral projections of the bayonet lamp bulb means are engaged by a substantially W-shaped pair of endings of clip means bifurcated in opposite directions or locations to straddle lamp bulb means and the common connector portion or conductor. Intermediate tabs having free ends on opposite sides of a metal body portion of the clip means fit a mounting recess of printed circuitry means and laterally stabilize positioning of the bulb means.

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 present invention are clearly shown.

In the drawings:

FIGURE 1 is a fragmentary perspective view of structure in accordance with the present invention.

FIGURE 2 is a partially sectioned elevational view of structure in FIGURE 1.

FIGURE 3 is a plan view of further structure having features in accordance with the present invention.

FIGURE 4 is a partially sectioned elevational view of structure in FIGURE 3.

FIGURE 5 is a partially sectioned end view taken in direction of arrow 5 in FIGURE 4.

2

When printed circuits were first applied and used for automobile or vehicle instrument panels, bayonet base lamp bulb means were most commonly available for such installations. Printed circuit assemblies or subassemblies using three piece socket structures were provided in accordance with Patent 2,825,038, Woofter, issued Feb. 25, 1958, to the assignee of the present invention. This patent discloses mechanical and electrical connection of bayonet lamp bulb means to a cluster of circuitry. Such assemblies were readily accessible and were easily removable from under an instrument panel or vehicle crashboard panel for lamp replacement. Subsequently, so-called wedge-base lamp bulb means became available for use with similar three piece socket structure disclosed by Patent 3,017,599, Loesch, issued Jan. 16, 1962, to the assignee of the present invention.

Space between vehicle fire wall or paneling and instrument housings or dashboard mountings is being drastically reduced. This trend results in problems of limited access space. Thus removal of sockets in accordance with the foregoing patent disclosures will be increasingly difficult from beneath a mounting location. At present, cost of wedge-base lamp bulb means is still greater than that of bayonet lamp bulb means. Trends are toward dashboard subassembly including front removable instruments and reference is made to Patent 3,175,576, Woofter et al. issued Mar. 23, 1965, to the assignee of the present invention. Ultimately, further reduction in amount of material and cost is necessary.

FIGURE 1 shows a printed circuit means generally indicated by numeral 10 having an insulating base 11 as well as a conductive ribbon or printed circuit portion 12 and additional printed circuit conductor means 14. A depression or printed circuitry recessing 15 is provided complementary to the insulating board 11 at a predetermined location to one side of recess forming means 16 integral with the insulating material 11. A slot or opening 17 is located substantially transversely to a terminating end 18 of the printed circuit portion 12. This ending of printed circuit portion 12 is engaged by multi-function clip means generally indicated by numeral 20 and having features in accordance with the present invention.

The multi-function clip means 20 shown in FIGURES 1 and 2 includes a unitary body portion 21 of suitable metal having a tang or tab 22 bent angularly to one side thereof. A free end 23 of the tab or tang engages the ending 18 of the printed circuit portion 12. A rounded end 24 of the body portion 21 fits complementarily to the recess forming portion 16 of the insulating material 11 for stabilization of the clip means 20. The body portion 21 has a substantially L-shaped configuration including a wavy W-shaped portion 25 which terminates in a guide end 26. The guide end 26 is engaged initially by a bayonet projection or lug 27 which fits complementarily to a central recessing 28 of the wavy W-shaped contact portion. It is to be understood that a pair of such wavy W-shaped structures are integral with the clip means 20 and an arcuate recessing or cutout 29 of the clip means between this pair of W-shaped portions also complements bulb means generally indicated by numeral 30.

The bulb means 30 further includes an insulating portion 31 adjacent to a metal shell 33 in a well known manner. The insulating portion 31 separates the shell 33 from a central tip or axial contact 35 of the bulb means 30. This tip or central contact 35 fits complementarily to the recessed printed circuitry 15 for direct axial engagement of printed circuitry.

It is apparent that structure having features in accordance with the present invention result in an anchoring

force of the ending 24 in cooperation with the tang or tab 22-23 such that clip means 20 is resiliently urged against the insulating material due to engagement of the lugs or projection 27 against the pair of contacts 25 integral therewith during interfit axially of bulb means directly to printed circuitry in combination therewith. These features are utilized also in structures illustrated by FIGURES 3, 4 and 5 of the drawings. In these views of FIGURES 3, 4 and 5 there is shown a printed circuit means generally indicated by numeral 36. This printed circuit means includes a central conductor or continuous printed circuit portion 37 for common interconnection of various light bulb means. The common conductor or printed circuit portion 37 has at least one recess forming portion 38 similar to that designated by numeral 15 in FIGURES 1 and 2. A pair of added printed circuit portions 39 can be seen in FIGURE 3 as spaced on opposite sides of the common connector portion 37 though carried on insulating material of the printed circuit means 36.

A multi-function clip means generally indicated by numeral 40 is provided with a metal body portion 41. The metal body portion 41 has a substantially L-shaped configuration that is bifurcated at opposite ends as apparent in views of FIGURES 3 and 5. A pair of tangs or tabs 42 have free ends 43 engageable with opposite printed circuit portions 39 respectively. This interengagement of the tabs or tangs with printed circuitry portions 39 occurs as body portion 41 is fitted to the printed circuit board or insulating material at a slot or recess forming means 36R through which rounded ends 44 of the bifurcated ending of body portion 41 can be fitted. These rounded ends 44 engage the recess forming means of insulating material for lateral stabilization as well as for counteracting force of engagement of the free ends 43 as to the printed circuit portions 39. There is sufficient clearance for endings of the printed circuit portions to be formed into place without shearing. The straddling configuration of the ends 44 assure widened contact area as well as permitting the body portion 41 to jump over or straddle the central printed circuit conductor portion 37.

