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(54) Title: LUGS, METHOD OF MAKING LUGS, SUPPORT ASSEMBLIES AND METHOD OF SUPPORTING ARTICLES

(57) Abstract: The present invention discloses a support assembly (10) wherein a lug (12) is fitted to a support element (14) for supporting articles. The lug (12) and the support assembly can be of multi layered laminates. The lug (12) may be provided with flaps for providing rigidity to the support assembly (10). The support assembly (10) is light in weight, cost effective and easy to manufacture.

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LUGS, METHOD OF MAKING LUGS, SUPPORT ASSEMBLIES AND METHOD OF SUPPORTING ARTICLES

FIELD OF INVENTION

The present invention relates to a packaging.

Particularly, the present invention relates to packaging using a laminate.

DEFINITIONS

In this specification, the following terms have the following definitions as given alongside. These are additions to the usual definitions expressed in the art.

"Lug" is defined as an element that enables in holding or supporting an article and includes an integrated or integrable fitment, a stay, a removable fixture, a separator, a support, a boss or a projection.

BACKGROUND OF THE INVENTION

Fitments, separators or fixtures are required for holding, stacking, separating, dividing, cushioning, supporting, protecting in and around an article within a box/carton/container in order to transport/store them safely and securely. Such fitments provide partitions and/or support to articles against any possible rubbing or damage.

Traditionally, cardboard sheets or corrugated boards are arranged operatively vertically and horizontally to provide a separation between groups of the articles packed in a container. However, such fitments are

loose are easily displaced from their packed configuration and can result in damage of the articles to be transported. When a vertical load is applied on a fixture of the prior art, it causes deformation of the fixture resulting in its failure to hold articles and threreby resulting in damage of the articles. This displacement/misalignment of the fixtures is the failure of the fitments, separator or fixtures during transportation.

As time has passed by, the packaging also has undergone lot of changes to adapt to the need for the type or category and the quantity of the articles to be transported. Unit packaging of articles of 25 to 50 kgs in a box are now packed in bulk units of 500 kgs stacked on a pallete and packaging may be carried without providing side walls.

The packaging of bulk units today requires various kinds of fittings, fitments, separator and fixtures to arrest and position articles to be transported in the packed configuration from the point of packing to the point of usage. Currently fitments are generally manufactured from plastics, wood, metals and the like depending on the article and purpose of fixtures. Such fittings, fitments, separator and fixtures are fitted and supported onto a pallete/support element made of similar or different material as the fittings, fitments, separator and fixtures.

An example of fittings, fitments, separator and fixtures used for packaging in the modern times is packaging for Polyester Oriented Yarn (POY). The Polyester Oriented Yarn is wound on a paper tube and is packed in Corrugated Fibre Box of in units of 4 tubes to 8 tubes weighing approximately 40 to 50 kg. Plastic cups integrated with corrugated sheets are used as fitments to hold these POY tubes inside the box in packed configuration by fixing to the inner side of the tube. The plastic cups can be uni-directional or bi-directional. However, such plastic fittings, fitments, separator and fixtures are expensive and are not environment friendly.

Several attempts have been made to manufacture a packaging having a fitting, fitment, separator or fixture integrated with a pallet.

Accordingly, **Chinese Patent CN 2782577** discloses a paper pallet structure comprising a top structure and at least one bottom body structure and a plurality of supporting body to card board material. The bottom structure and the top structure are provided with grooves formed on one surface of the bottom structure and the top structure. The supporting body is fitted at one end to a groove formed on the top structure and on the other end to the groove formed on the bottom structure. However, one disadvantage of **CN 2782577** is that it requires a top structure, a bottom structure and supporting

bodies which increases the need for the paper material besides adding to the cost and the time required for manufacturing.

Again, **United States Patent US 2532295** discloses a pallete having a platform member and a plurality of supporting blocks. The supporting blocks are arranged in spaced apart parallel rows. The supporting blocks are made of plurality of superimposed units formed from corrugated cardboard elements which are secured to each other by adhesive. The supporting blocks are adhesively secured to the platform member. However, one disadvantage of the **US 2532295** is that it involves supporting blocks which are made of super imposed units formed from corrugated cardboard elements which are secured to each other by adhesive, which result in the increase in the quantity of corrugated cardboard elements required for obtaining a stable structure which adds to the cost of manufacturing.

Therefore, there was felt need for a packaging system which can overcome the disadvantages of the prior art.

OBJECT OF THE INVENTION

An object of the present invention is to provide a support assembly which is simple in construction.

Another object of the present invention is to provide a support assembly which is cost effective.

Yet another object of the present invention is to provide a support assembly which offers structural rigidity.

Further another object of the present invention is to provide a support assembly which is easy to manufacture.

An added advantage of the present invention is that it sis light in weight.

SUMMARY OF THE INVENTION

In accordance with present invention there is provided a lug defined by a resilient body of predetermined shape, the body formed from a laminate, the lug having defined thereon means to removably fit the lug on or through a support element.

Typically, the body is regular or irregular in shape.

Typically, the body defines a hollow.

Typically, the body has a cross section selected from the group consisting of a triangle, a rectangle, an arcuate, a square, a trapezoid, polygon, a star, a swastika, a Y, an X, a C, an S, a petal and a combination thereof.

The lug as claimed in claim 1, wherein the body is defined by a shape contouring an article to be supported by the lug.

Typically, laminate has a multiple layer and a layer of the laminate is selected from a group consisting of paper, kraft paper, card paper, paper board, corrugated paper, a combination of paper and a polymer, a

combination of paper and fabric and a combination of paper, fabric and polymer.

Typically, the body is formed by folding a laminate to form flaps.

Typically, the body is formed by providing at least one foldable panel on the laminate.

Typically, the laminate is scored to define panels.

Typically, the panels extend into flaps which can be folded inwards or outwards.

Typically, the flaps are fastened to the panel by fastening means in the operative folded configuration of the flaps.

Typically, the fastening means are selected from the group comprising staples, rivets, adhesive, clips, Velcro, hooks, thermal bond, eyelets, stitches and double sided adhesive tapes.

Typically, the flaps are provided with foldable fins for stabilizing the lug in its operative fitted configuration on a support element.

Typically, the lug includes flaps provided at both ends of the lug and a channel formed between the flaps.

Typically, the lug includes a flap and a fin at both ends of the lug and a channel formed between the flap and fin sets.

Typically, the lug includes a flap provided at one end and a fin provided at the other end.

Typically, notches are provided to assist in the formation of the body.

Typically, the notches are provided between the panels.

Typically, the notches act as guides for supporting articles on the lug.

Typically, the means to removably fit the lug to a support element is formed by forming at least one channel between the folded flaps of the panels in the operative folded configuration, the channel adapted to accommodate a member of a support element in the operative fitted configuration of the lug.

Typically, the channel is provided substantially centrally along the body on its outer or inner surface.

Typically, the channel is provided substantially at one end of the body.

Typically, the body in its formed configuration is resiliently compressible.

