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(54) **MODULE CARD AND A METHOD FOR MANUFACTURING THE SAME**

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(52) **U.S. Cl.** **235/492**; 361/799

(58) **Field of Search** 235/492; 361/799

(56) **References Cited**

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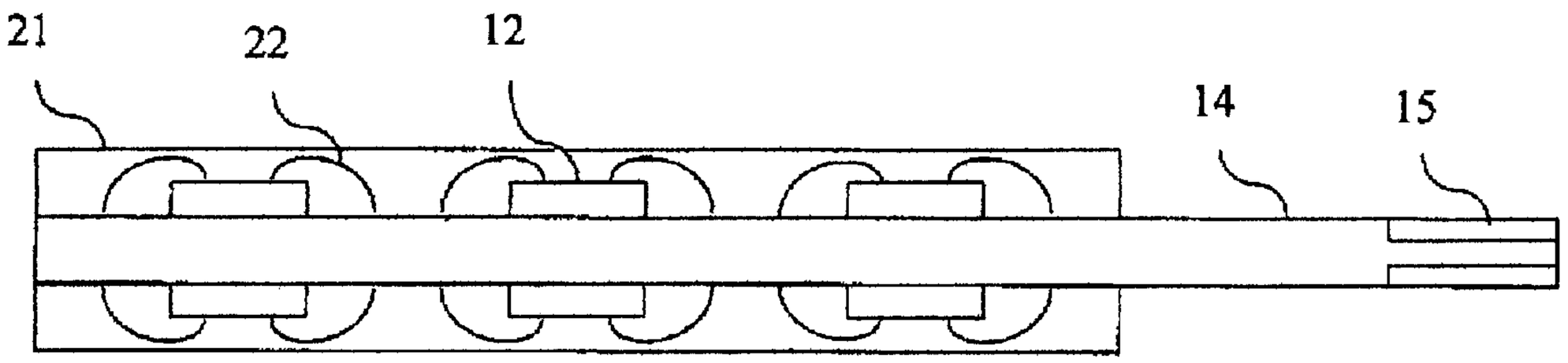
* cited by examiner

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(57) **ABSTRACT**

A manufacturing method of a module card comprises steps of: providing a base board having a golden finger; mounting a chip on the base board for electrically connecting to the golden finger; and forming a packing layer on the chip for forming the module card. A module card comprises: a base board; a chip mounting on a surface of the base board; a golden finger on the board and electrically connecting to the chip; and a packing layer forming on the chip for covering the chip.

10 Claims, 3 Drawing Sheets



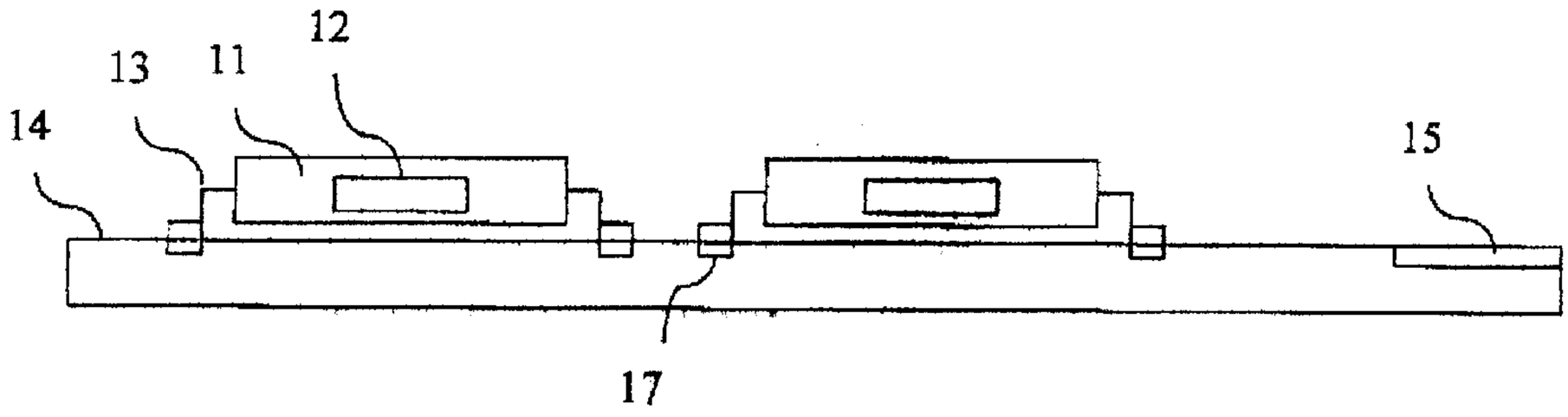


FIG. 1 (Prior Art)

