Aug. 17, 1965 R. C. WAGNER 3,200,942

ARTICLE PACKAGING

Filed Oct. 18, 1962

FIG. 1.

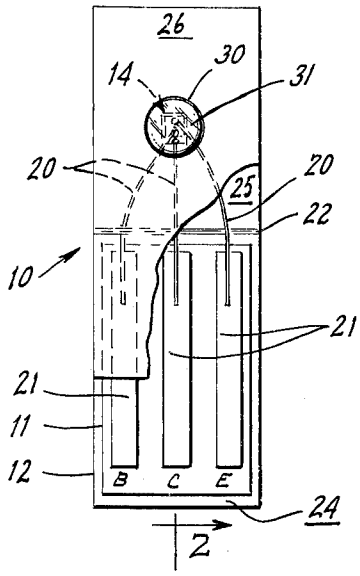


FIG. 2.

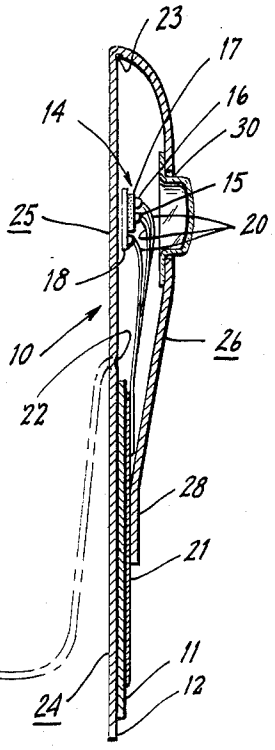
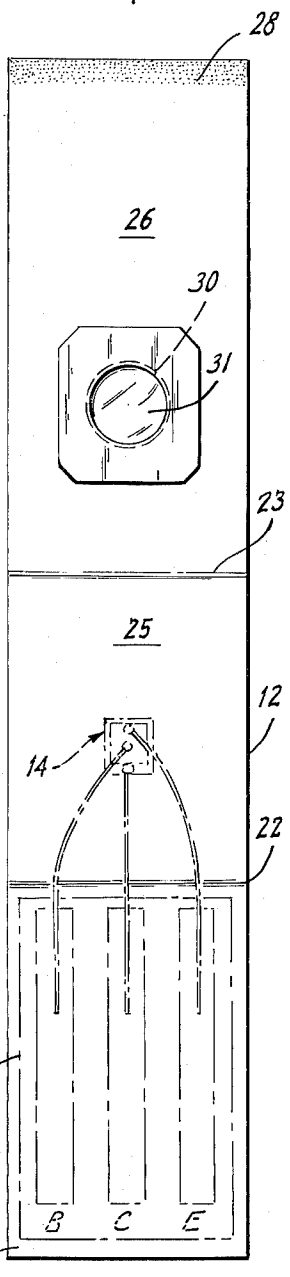


FIG. 3.



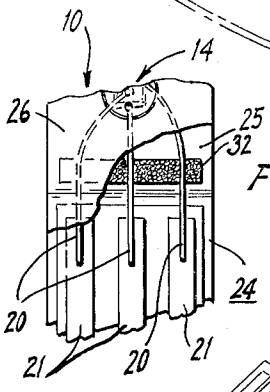


FIG. 5.

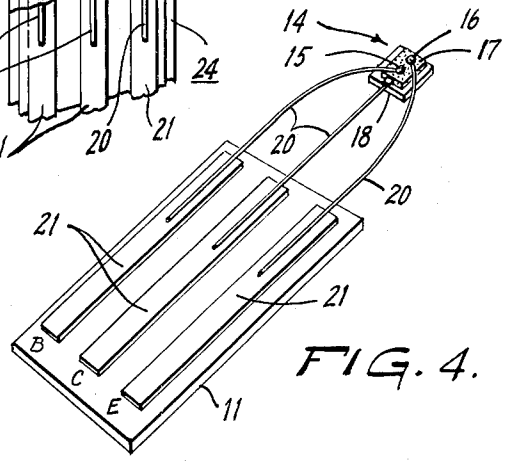


FIG. 4.

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United States Patent Office 3,200,942 Patented Aug. 17, 1965

3,200,942

ARTICLE PACKAGING

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Filed Oct. 18, 1962, Ser. No. 231,536
5 Claims. (Cl. 206—45.31)

This invention relates to article packaging, and more particularly to a novel arrangement for packaging a fragile and easily damaged article such as an unencapsulated transistor device, which includes a miniature semiconductive body supported on a minute conductive tablet and fine wire leads extending from such body and tablet.