In accordance with the present invention there is provided a support assembly comprising:

- at least one lug; and
- a support element having means to removably receive at least one of the lugs.

Typically, the support element is a laminate, the laminate has a multiple layer and a layer of the laminate is selected from a group consisting of paper, kraft paper, card paper, paper board, corrugated paper, a combination of paper and a polymer, a combination of paper and fabric and a combination of paper, fabric and polymer.

Typically, the support element and the lug are of the same material.

Typically, the means to receive the lug is an aperture configured to contour the body of the lug in its formed configuration.

Typically, the aperture has a cross-section selected from the group consisting of a triangle, a rectangle, arcuate, a square, a trapezoid, a polygon, a star, a swastika, a Y, an X, a C, an S, a petal and a combination thereof.

Typically, the cross-section of the aperture is equal to or less than at least one of the cross sections of the lug to enable the lug to be resiliently removably force fitted in the aperture.

Typically, the width across the channel in the lug is slightly greater than the thickness of the sides of the aperture.

Typically, slits are provided along the walls of the aperture to provide resilience to the walls of the aperture in the operative fitted configuration of the lug in the aperture.

Typically, a support assembly comprising a plurality of lugs is fitted in a plurality of apertures of a support element.

Typically, the support assembly comprises a plurality of support elements, each support element comprising a plurality of lugs removably fitted thereto.

Typically, a support assembly is adapted to support articles located between two opposing lugs.

Typically, the support element bearing lugs thereon are stacked operatively vertically and are adapted to support articles to be supported therebetween.

In accordance with the present invention there is provided a method of forming a support assembly, the comprising the steps of:

- forming a body of at least one lug by deforming a laminate;
- providing a support element having at least one aperture to receive the lug; and

- force fitting the formed lug into the aperture by resiliently compressing the body.

Typically, the step of forming includes providing a planar element and forming a body of a lug by deforming the planar element.

Typically, the step of forming includes forming panels on the planar element.

Typically, the step of forming includes folding the planar element to form the body.

Typically, the step of forming includes forming the body by bringing the panels together.

Typically, the step of forming includes providing a panel with flaps.

Typically, the step of forming includes folding the flaps and fastening the flaps to the panel.

Typically, the step of forming includes providing notches between panels.

Typically, the step of forming includes forming fins from foldable extension of the flaps.

Typically, the step of providing support element includes the step of forming slits along the apertures to provide resilience.

Typically, the step of force fitting includes locating the body of the lug in an aperture via channels formed on the body.

A transport package for transporting articles typically textile bobbins comprising a housing and a plurality of support assemblies which supports there between a plurality of the articles by means of the articles by means of plurality of lugs fitted in the support elements of the support assemblies.

BRIEF DESCRIPTION OF THE FIGURES

Other aspects of the invention will become apparent by consideration of the accompanying drawing and their description stated below, which is merely illustrative of a preferred embodiment of the invention and does not limit in any way the nature and scope of the invention.

Figure 1 illustrates a support assembly in accordance with the present invention;

Figure 2 illustrates a lug of the support assembly in accordance with the present invention;

Figure 3 illustrates a support element of the support assembly in accordance with the present invention;

Figure 4 to **figure 13** illustrate various embodiments of the lug fitted to the support element as shown in **figure 1**;

Figure 14 to **figure 17** illustrate the formation of the lug;

Figure 18 illustrates a support assembly having a plurality of lugs assembled on to a support element; and

Figure 19 to **figure 22** illustrate the method of assembling of the lug with the support element.

DETAILED DESCRIPTION

The invention will now be described with reference to the accompanying drawings which do not limit the scope and ambit of the invention. The description provided is purely by way of example and illustration.

Figure 1 illustrates a support assembly (10) having a lug (12), shown in **figure 2**, to resiliently and removably cooperate with a support element (14), shown in **figure 3**.

The lug (12), shown in **figure 2**, is provided with flaps (22a and 22b) extending from a resiliently compressible body (13). The body (13) is typically hollow and is regular or irregular in shape. The body has a cross section which is selected from the group consisting of a triangle, a rectangle, an arcuate, a square, a trapezoid, polygon, a star, a swastika, a Y, an X, a C, an S, a petal or a combination of various cross sections. **Figure 4** to **figure 13** illustrate the various embodiments of the lug (12). The lug (12) and the support element (14) are made of laminate (16) having multiple layers. The laminate is made of paper, kraft paper, card paper, paper board, corrugated paper, a combination of paper and a polymer, a combination of paper and fabric or a combination of paper, fabric and polymer. The lug (12) and the support element (14) are made of the same material or of different materials.

The lug (12) is formed from the laminate (16), shown in **figure 14**, of a predetermined length, breadth and thickness. The laminate (16) is provided with scores (17a, 17b and 17c) to form panels (20a, 20b, 20c and 20d) and scores (18a, 18b, 18c and 18d) to form flaps (22a and 22b) extending from at two substantially parallel edges of the panels (20a, 20b, 20c and 20d). The scores (18a and 18d) defines fins (24a and 24b) extending from the flaps (22a and 22b) respectively. The flaps (22a and 22b) are folded over the panels (20a, 20b, 20c and 20d), such that the plane of the flaps (22a and 22b) in the folded configuration is substantially parallel to the plane of the panels (20a, 20b, 20c and 20d) so as to define a channel (26) between the flaps (22a and 22b). The flaps (22a and 22b) are folded either on one side or both sides

of the panels (20a, 20b, 20c and 20d), shown in **figure 15** and **figure 16**. The panels (20a, 20b, 20c and 20d) are bent along the scores (17a, 17b and 17c) so as to form the body (13). A notch (not shown in figure) is provided between each panel (20a, 20b, 20c and 20d) to act as guides for supporting articles on the lug (12) and also enable in formation of the body. The portion of the scores (17a, 17b and 17c) between the scores (18b and 18c) may be provided with cuts so as to separate the flaps (22a and 22b). The fins (24a and 24b) are folded so as to be substantially perpendicular to the plane of the panels (20a, 20b, 20c and 20d). The fins (24a and 24b) enables in stabilizing the lug (12) in its operative fitted configuration on the support element (14). The flaps (22a and 22b) are fastened to the panels (20a, 20b, 20c and 20d) by fastening means (not shown in figure) in the operative folded configuration of the flaps (22a and 22b) to form the lug (12) shown in **figure 17**. The fastening means (not shown in figure) is selected from the group comprising staples, rivets, adhesive, clips, Velcro, hooks, thermal bond, eyelets, stitches and double sided adhesive tapes.

The channel (26) formed is provided substantially at one end of the body or substantially centrally along the body formed by the panels (20a, 20b, 20c and 20d) on its outer or inner surface. The channel (26) is defined either between a flap (22a and 22b) and fin (24a and 24b) sets or is defined between a flap (22a or 22b) and a fin (24a or 24b). The flaps (22a and 22b) and/or fins (24a or 24b) in their operative folded configuration together with the channel (26), act as a means to resiliently and removably fit the lug (12) to the support element (14).