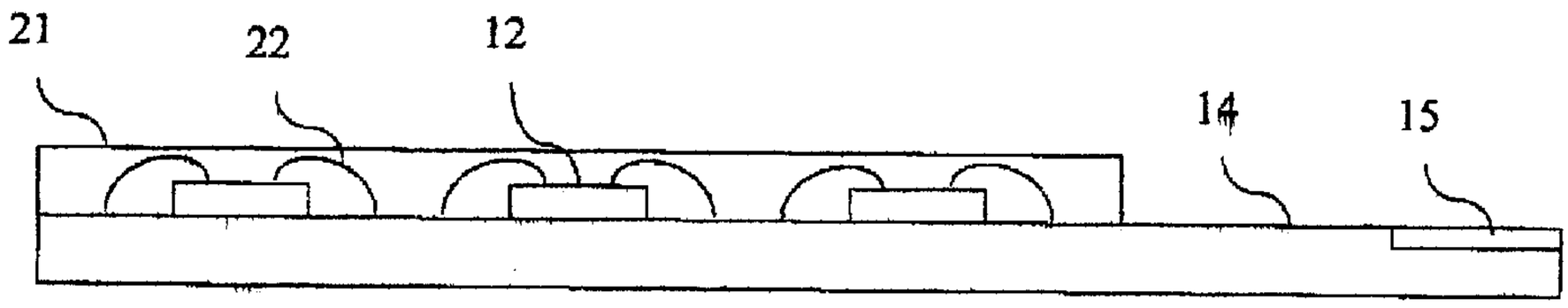


FIG. 2

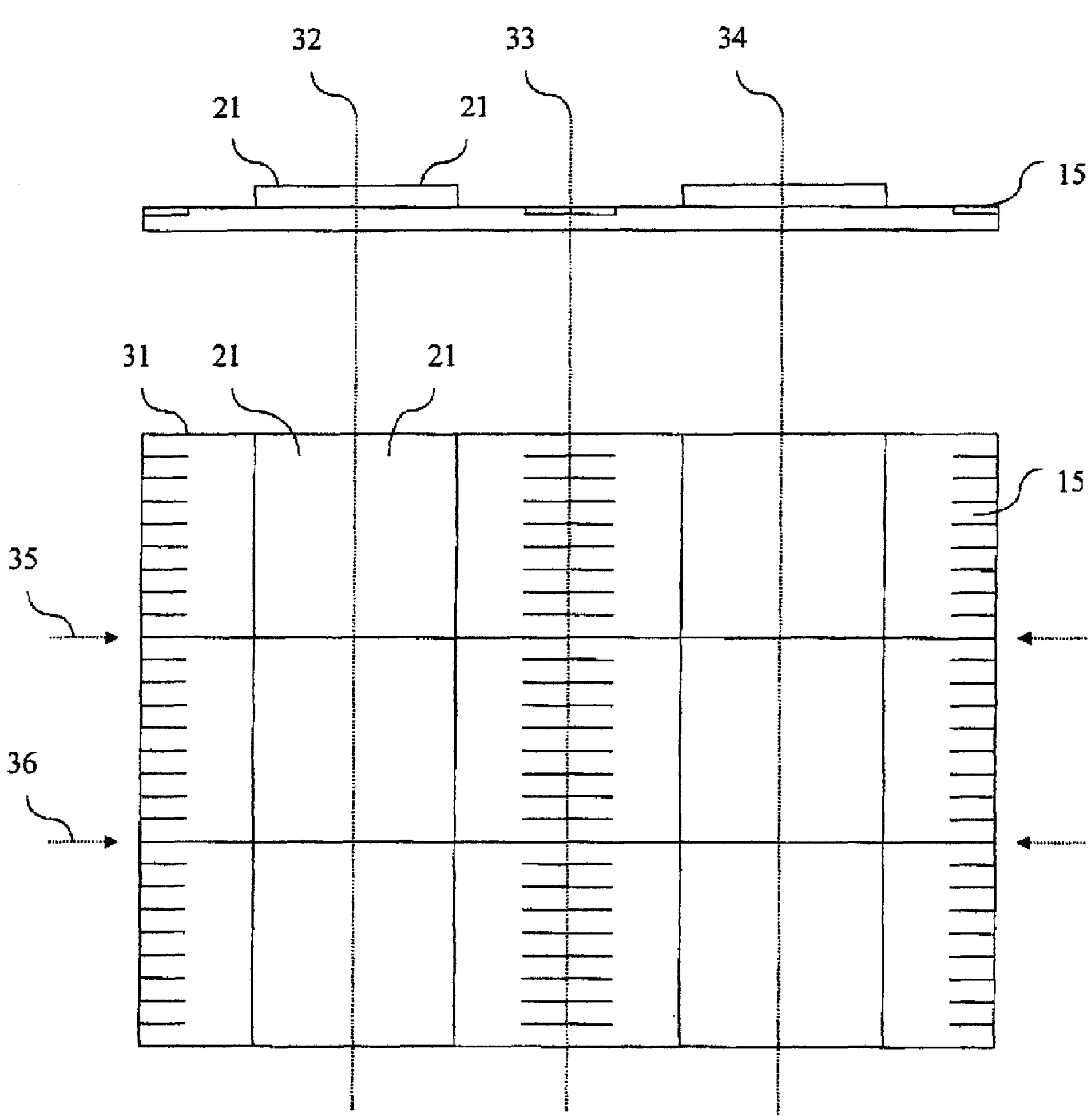


FIG. 3

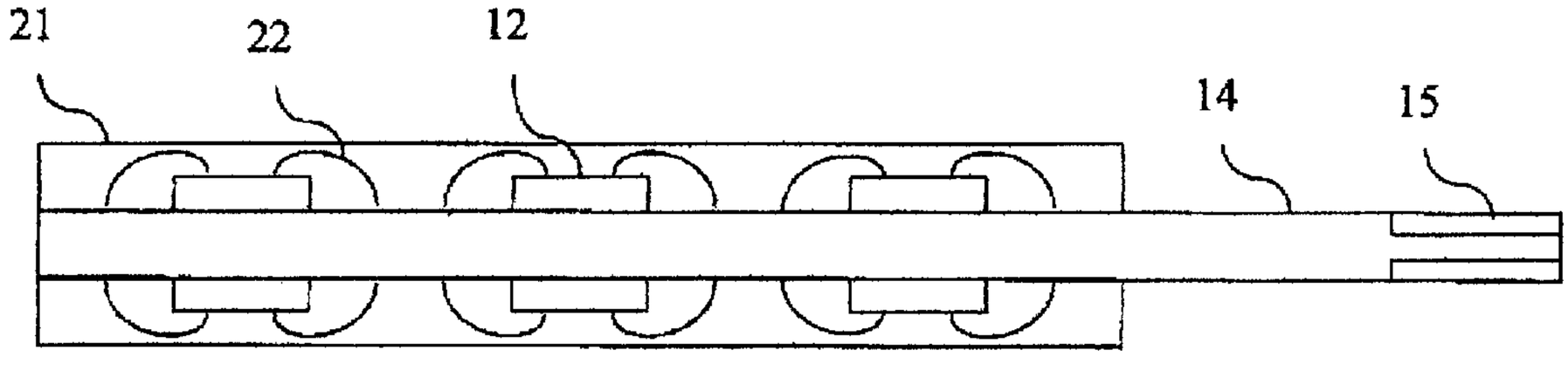


FIG. 4

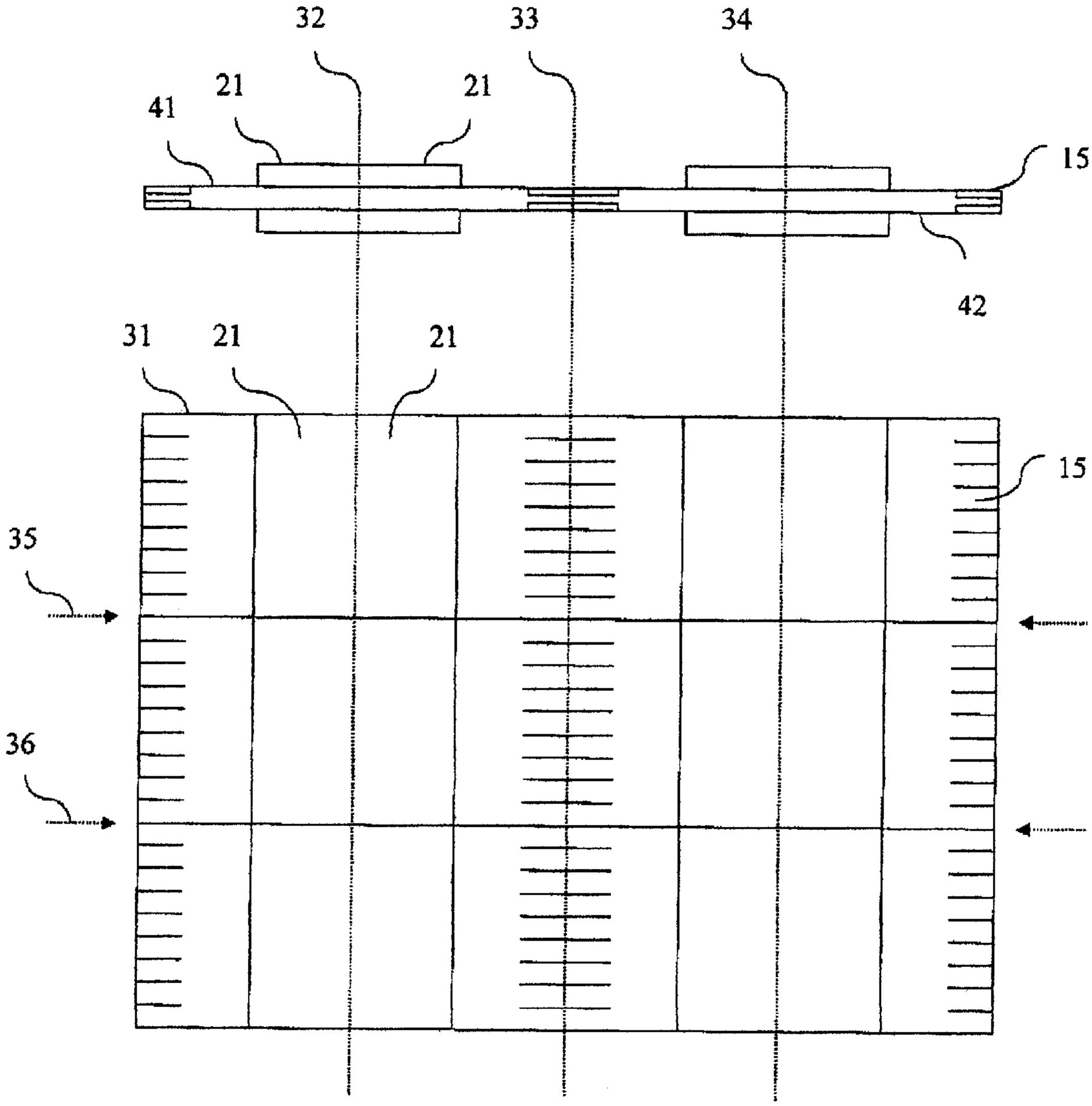


FIG. 5

MODULE CARD AND A METHOD FOR MANUFACTURING THE SAME

FIELD OF THE INVENTION

The present invention is related to a module card and it's manufacturing method, and specially to the module card of a printed circuit board (PCB) having golden fingers and the manufacturing method.

BACKGROUND OF THE INVENTION

The utility of a module card is very general. It may be used as an electronic part or a peripheral device in the computer, communication and consumer electronic product domains.

The prior method for manufacturing the module card always packs chips as integrated circuits (ICs), then mounts them onto a printed circuit board (PCB) as a module