June 21, 1966 T. W. KISOR 3,256,982

PACKAGING

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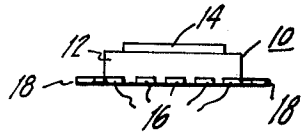
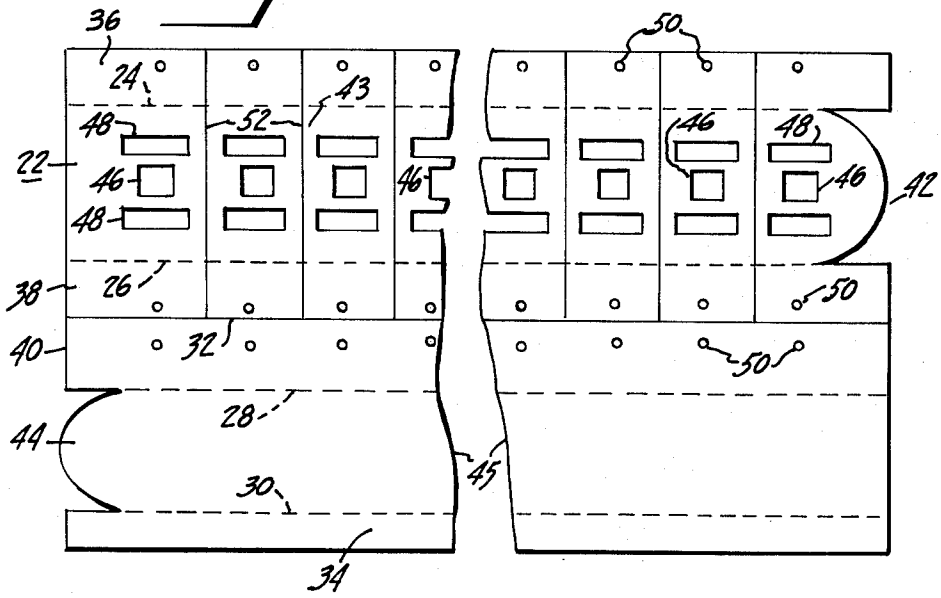


Fig. 1.

Fig. 2.



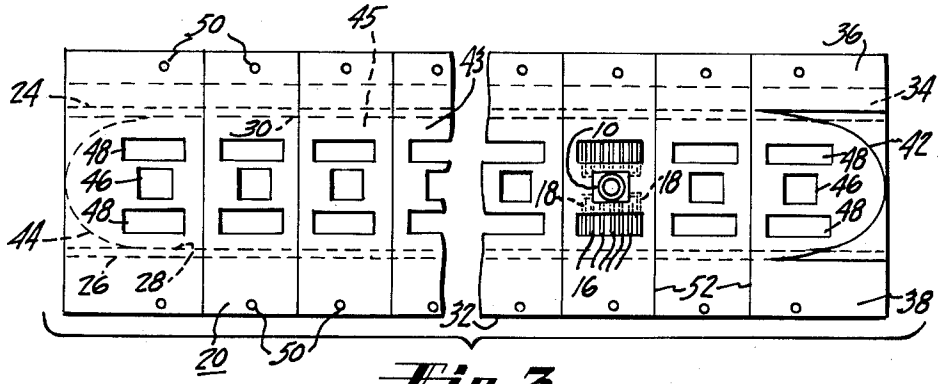


Fig. 3.

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PACKAGING

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9 Claims. (Cl. 206—56)

This invention relates to a package for holding a plurality of similar articles in an oriented position and to the combination of such a package and the article held thereby.

It is often advantageous in packaging similar articles to pack a predetermined number in an oriented position and in such manner as to permit visual examination and testing while protecting the articles from handling damage. It is also advantageous to provide a package which can be so opened as to release one article at a time or a plurality thereof; and at the same time, either retain the orientation of the articles or not retain such orientation as desired.

It is an object of this invention to provide an improved package for similar articles.

It is a further object of this invention to provide a package which retains an article in an oriented position and which permits testing the article without removing the article from the package.

It is still a further object of this invention to provide a package which retains a plurality of articles in oriented position and which permits opening the package in such a manner as to preserve the orientation thereof, or so as not to preserve the orientation, as desired.

According to one embodiment of this invention, a package comprises two elongated members each made of a packaging material, such as paper. The members are positioned one on top of the other. The edge portions along the long dimension of one member are sealed to the corresponding edge portions of the other member so that the intermediate portions of the members between the sealed edges present separable opposed surfaces. A pair of spaced tear lines each comprising a line of perforations or of slots are provided in each member, each tear line extending along and between the sealed edges of the members so as to provide a tear strip along each member. One of the tear strips has a plurality of orienting holes or openings therein spaced along the long dimension of the package, one hole being provided for each article to be held. The holes are shaped so as to conform in shape and size to a particular portion of the articles. Other holes or windows are provided in one or the other of the tear strips, there being at least one window adjacent each orienting hole to expose a portion or portions of a held article, for example, electrical leads therefrom, to permit tests on the article while in the package. If desired, feed or sprocket holes can be provided along the sealed edge portions, and lines may be inscribed across the package between each two adjacent orienting holes.