The support element (14), shown in **figure 3**, has a predetermined length, breadth and thickness and is provided with apertures (28) which acts as

means to removably receive the lug (12) to form the support assembly (10) as shown in **figure 1**. The cross section of aperture (28) is such that the wall of the aperture (28) is configured to contour the body formed from the panels (20a, 20b, 20c and 20d). The cross-section of the aperture (28) is typically selected the group consisting of a triangle, a rectangle, arcuate, a square, a trapezoid, a polygon, a star, a swastika, a Y, an X, a C, an S, a petal and a combination of various shapes. The cross-section of the aperture (28) is equal to or less than the cross sections of the lug (12) to enable the lug (12) to be resiliently and removably force fitted in the aperture (28) that is the width across the channel (26) of the lug (12) is slightly greater than the thickness of the sides of the aperture (28). A plurality of slits (30) are provided along the walls of the aperture (28) in order to provide resilience to the walls of said aperture (28) in the operative fitted configuration of the lug (12) in the aperture (28). A plurality of apertures (28) may be formed on the support element (14) to enable fitment of a plurality of lugs (12), as shown in **figure 18**. A plurality of support assemblies (10) bearing lugs (12) are stacked operatively vertically so as to support articles located between two opposing lugs (12) of two support elements (14).

Figure 19 to **figure 22** illustrate the method of forming the support assembly (10). The lug (12), with the formed flap (22a and 22b) and/or fins (24a and 24b) on the body, is positioned over the aperture (28) such that the contour of the lug (12) is aligned with the contour of the aperture (28). The lug (12) is then forced through the aperture (28) until the channel (26) of the lug (12) snugly abut the aperture (28) in the operative fitted configuration of the lug (12) and support element (14). On fitting the lug (12) into the aperture (28), the fins (24a and 24b) are allowed to rest on the support

element (14), thus forming the support assembly (10). The article to be supported on the support assembly (10) contoured by the lug (12) and either abut the body of the lug (12) or the flaps (22a and 22b) of the lug (12).

TECHNICAL ADVANTAGES AND ECONOMIC SIGNIFICANCE

The product as described herein above offers several advancements over similar products disclosed in the prior art. The present invention is easy to manufacture and offer cost effective method of transporting articles. The present invention is light in weight. Further, the support assembly is made of degradable material and hence is environment friendly.

In view of the wide variety of embodiments to which the principles of the present invention can be applied, it should be understood that the illustrated embodiments are exemplary only. The numerical values given of various physical parameters and dimensions are only approximations and it is envisaged that the values higher or lower than the numerical values assigned to the parameters, dimensions and quantities fall within the scope of the invention.

While considerable emphasis has been placed herein on the components and component parts of the preferred embodiments, it will be appreciated that many embodiments can be made and that many changes can be made in the preferred embodiments without departing from the principles of the invention. These and other changes in the preferred embodiment as well as other embodiments of the invention will be apparent to those skilled in the art from the disclosure herein, whereby it is to be distinctly understood that

the foregoing descriptive matter is to be interpreted merely as illustrative of the invention and not as a limitation.

Claims:

1. A lug defined by a resilient body of predetermined shape, said body formed from a laminate, said lug having defined thereon means to removably fit the lug on or through a support element.
2. The lug as claimed in claim 1, wherein said body is regular or irregular in shape.
3. The lug as claimed in claim 1, wherein said body defines a hollow.
4. The lug as claimed in claim 1, wherein said body has a cross section selected from the group consisting of a triangle, a rectangle, an arcuate, a square, a trapezoid, polygon, a star, a swastika, a Y, an X, a C, an S, a petal and a combination thereof.
5. The lug as claimed in claim 1, wherein said body is defined by a shape contouring an article to be supported by the lug.
6. The lug as claimed in claim 1, wherein said laminate has a multiple layer and a layer of said laminate is selected from a group consisting of paper, kraft paper, card paper, paper board, corrugated paper, a combination of paper and a polymer, a combination of paper and fabric and a combination of paper, fabric and polymer.
7. The lug as claimed in claim 1, wherein said body is formed by folding a section of the laminate to form flaps.
8. The lug as claimed in claim 1, wherein said body is formed by providing at least one foldable panel on a section of said laminate.

9. The lug as claimed in claim 7, wherein said laminate is scored to define panels.

10. The lug as claimed in claim 8, wherein said panels extend into flaps which can be folded inwards or outwards.

11. The lug as claimed in claim 10, wherein said flaps are fastened to said panel by fastening means in the operative folded configuration of the flaps.

12. The lug as claimed in claim 11, wherein said fastening means are selected from the group comprising staples, rivets, adhesive, clips, Velcro, hooks, thermal bond, eyelets, stitches and double sided adhesive tapes.

13. The lug as claimed in claim 10, wherein said flaps are provided with foldable fins for stabilizing said lug in its operative fitted configuration on a support element.

14. The lug as claimed in claim 1, wherein said lug include flaps provided at both ends of said lug and a channel formed between said flaps.

15. The lug as claimed in claim 1, wherein said lug include a flap and a fin at both ends of said lug and a channel formed between said flap and fin sets.

16. The lug as claimed in claim 1, wherein said lug includes a flap provided at one end and a fin provided at the other end.

17. The lug as claimed in claim 1, wherein notches are provided to assist in the formation of said body.

18. The lug as claimed in claim 17, wherein said notches are provided between said panels.

19. The lug as claimed in claim 17, wherein said notches acts as guides for supporting articles on said lug.

20. The lug as claimed in claim 1, wherein said means to removably fit said lug to a support element is formed by forming at least one channel between said folded flaps of said panels in the operative folded configuration, said channel adapted to accommodate a member of a support element in the operative fitted configuration of the lug.

21. The lug as claimed in claim 20, wherein said channel is provided substantially centrally along the body on its outer or inner surface.

22. The lug as claimed in claim 20, wherein said channel is provided substantially at one end of the body.

23. The lug as claimed in claim 1, wherein said body in its formed configuration is resiliently compressible.

24. A support assembly comprising:

- at least one lug according to any of the preceding claims 1 to 23; and
- a support element having means to removably receive at least one of said lugs.

25. The support assembly as claimed in claim 24, wherein said support element is a laminate, said laminate has a multiple layer and a layer of said laminate is selected from a group consisting of paper,

kraft paper, card paper, paper board, corrugated paper, a combination of paper and a polymer, a combination of paper and fabric and a combination of paper, fabric and polymer.

26. The support assembly as claimed in claim 24, wherein said support element and said lug are of the same material.

27. The support assembly as claimed in claim 24, wherein said means to receive said lug is an aperture configured to contour said body of said lug in its formed configuration.

28. The support assembly as claimed in claim 27, wherein said aperture has a cross-section selected from the group consisting of a triangle, a rectangle, arcuate, a square, a trapezoid, a polygon, a star, a swastika, a Y, an X, a C, an S, a petal and a combination thereof.

29. The support assembly as claimed in claim 27, wherein the cross-section of said aperture is equal to or less than at least one of the cross sections of said lug to enable said lug to be resiliently removably force fitted in said aperture.