card by way of surface mount technique (SMT). The chip may be a memory element, such as an active element of the flash memory. There are golden fingers on the module card for inserting into a slot of a computer main-board. Certainly, some inactive elements such as resistance, capacitor and inductor are mounted on the module card.

Please refer to FIG. **1** showing the cleaved view of a prior module card. The Golden fingers **15** is used to insert into a slot of a computer main-board. There are active elements are inactive elements mounted on the module card. The active elements usually are packed as an integrated circuit **11** (IC). Each IC **11** includes a chip **12**. The chip **12** may be a memory chip, for example a flash memory chip. The pins **13** of ICs **11** are mounted onto the printed circuit board **14** (PCB) as the module card SMT. There are solder points **17** on the PCB **14** so that the pins of ICs **11** may be mounted onto. The prior arts has the following disadvantages:

1. A chip must be packed as an IC before the IC is mounted onto the PCB, so more steps are needed and the cost in manufacturing and packing will be increased.
2. A module card always includes many ICs so that the ICs must be mounted on the PCB one by one during manufacturing the module card.
3. The cost of SMT is expensive. Special manufacture devices such as a SMT machine and a solder furnace are needed.
4. The module card is manufactured separately so that the throughput is low.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an module card using the chip-on-board technique to mount chips on a PCB firstly before packing the chips and the PCB for reducing the step of SMT.