The novel features of this invention both as to its organization and method of assembly and operation as well as additional objects and advantages thereof will be understood more readily from the following description when read in conjunction with the accompanying drawing, in which:

FIG. 1 is a side elevational view of an article to be packaged,

FIG. 2 is a plan view of a blank from which the package of this invention may be constructed, and

FIG. 3 is a plan view of the package including the article of FIG. 1.

A typical article **10** to be packaged, according to the present invention can be as shown in FIGURES 1 and 3, an integrated circuit. As viewed in FIGURE 1, the integrated circuit is constructed as an article having a lower portion of ceramic insulator material **12** of rectangular shape. The article **10** also includes an upper part comprising a metallic cover lid **14** of cylindrical shape, the edges of the lid **14** being hermetically fixed to the insulator or lower portion **12** to form a chamber therewith. A silicon wafer (not shown) or other means on which electronic components such as transistors, diodes, resistors, and capacitors are deposited, is centrally mounted on the ceramic insulator **12** within the chamber formed between the lid **14** and the insulator **12**. A plurality of leads, here shown as fourteen in number, extend through the insulator **12** and into the chamber beneath the lid **14**. Jumper wires (not shown) within the chamber connect the inner ends of the leads to the components. Certain of the leads **16**, shown in FIGURE 1 as ten in number, are bent to contact the bottom of the insulator **12** and extend in contact with the bottom of the insulator **12** for a portion of their lengths with the remainder of the lead lengths extending beyond the edge of the insulator **12**. Five leads **16** are shown in the embodiment of FIGURE 1 as extending in parallel and in one direction from the article **10** with the remaining five leads **16** extending in parallel but in the opposite direction from the article **10**. Other leads **18** extend in contact with the bottom of the insulator **12** and beyond the edge of the insulator **12** for a portion of their lengths in a direction perpendicular to that of the leads **16**. The leads **18** are then bent to extend in directions parallel to the free ends of the leads **16**. A pair of leads **18** are shown in FIGURE 1 in parallel with the leads **16** extending in one direction from the article **10** with a further pair of leads **18** in parallel with the leads **16** extending in the opposite direction from the article **10**.

A package **20** for containing the article **10** can be formed from the blank **22** shown in FIGURE 2. In this figure, four spaced parallel tear lines **24**, **26**, **28** and **30** of perforations or slots are provided in a heavy flexible sheet of packaging material, thereby providing an upper **43** and a lower **45** tear strip, as viewed in FIGURE 2. The distance between the upper two tear lines **24** and **26** is greater than the distance between the lower two tear lines **28** and **30** for a purpose to be described. A fold line **32** runs between and parallel to the intermediate tear lines **26** and **28**. The fold line **32** is closer to the upper **26** of the two intermediate tear lines. The width of the edge portion **34** between the lower edge of the sheet and the lowest tear line **30** can be less than the width of the edge portion **36** between the upper edge of the sheet and the upper tear line **24**. The right edge of sheet is cut away in a fashion to provide a semi-circular tongue **42** whose periphery is approximately tangent to both upper tear lines **24** and **26**, the material between the tongue **42** and extensions of the tear lines **24** and **26** to the right of FIGURE 2 being discarded. Similarly a semicircular tongue **44** is provided at the lower left hand portion of this sheet, this tongue **44** being tangent to the lower tear lines **28** and **30**. The material between the tongue **44** and

the extensions of the tear lines 28 and 30 to the left of FIGURE 2 is discarded.

A line of equally spaced, orientation holes 46 are provided across the upper tear strip 43, the individual holes 46 being about halfway between the tear lines 24 and 26. The orientation holes 46 are shaped to fit a portion of the article to be held in oriented position. As illustrated, the holes 46 are rectangular to fit the rectangular insulator portion 12 of the described integrated circuit 10. A plurality of visual inspection or test windows 48 are provided in the tear strip 43. The windows 48 are shown as aligned rectangular slots, one on each side of each orientation hole 46 between the hole 46 and the adjacent tear lines 24 and 26. The windows 48 are positioned and shaped so that the leads 16 and 18 of the article 10 to be packaged are at least partially accessible through the windows 48. A row of sprocket or feed holes 50 can be provided between the top of the sheet and the upper tear line 24. Rows of aligned feed holes 50 are provided on both sides of the fold line 32 between it and the adjacent tear lines 26 and 28, these holes 50 being equally spaced from the fold line 32. Due to the narrow width of the edge portion 34 between the lowest tear line 30 and the lower edge of the sheet, no feed holes are provided in the lower edge portion 34. Lines 52 can be printed on the part of the blank above the fold line 32 and between each two adjacent orientating holes 46 if desired. Adhesive is applied along the lower edge portion 34 and between the upper tear line 24 and the upper row of feed holes 50. Adhesive is also applied along the portions 38 and 40 of the blank 22 between the fold line 32 and the adjacent tear lines 26 and 28 for a distance a little less than the width of the narrower portion 38.