30. The support assembly as claimed in claim 24, claims 20 to 22 and claim 27, wherein the width across said channel in said lug is slightly greater than the thickness of the sides of said aperture.

31. The support assembly as claimed in claim 24, wherein slits are provided along the walls of said aperture to provide resilience to the walls of said aperture in the operative fitted configuration of said lug in said aperture.

32. The support assembly as claimed in claim 24, wherein a support assembly comprising a plurality of lugs as claimed in any of the preceding claims is fitted in a plurality of apertures of a support element.

33. The support assembly as claimed in claim 24, comprising a plurality of support elements, each support element comprising a plurality of lugs removably fitted thereto.

34. The support assembly as claimed in claim 24, wherein a support assembly is adapted to support articles located between two opposing lugs.

35. A support assembly as claimed in claim 24 to 34, wherein the support element bearing lugs thereon are stacked operatively vertically and are adapted to support articles to be supported therebetween.

36. A method of forming a support assembly, said comprising the steps of:

- forming a body of at least one lug by deforming a laminate;
- providing a support element having at least one aperture to receive said lug; and
- force fitting the formed lug into said aperture by resiliently compressing the body.

37. The method as claimed in claim 36, wherein the step of forming includes providing a planar element and forming a body of a lug by deforming the planar element.

38. The method as claimed in claim 36, wherein the step of forming includes forming panels on said planar element.

39. The method as claimed in claim 36, wherein the step of forming includes folding the planar element to form said body.

40. The method as claimed in claims 36 and 38, wherein the step of forming includes forming the body by bringing the panels together.

41. The method as claimed in claims 36 and 38, wherein the step of forming includes providing a panel with flaps.

42. The method as claimed in claims 36 and 38, wherein the step of forming includes folding said flaps and fastening said flaps to the panel.

43. The method as claimed in claims 36 and 38, wherein the step of forming includes providing notches between panels.

44. The method as claimed in claims 36 to 43, wherein the step of forming includes forming fins from foldable extension of said flaps.

45. The method as claimed in claim 36, wherein the step of providing support element includes the step of forming slits along the apertures to provide resilience.

46. The method as claimed in claim 36, wherein the step of force fitting includes locating said body of said lug in an aperture via channels formed on said body.

47. A transport package for transporting articles typically yarn tubes and bobbin comprising a housing and a plurality of support

assemblies as claimed in any of the claims 24 to 35, supporting there between a plurality of said articles by means of plurality of lugs fitted in said support elements of said support assemblies.