It is to be noted that the tab or tang means 42 are located intermediate ends of the clip means 40 and an additional stabilizing tab or tang 41T is bent laterally in a direction opposite to that of the tab or tang means 42. Intermediate location of the tang means 41T is substantially laterally in alignment with the wavy W-shaped contact means 45 representing bifurcated configuration in a location remote from that of the ends 44. Each of the wavy W-shaped contact portions 45 is provided with a guide end termination 46. These ends 46 are engaged initially by lugs or bayonet projections 47 indicated in views of FIGURES 4 and 5. It is noted that the lugs or bayonet projections 47 are in a mating and complementary fit as to a bowed central recessing of the contact means 45 in a location substantially coplanar with the stabilizing tang or tab 41T. A semi-arcuate recessing 49 in the body portion 41 between the contact means 45 assures lateral stabilization of a lamp bulb means generally indicated by numeral 50 as represented in FIGURES 4 and 5. A similar curved recessing 49T is provided axially and longitudinally at a predetermined distance from recessing 49 so that a pair of stabilizing edges are thus provided as to the lamp bulb means. A metal shell 53 of the bayonet lamp bulb means thus is positively engaged by the clip means 40 simultaneously with engagement of the lugs or bayonet projections 47 as to the wavy W-shaped contact means 45 on opposite sides of the shell 53. A central tip or contact portion 55 of the lamp bulb means engages the printed circuitry portion 38 directly for common connection with other similar lamp bulb mounting and energizing structures also carried by the printed circuit means 36.

The structures shown by the drawings represent a simplified low-cost method of connection directly between printed circuit conducting portions and a single clip means.

Resilience of the contact portions 25 and 45 of clip means is such that bayonet lamp bulbs are easily installed without any turning or twisting motion. Cost of the structures is much less than that of three piece assemblies including plastic housings and two contact springs such as disclosed by patents noted earlier. Also the features of the present invention make it possible for machine insertion of lamp bulb means having bayonet lugs or projections as well as an axial tip or contact end. Such machine insertion is particularly advantageous during mass production assembly of structures in accordance with the prior invention prior to shipment thereof to a vehicle body assembly location. The spring action and resilience of unitary clip means 20 and 40 respectively provides a cocking pressurization of the interfit of the bayonet lamp bulb means directly against printed circuit conductor means. Use of unitary multi-function clip means permits elimination of one plastic part as well as one metal contact portion in structure of patents noted earlier though retaining bulb mounting function by use of only clip means having features in combination with printed circuitry and bayonet lamp bulb means. The recessing 29 and 49 assure not only lateral stabilization but also a limit stop for lamp bulb installation while the bifurcation of the clip means between the conducting portions 39 also assure proper stop positioning of the clip means. The tangs 22 and 42 anchor the clip means vertically and prevent tipping or pivotal movement as to the printed circuit insulating material.

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. For use in combination with a centrally-tipped bayonet-projection lamp bulb means and a printed circuit means including insulating material with a recess-forming portion and at least a pair of conducting portions thereon, a unitary multi-functioning clip means comprising, a metal body portion having a substantially L-shaped configuration, at least one bifurcated ending of said metal body portion having wavy contact means which straddle and engage bayonet projections of lamp bulb means, and tab means integral with said metal body portion in engagement with at least one printed circuit conducting portion while a further printed circuit conducting portion is directly axially engaged by the centrally-tipped lamp bulb means.

2. The clip means of claim 1 wherein said wavy contact means have a W-shaped configuration centrally complementary to bayonet projections and a curved edging of said metal body portion provides lateral stabilization therebetween.

3. The clip means of claim 2 wherein said metal body portion has an additional tang integral in an intermediate location and also having a curved edge that is axially as well as longitudinally spaced a predetermined distance from said curved edging for added stabilization.

4. The clip means of claim 1 wherein bifurcated ending of said metal body portion is provided also in a location remote from said wavy contact means, said bifurcated ending including a pair of parallel-located locking tab means integral therewith.

5. The clip means of claim 4 wherein an intermediate stabilizing tab is located centrally in a direction opposite to that of said tab means and engageable with the lamp bulb means in substantially coplanar relation to the bayonet projections thereof.

6. The clip means of claim 1 wherein each of said wavy contact means has guide ends initially engaged by bayonet projections free of need for twist and turning installation of the lamp bulb means.

7. The clip means of claim 1 wherein spring resilience of said metal body portion is supplemented by axial engagement of the centrally tipped bulb means into recessing in one of the printed circuit conducting portions directly axially engaged thereby.

5

8. The clip means of claim 7 wherein a pair of tab means straddle a central common printed circuit conducting portion.

9. The clip means of claim 7 wherein recessing of the one printed circuit conducting portion is complementary to insulating material in a location substantially coplanar with bayonet projections in engagement with wavy contact means such that the bulb means has triple support against displacement from maintenance of axial positioning directly against the printed circuit conducting portion.

5

10

6

References Cited

UNITED STATES PATENTS

2,953,769	9/1960	Woofter et al.	339—17	X
3,138,419	6/1964	Hammell et al.	339—217	X
3,210,532	10/1965	Woofter et al.	339—217	X

MARVIN A. CHAMPION, *Primary Examiner.*

PATRICK A. CLIFFORD, *Examiner.*