Before loading the package, the portions 38 and 40 are glued together by so folding on the line 32 as to bring the surfaces of the portions 38 and 40 having the adhesive thereon together. In loading the package, the articles 10 are slipped between the portions 34 and 36, and are properly oriented so that the noncircular, insulator portion 12 of each article 10 fits into respective orientation holes 46 with the leads 16 and 18 extending in the direction of the windows 48. To facilitate such loading, the blank may be bent on one of lines 26 or 28 so as to separate the tear strips 43 and 45. Since the insulator portions 12 fit into the holes 46, the article 10 will be held in oriented position by the edges of the orientating holes 46. The package 20 is then completed by contacting the portions of the uppermost and lowermost strips 34 and 36 having adhesive thereon. It will be noted that neither the tear lines 24 and 30 nor the tear lines 26 and 28 register but they are offset from each other for a purpose to be explained. The adhesive can then be cured, whereby a package is provided in which the articles 10 are held in oriented position by engagement with the orienting holes 46 in the strip 43. The leads 16 and 18 of the article 10 positioned on opposite sides of the hole 46 are held against the tear strip 43 by the other tear strip 45 of packaging material. The packaged articles 10 are protected from handling, and the leads 16 and 18 are accessible without destroying the package for testing the article.

Since the package can be made of paper, it is cheap and can be thrown away when used. Individual packages can be stacked, or the package can be made as long as desired and stored on a reel. The individual package or the long package may be fed by a sprocket feeding means to an article using position. If one or the other of the tear strips is removed, the remaining portion of the package can be used as a holding tray. If one article or less than a full package is desired, the package may be cut on the lines 52 in any convenient manner. If the package is to be emptied and the orientation of the articles need not be preserved, the tongue 42 forming a part of the tear strip 43 including the orientation holes 46 can be grasped and the tear strip 43 removed by pulling the strip 43 away from the remainder of the package 20. When the strip 43 is removed, the articles 10 will then no longer be held and can slide or fall into a container (not shown). If the package 20 is to be opened and the orientation of the articles is to be preserved, the package is held with the tear strip 45 at the top. The tear strip 45 is removed by grasping the tongue 44 and pulling the strip 45 away from the remainder of the package 20. The articles 10 will then be removable, but since a portion 12 of each article 10 sits in one of the orienting holes 46, the orientation of the articles 10 is preserved. Furthermore, if less than all the articles 10 are to be removed in either an oriented or non-oriented manner, an appropriate tear strip 43 or 45 can be torn away only from articles 10 that are to be removed, whereby the remaining articles 10 are held in the package. The remaining articles 10 can be removed at a later time in either an oriented or non-oriented manner as desired and without regard as to how previous articles 10 were removed. The offset between the tear lines mentioned above strengthens the package since longitudinal bending on a tear line is resisted by this offset.

Although only a single form of package structure particularly adapted to hold integrated circuits of a given construction in an oriented position has been shown and described, by way of example, it will undoubtedly be apparent to those skilled in the art that variations thereof are possible within the spirit of the present invention. For example, the lower margin 34 can be made wider, in which case properly positioned feed holes 50 can be provided therealong. Or the feed holes 50 can be provided after the package is formed by folding on the fold line 32. Or the package may be made of two sheets laid one on the other rather than of one sheet folded over as described. In this case, one sheet takes the shape of the blank above the fold line 32 and the other sheet takes the shape of the blank below the fold line 32. Or the tongues 42 and 44 can extend from the same or from either end edge of the blank 22 or be omitted entirely. Hence, it should be understood that the foregoing description is to be considered as illustrative and not in a limiting sense.

What is claimed is:

1. A package for holding at least one article in an oriented position comprising

a member of packaging material substantially flat throughout its complete extent and having spaced parallel side portions,

there being at least one orientation hole in said member between said spaced parallel side portions for receiving a portion of said article in oriented position,

there further being at least one window in said member adjacent to said orientation hole and also between said spaced parallel side portions, and

means to hold a portion of said article against a surface of said member in the vicinity of said window with another portion of said article in said orientation hole,

said means comprising a second member of packaging material substantially flat throughout its complete extent and having two spaced parallel side portions, and

means to hold said first and second members together with said spaced parallel side portions of one member in contact with said spaced parallel side portions of said other member, the resultant package formed by said two members being substantially flat throughout its complete extent in the absence of an article between said members, the insertion of an article between said members causing bowing of said package.