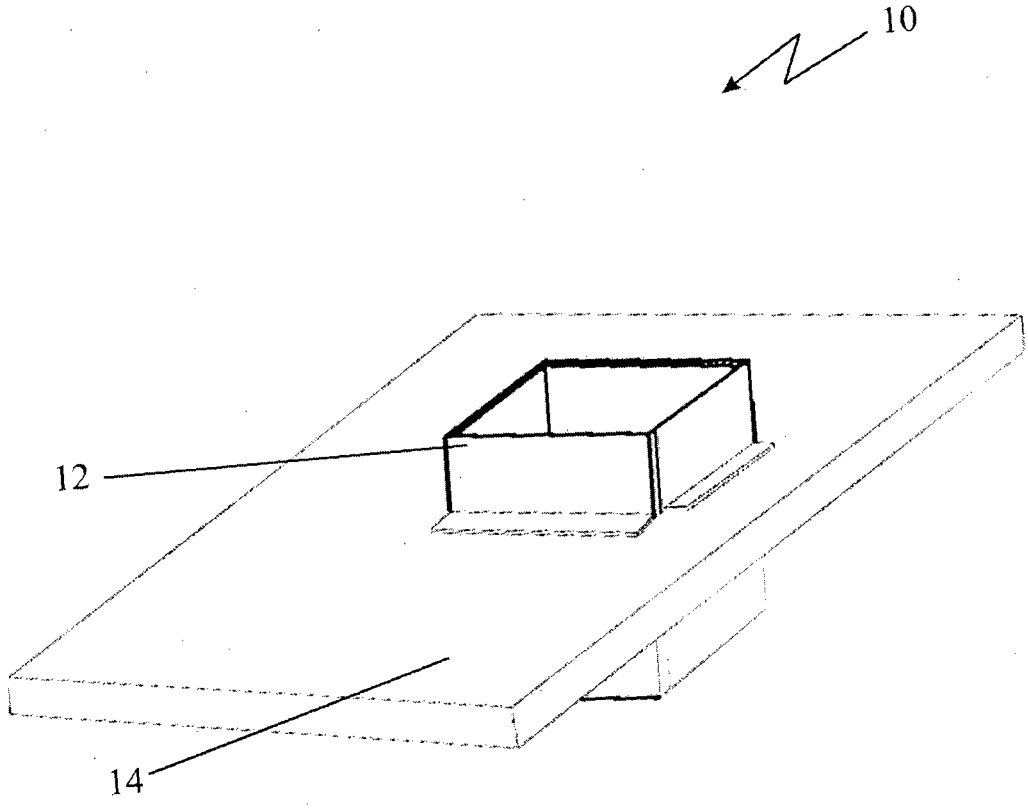


FIGURE 1

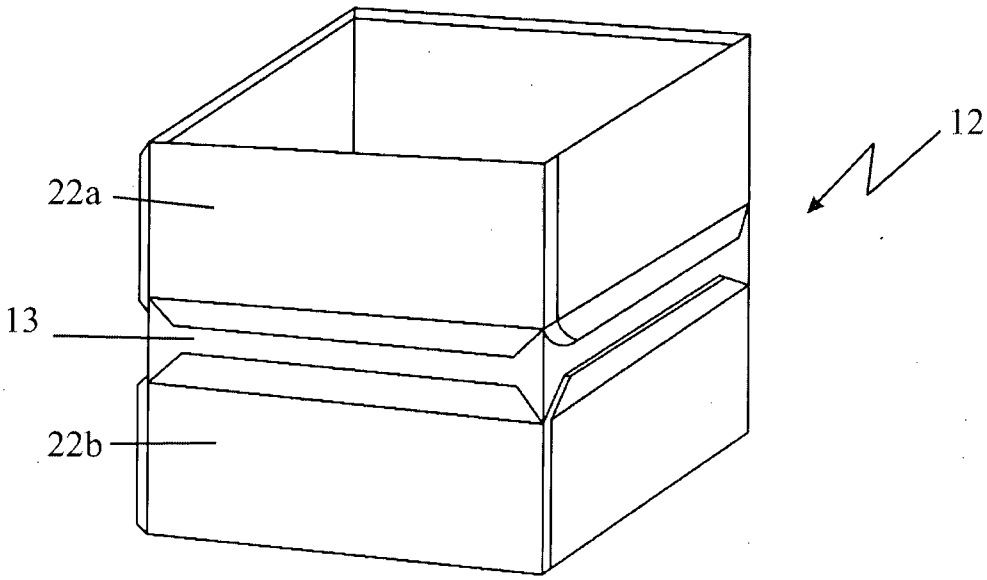


FIGURE 2

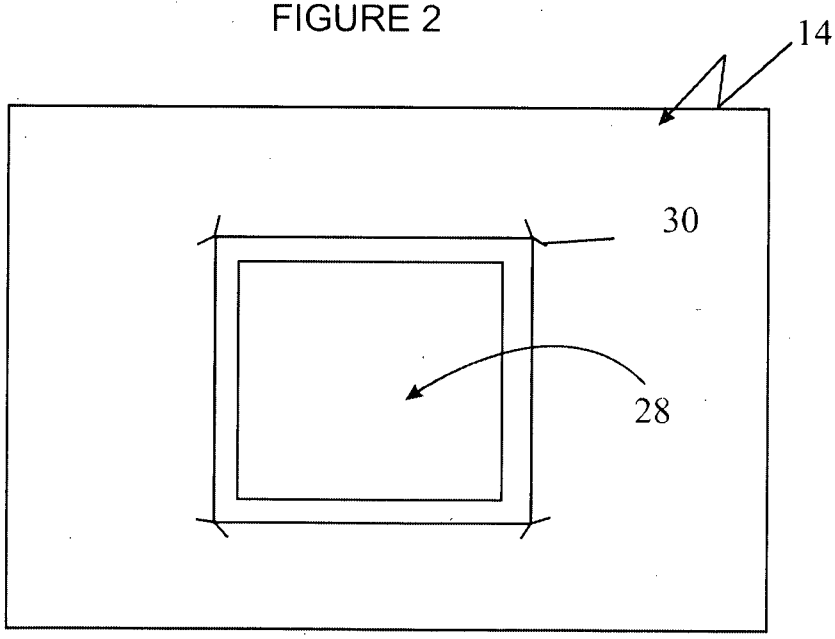


FIGURE 3

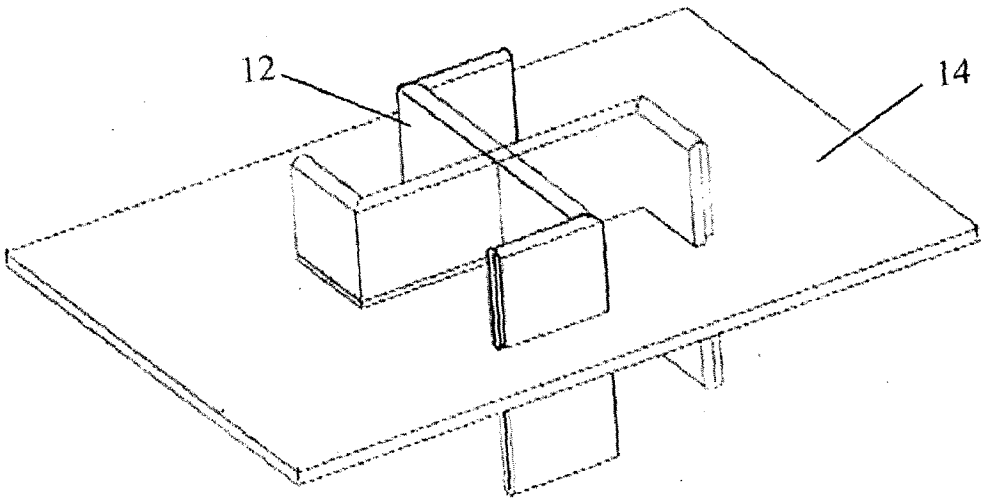


FIGURE 4

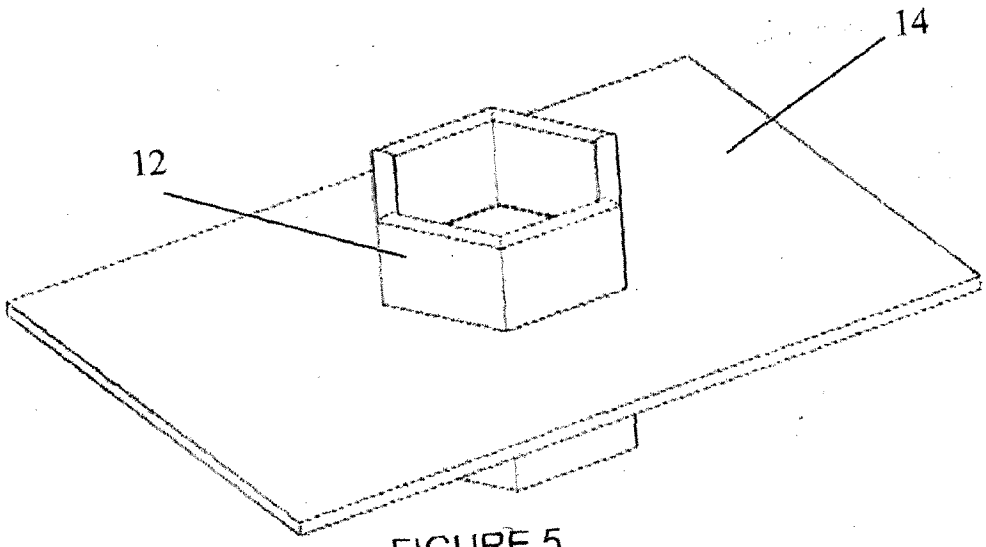
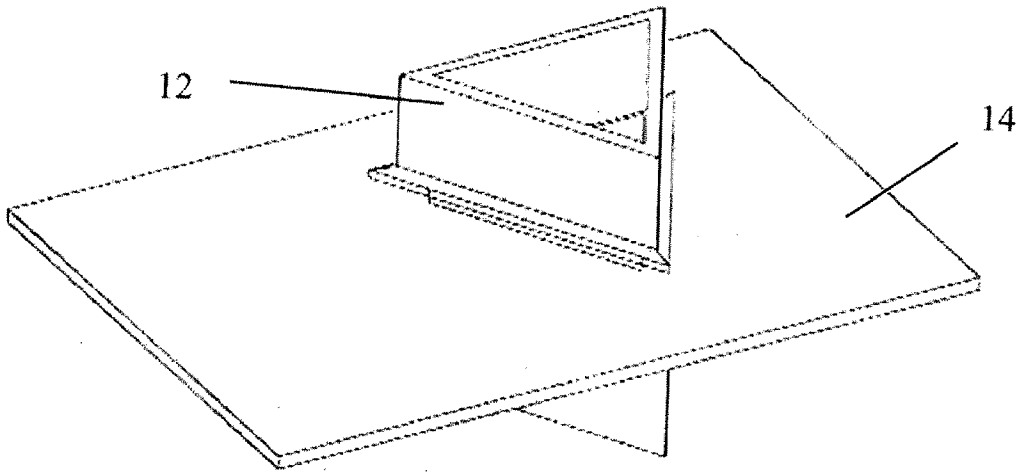