Because of the small and delicate nature of this kind of device, it is important that it be handled with extreme care, especially in testing, shipping and and storing. Accordingly it is a primary object of the present invention to overcome the difficulties and problems customarily encountered during such handling.

Other and more specific objects of the invention have to do with the provision of a novel and improved package structure for a transistor device, which includes a part whereby the manufacturer can readily test the device before packaging, which assures maximum protection to the semiconductive body element and its associated wire leads during shipment and storage of the device, which is capable of clearly displaying the packaged device so that the user can identify it without directly handling the device itself, which allows the user to test the device without opening the package, and which facilitates handling of the device when being incorporated in a desired circuit environment.

In accordance with a preferred embodiment of the invention, a main member adapted to form a part of the improved package, is provided with conductive means to which the wire leads of the device to be packaged are connected so that the device is supported and carried by the main member. In this manner, subsequent handling can be carried out by manipulating the main member rather than the delicate device when testing the latter before it is actually packaged. The main member is associated with a covering member to complete a package assembly which, while enclosing the supported device, exposes a portion of the main member and of the conductive means thereon so that the user can test the enclosed device through said elements. Window means on the covering member displays the enclosed device so that the user can readily view it without opening the package and marking means is associated with the conductive elements to identify the leads of the device so that it can be tested while in the closed package. When opened, the package as a whole can serve as means for holding and manipulating the device to effect its connection to electrical equipment.

The full nature of the invention will be more clearly understood from the following description based on the accompanying drawing in which:

FIGURE 1 is a front elevational view of a completed packaging assembly constructed in accordance with the preferred embodiment of the invention, part of the forward flap of the covering member being broken away;

FIGURE 2 is an enlarged vertical sectional view taken substantially along line 2—2 of FIGURE 1;

FIGURE 3 is an elevational view of the blank which forms the covering member;

FIGURE 4 is a perspective view of the main member incorporated in the assembly shown in FIGURES 1 and 2, and

FIGURE 5 is a fragmentary view illustrating an additional feature of the invention.

Referring more particularly to the drawing, the packaging assembly 10 illustrated in FIGURES 1 and 2 comprises main member 11 and covering member 12. These members are so constructed and arranged as to retain and house the device 14 to be packaged. As shown the device is an unencapsulated transistor having a base portion 15, an emitter portion 16, and a collector portion 17. The collector portion is electrically connected to and supported by a flat conductive metal tablet or body 18, and elongated conductor leads 20 in the form of whisker wires which extend from said body and are electrically coupled to the mentioned base and emitter portions and to said collector supporting plate.

The main member 11 consists of a generally flat rectangular strip of non-conductive material such as cardboard. In the illustrated embodiment, a plurality of elongated conductive elements 21, one for each lead of the device 14, are affixed in spaced parallel relation over one face of the main member 11. These conductive elements are in the form of metallized ribbons which constitute extensions of the wire leads 20 of the device 14, a minor portion of the leads at their terminating end being electrically connected to said elements, and a major portion of the leads projecting beyond the member 11 so that body 18 of the device is supported by said member in a position remote therefrom.

As clearly shown in FIGURE 3, the covering member 12 is constructed from an elongated rectangular blank of non-conductive material such as cardboard. This blank has a first transversely disposed fold line 22 and a second transversely disposed fold line 23, which fold lines are arranged in parallelism and are spaced with respect to each other to divide the blank into three contiguous panels 24, 25 and 26. As seen in FIGURES 1 and 2, the first panel 24 constitutes a backing section on which the main member is mounted, the second panel 25 constitutes a rearward flap section normally extending in coplanarity with the backing section and covering one side of the device body 18 and the projecting substantial portions of leads 20, and the third panel 26 constitutes a forward flap section normally covering the other side of said device body and said lead portions. The forward flap section or third panel 26 has an adhesive coated marginal portion 28 for tacking said flap section or panel 26 in releasable engagement with a portion of the main member 11 and in a position which leaves a substantial portion of said member 11 uncovered so as to expose part of each of the conductive ribbon elements 21. The area of the aforesaid forward flap section or third panel 26 which directly overlies the body 18 of device 14, is preferably provided with an aperture 30 fitted with a member 31 of clear plastic or similar transparent material providing window means for presenting the body of the device to view.