2. A package for containing at least one article in an oriented position consisting solely of

two members of packaging material which are both substantially flat throughout their complete extents, said members each presenting at least a first and a second parallel edge portion,

said members being fixed together along said parallel edge portions so that the intermediate portions of said members between said edge portions are in contact in the absence of an article therebetween,

spaced parallel tear lines in one of said members between and extending parallel to said fixed edge portions providing a tear strip in said one member,

there being at least one orientation hole in the other of said members located between the tear lines in said one member.

3. A package for containing at least one article in an oriented position consisting solely of

two members of packaging material which are both substantially flat throughout their complete extents, said members each presenting at least a first and a second parallel edge portion,

said members being fixed together along said opposed edge portions so that the intermediate portions of said members between said edge portions are in contact in the absence of an article therebetween,

spaced tear lines in one of said members between and extending parallel to said fixed edge portions providing a tear strip in said one member,

there being at least one orientation hole for receiving a portion of said article in the other of said members located between the tear lines in said one member, and

at least one window in one of said members adjacent to said orientation hole.

4. A package for containing at least one article in an oriented position consisting solely of

two members of packaging material which are substantially flat throughout their complete extents, said members each presenting at least a first and a second parallel edge portion,

said members being fixed together along said opposed edge portions,

the intermediate portions of said members between said edge portions being in contact in the absence of an article therebetween and presenting separable opposed surfaces,

first and second spaced tear lines in each member between and extending along said fixed edge portions providing a tear strip in each member between said tear lines,

there being at least one orientation hole in one of said tear strips for receiving a portion of said article, and

there being at least one test window in one of said tear strips in the vicinity of each of said orienting holes.

5. A package for containing articles in oriented position and for permitting testing thereof while in said package consisting solely of

two members of packaging material which are substantially flat throughout their complete extents, said members each presenting at least a first and a second parallel edge portion,

said members being fixed together along said parallel edge portions,

the intermediate portions of said members between said edge portions being in contact in the absence of an article therebetween and presenting separable opposed surfaces,

a pair of spaced tear lines in each of said members parallel to and between said fixed edges providing tear strips in the intermediate portions of each of said members,

there being a line of orientation holes in one of said tear strips and windows in said one tear strip respectively adjacent to said orientation holes.

6. The combination of a package and an article to be held thereby in an oriented position, said article having

leads extending therefrom and having a noncircular body portion, comprising

a member of flat packaging material,

there being an orientation hole in the intermediate portion of said member of the size and shape to fit said noncircular body portion and to hold said article in an oriented position,

said article being positioned with said noncircular body portion received in said orientation hole and with said leads extending along said member, and

means to hold said leads against said member.

7. The combination of a package and an article to be held thereby in an oriented position, said article having leads extending therefrom and having a noncircular body portion, comprising

a member of flat packaging material,

there being an orientation hole in the intermediate portion of said member of the size and shape to fit said noncircular body portion and to hold said article in an oriented position,

said article being positioned with said noncircular body portion received in said orientation hole and with said leads extending along said member, there being at least one window in said member of said package in a position to expose said leads, and

means to hold said leads against said member.

8. The combination of a package and an article to be packaged therein in an oriented position, said article having leads extending therefrom and having a noncircular body portion, comprising

two members of packaging material presenting opposed edge portions, said members being substantially flat throughout their complete extent in the absence of said article,

said members being fixed together along said opposed edge portions,

the intermediate portions of said members between said edge portions presenting separable opposed surfaces,

there being an orientation hole in the intermediate portion of one of said members of the size and shape to fit said noncircular body portion and to hold said article in an oriented position,

said article being positioned in said package between said separable opposed surfaces with said noncircular body portion received in said orientation hole and with said leads extending between said members, said article causing slight bowing of said members,

there being at least one window in one of said members of said package in a position to expose said leads.

9. The combination of a package and articles to be packaged therein in an oriented position, said articles each having leads extending therefrom and each having similar noncircular body portions, said package comprising

two members of packaging material presenting opposed parallel edge portions, said members being substantially flat throughout their complete extent in the absence of said article,

said members being fixed together along said opposed edge portions,

the intermediate portions of said members between said edge portions presenting opposed separable surfaces,

there being a pair of spaced tear lines in each of said intermediate portions arranged parallel to said fixed edge portions and providing a tear strip in each of said members,

there being a line of orientation holes along one of said tear strips of a size and shape to fit said noncircular body portions and to hold said articles in oriented position, said articles being positioned between said tear strips with the noncircular body portions thereof seated in said orienting holes, whereby said article causes slight bowing of said members,

there being at least one line of windows in one of said tear strips,

said windows being adjacent to respective orientation holes and positioned to expose at least one of the leads of the article seated in the adjacent orientation hole.

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