FIGURE 5



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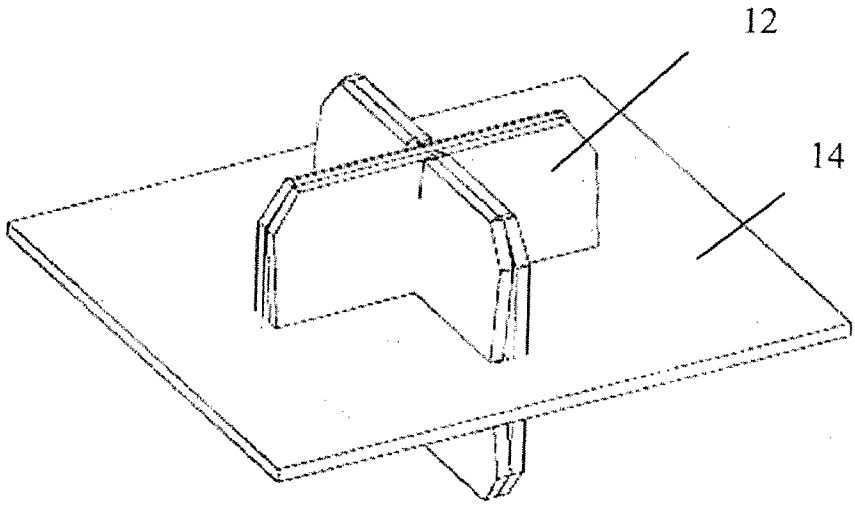


FIGURE 7

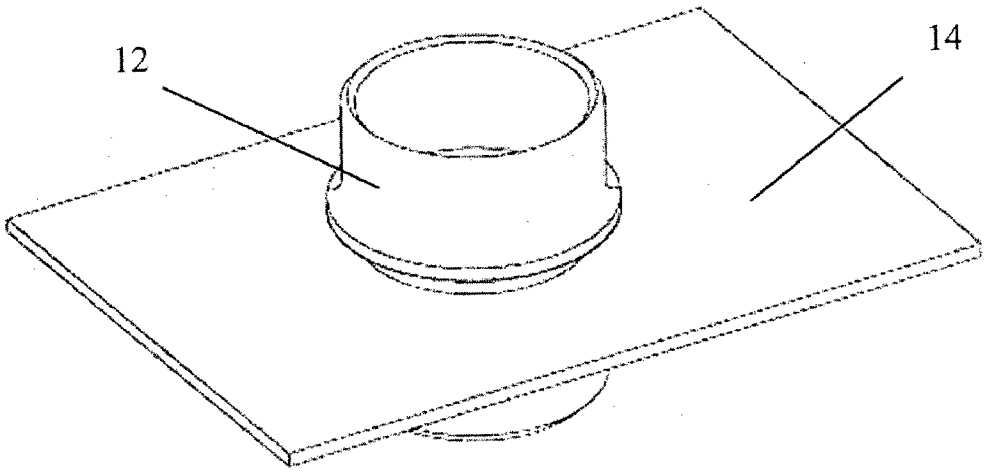


FIGURE 8

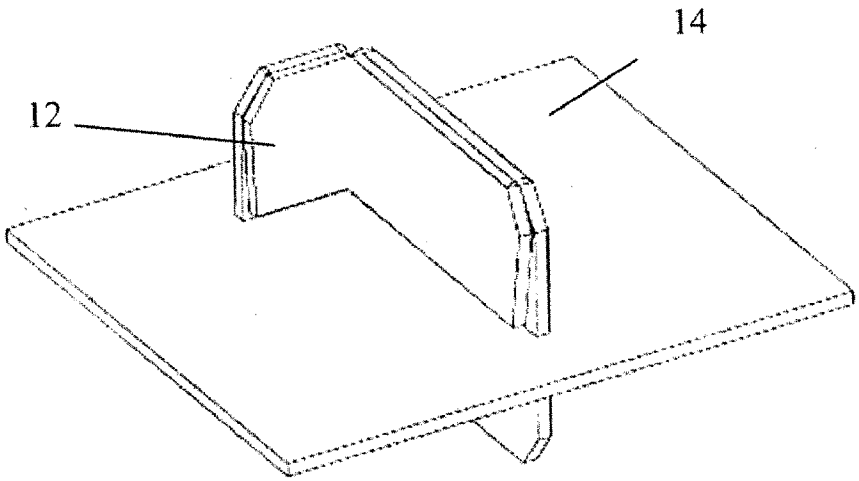


FIGURE 9

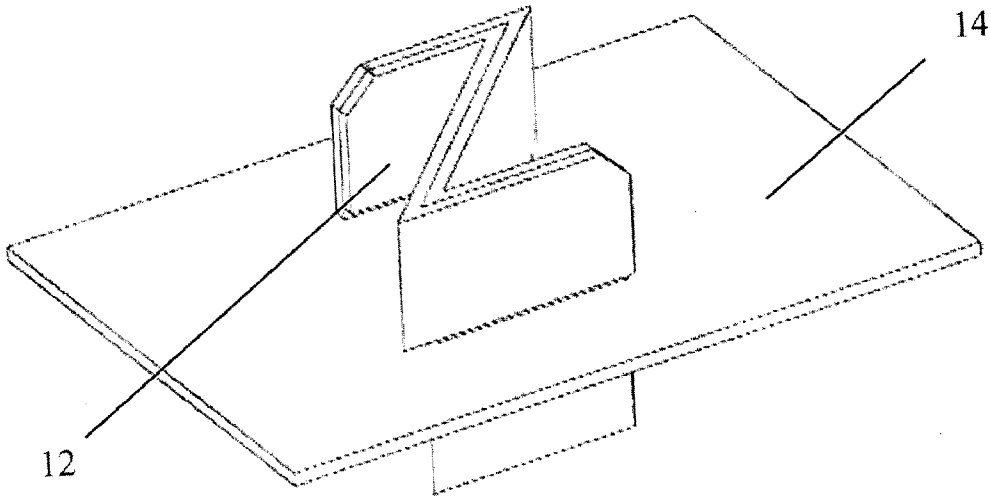
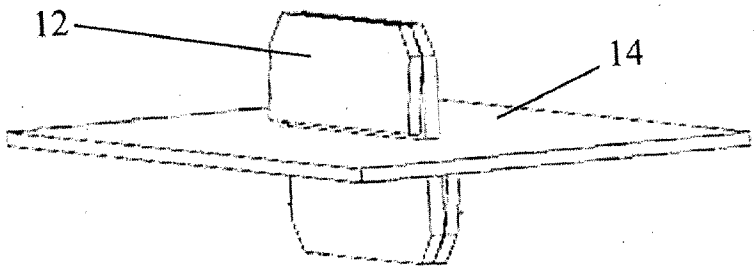