If desired the packaging assembly 10 may be provided with non-conductive resilient means for effecting stabilization of the projecting substantial portions of whisker wire leads 20 particularly when these leads are of substantial length. For that purpose, as illustrated in FIGURE 5, a non-conductive resilient element 32 for example a pad of polyurethane foam or like spongy material, is affixed to panel 25 and disposed thereon to engage the mentioned substantial portions of the leads when the forward flap section or third panel 26 is folded over the device and sealed in position.

In utilizing the above described embodiment of the invention, the wire leads 20 of the device 14 are first affixed to the conductive ribbon elements 21; the lead connected to the base portion 15 being affixed to one conductive ribbon element which is identified by an appropriate mark such as "B"; the lead connected to the emitter portion 16 being affixed to another ribbon element which is identified by an appropriate mark such as "E"; and the lead connected

to the collector supporting tablet 18 being affixed to the remaining or third ribbon element which is identified by an appropriate mark such as "C." In this manner, as seen in FIGURE 4, the member 11 with the device 14 attached thereto form a separate unit so that once the transister leads have been properly secured, the device itself need no longer be handled directly, all handling being done by manipulation of the member 11. Thus, should testing of the device be required prior to its packaging, the testing can be done merely by bringing an instrument into contact with the conductive ribbons 21.

In the final packaging of the transistor device, the member 11 carrying the device is mounted on the backing section or panel 24 of the covering member 12, as indicated in broken lines in FIGURE 3. The panel 26 of the covering member is then folded on line 23 to form the forward flap which is brought over the transistor device so that the viewing member 31 registers therewith. Thereafter the forward flap or panel 26 is sealed along its marginal portion 28 thus completing the package assembly shown in FIGURES 1 and 2.

The purchaser of the packaged device can view and inspect it through the window means provided by the transparent member 31 and perform desired tests through the exposed portions of the conductive ribbons 21, without opening the package. In applying the transistor device in a desired circuit environment, the user merely opens the forward flap or panel 26 and, as illustrated in broken lines in FIGURE 2, folds the rearward flap or panel 25 along line 22 thereby fully exposing the device without touching it. The user can then utilize the package as a manipulating holder when effecting attachment of the wire leads 20 to appropriate connection points in the desired circuit environment. Thus attachment of the leads 20 can be made along their length beyond the member 11, the leads being thereafter severed from said member.

It will be appreciated that the invention, while shown in its preferred embodiment, is not limited to specific structures of that embodiment, but embraces such changes and variations as come within the scope of the subjoined claims.

I claim:

1. A package assembly comprising, in combination: an electronic device having elongated wire leads extending therefrom; a generally flat nonconductive package main member; a plurality of elongated conductive elements, one for each of the leads, affixed in spaced generally parallel relation over one face of the main member and constituting extensions of the leads, portions of said leads being electrically connected to the conductive elements, the remaining and substantial portions of the leads projecting beyond the main member and supporting the device in a position remote from said member; and a nonconductive covering member divided into three contiguous panels, the first panel constituting a generally flat backing section upon one face of which the main member is mounted, the second panel constituting a rearward flap section normally folded to a position in which it extends in coplanarity with the first panel and covers one side of the device and those portions of the leads which project beyond the main member, the third panel constituting a forward flap section normally folded over to a position in which it covers the other side of the device and its leads, said second and third panels, in such folded positions, being cooperatively disposed to either side of said device and its leads so that the latter are maintained in substantially fixed position, said forward flap section of said third panel in its normally folded position being fixed adhesively to a portion of the main member so that a part of each conductive element adjacent that portion of the main member is exposed and the covered device can be tested through the exposed conductive elements, said forward flap section being detachable from its recited adhesive attachment to the main member and foldable with respect to, and movable with, the rearward flap section of said second panel as it is folded to a second position in which the device is uncovered and the recited substantial portions of the leads project beyond the main member and its backing section, said lead portions thereby being exposed for connection in a circuit while the device is supported by said main member.

2. A package assembly as set forth in claim 1, in which window means is provided in the forward flap section in an area which overlies the device.

3. A package assembly as set forth in claim 1, in which means is located adjacent the exposed part of the conductive elements to identify the leads connected thereto.

4. A package assembly as set forth in claim 1, in which means for effecting stabilization of the wire leads is affixed to the second panel of the covering member, said means being disposed to engage the mentioned portions of the leads which project beyond the main member.

5. A package assembly as set forth in claim 1, in which a pad of nonconductive resilient material is affixed to the second panel and engages the mentioned portions of the wire leads which project beyond the main member to stabilize the leads.

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