FIGURE 10



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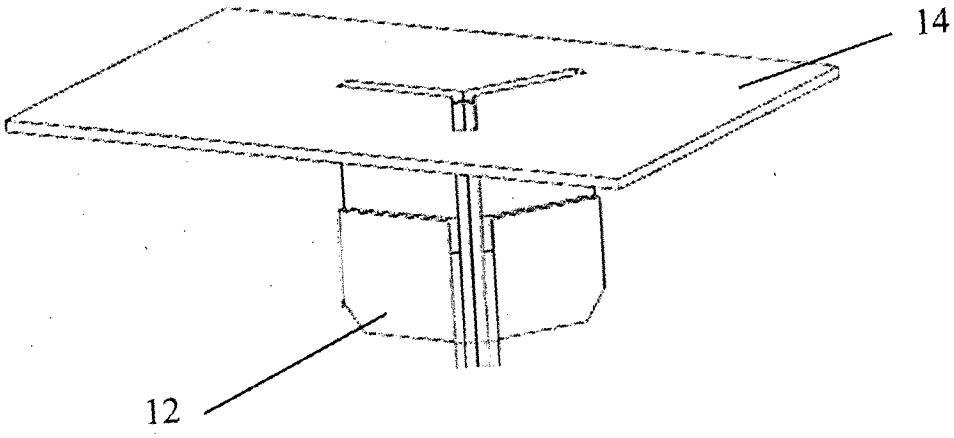

FIGURE 12

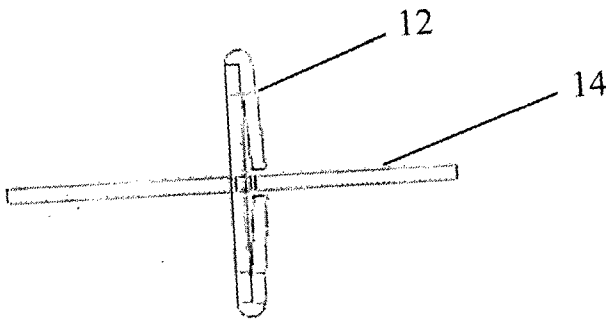

FIGURE 13

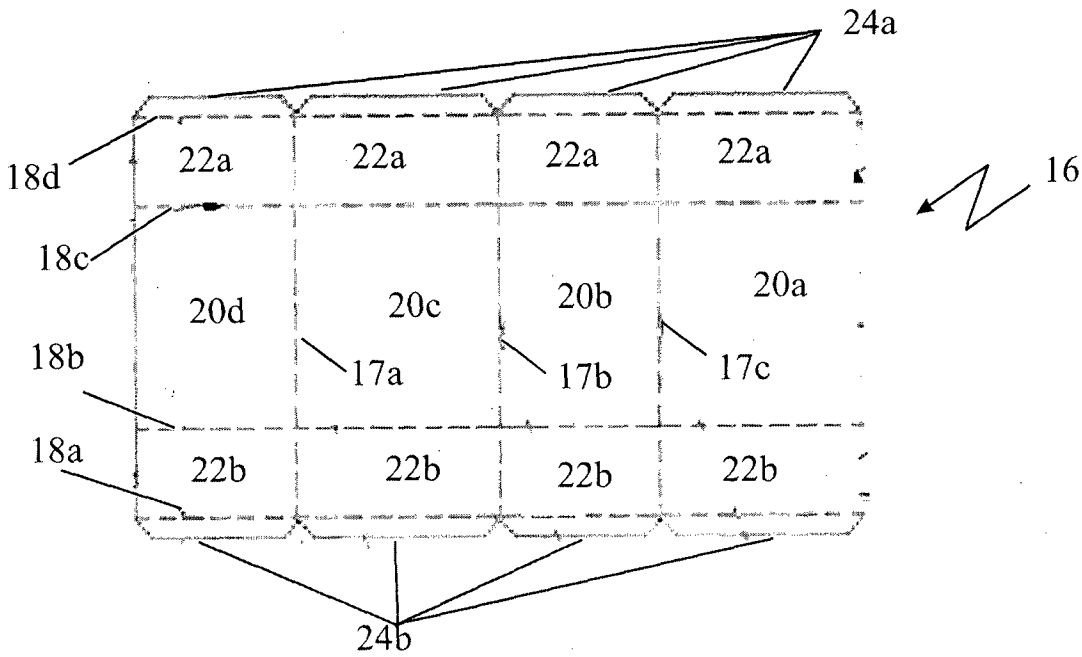

FIGURE 14

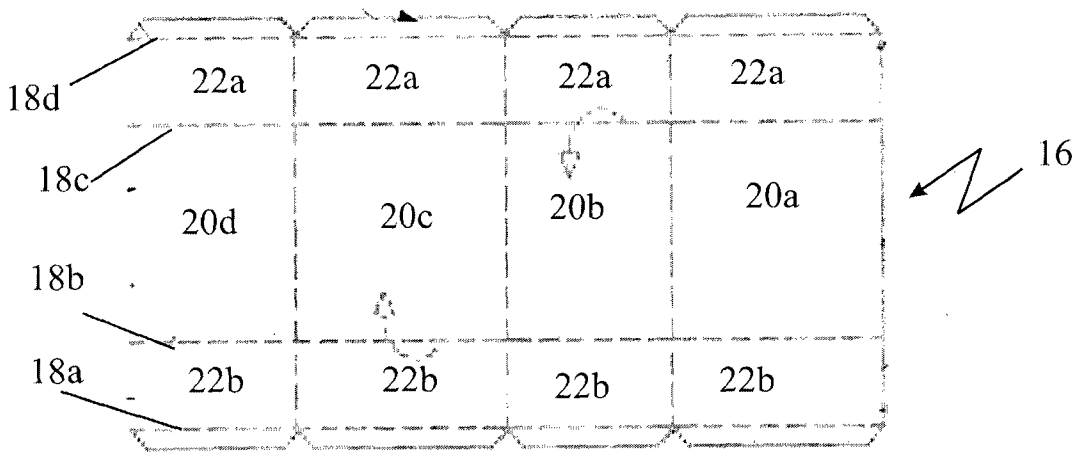

FIGURE 15

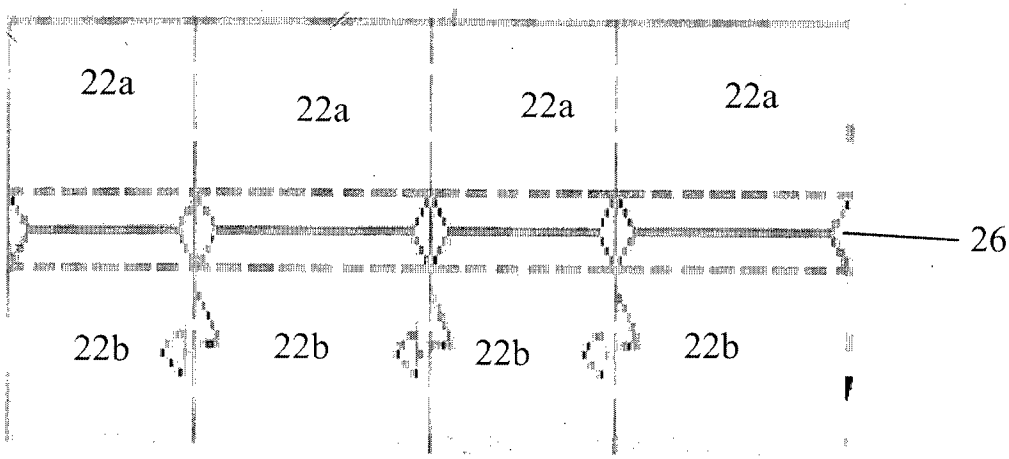

FIGURE 16

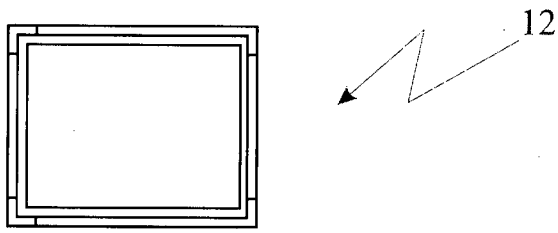

FIGURE 17

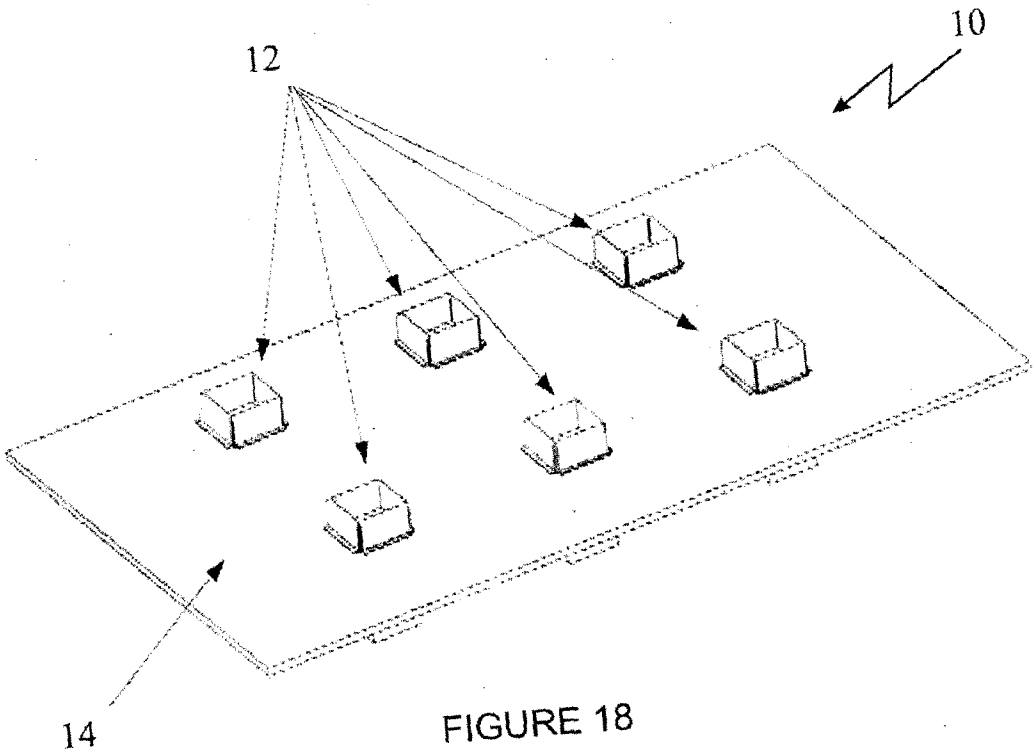

FIGURE 18

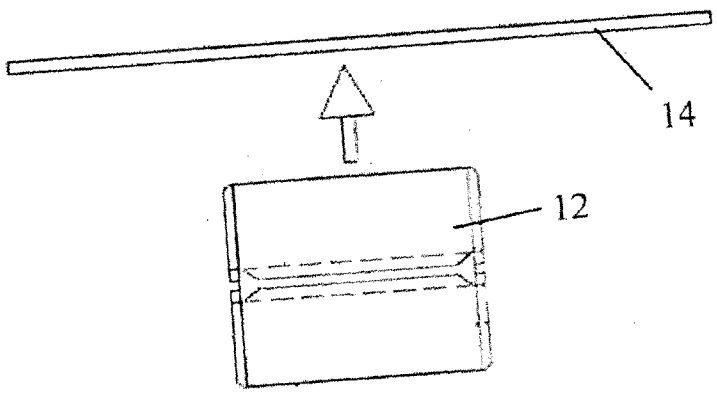

FIGURE 19

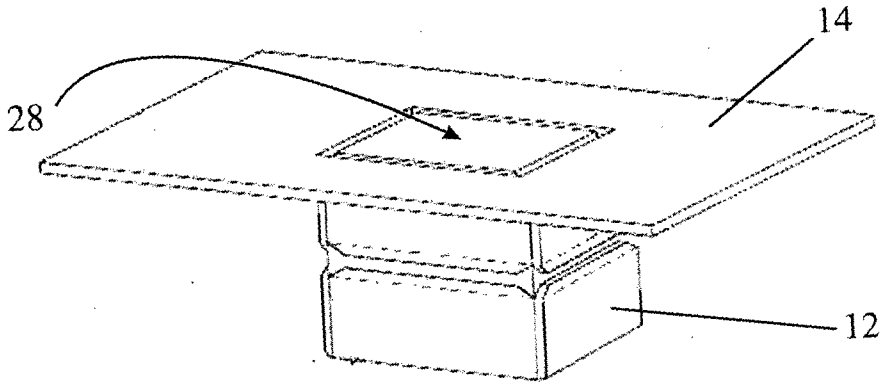

FIGURE 20

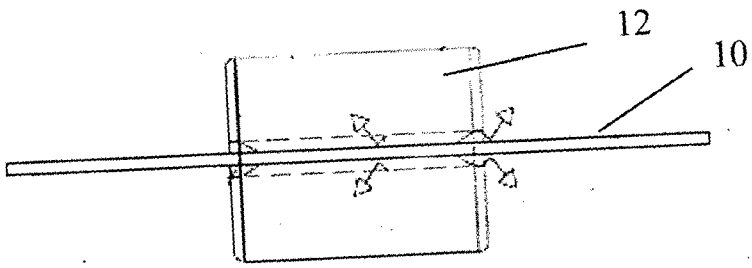

FIGURE 21

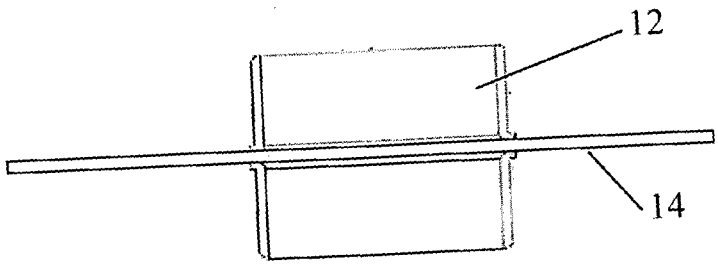

FIGURE 22