Another object of the present invention is to provide the manufacturing method of the module card to reduce the cost.

Another object of the present invention is to provide the manufacturing method of the module card to increase the throughput.

According to the present invention, a manufacturing method of a module card comprises steps of: providing a base board having a golden finger; mounting a chip on the base board for electrically connecting to the golden finger; and forming a packing layer on the chip for forming the module card.

In accordance with one aspect of the present invention, the base board includes a first surface and a second surface for mounting a plurality of the chips on the first surface and the second surface.

In accordance with one aspect of the present invention, the base board includes a plurality of package areas for packing a plurality of the module cards once.

In accordance with one aspect of the present invention, the packing layer includes a material of epoxy mold compound.

In accordance with one aspect of the present invention, the base board is a circuit board, and the circuit board is a printed circuit board.

According to the present invention, a module card comprises: a base board; a chip mounting on a surface of the base board; a golden finger on the board and electrically connecting to the chip; and a packing layer forming on the chip for covering the chip.

In accordance with one aspect of the present invention, the packing layer includes a material of epoxy mold compound.

In accordance with one aspect of the present invention, the surface of the base board includes a first surface and a second surface for packing a plurality of the chips.

In accordance with one aspect of the present invention, the module card is double sided.

In accordance with one aspect of the present invention, the base board is a circuit board, and the circuit board is a printed circuit board.

The present invention may best be understood through the following description with reference to the accompanying drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a module card cleaved diagram according to the prior arts;

FIG. **2** is a module card cleaved diagram according to the present invention;

FIG. **3** is the method for manufacturing a module card according to the present invention;

FIG. **4** is a double sided module card cleaved diagram according to the present invention; and

FIG. **5** is the method for manufacturing a double sided module card according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. **2** shows the cleaved structure of a module card according the present invention. It is different to the prior arts that chips **12** are directly mounted onto the PCB **14** by way of chip-on-board technique. Each chip has bond pads for wire bonding so that the metal wires **12** can be connected onto the PCB **14** before forming the packing layer (on packing area **21**) on the chips. The packing layer includes the material of epoxy mold compound. After packing layer is formed, the module card is completed. The steps is simplified. The SMT step is reduced so the speed of manufacturing the module card will be improved, and simultaneously the cost will be reduced.

FIG. **3** shows the steps of manufacturing a batch of module cards. There are twelve packing areas. Each packing area can be packed a module card. The upper part of the figure is a side view and the lower part is a top view. The packing area are symmetrical each other. The six packing

areas **21** on left side are connected together, and the six packing areas **21** on right side are also connected together, so the twelve packing areas **12** can be manufactured simultaneously. When the packing layer is covered on the packing areas **12** completely, cutting from the symmetrical lines **32**, **34**, **35**, **36**, the twelve module cards will be formed.

FIG. **4** shows the double sided module card cleaved diagram according to the present invention. It is different to FIG. **2** that the chips **12** are mounted onto the first surface **41** and the second surface **42** of the PCB **14**. This will improve the utility of the PCB **14**, so as to improve the packing density.

FIG. **5** shows the method for manufacturing a double sided module card according to the present invention. The same as FIG. **3**, there are twelve packing areas **12** on the base board. After the packing layer are formed on the packing areas **12** completely, the twelve module cards may be cutted down from the symmetrical lines **32**, **34**, **35**, **36**.

According to the present invention, the manufacturing method of a module card comprise steps of: providing a base board having a golden finger; mounting a chip on the base board for electrically connecting to the golden finger; and forming a packing layer on the chip for forming the module card. The following steps are mentioned in detail:

(1) Firstly, a PCB **31** is provided. The PCB **31** have two packing areas **21** at least, and the packing areas **21** are symmetrical each other. Each module card has the golden fingers **15**.

(2) Secondly, the chips **12** (referring to FIG. **2**) are mounted onto the packing areas **21**.

(3) The packing layer is formed on the packing areas **21** and the chips **12**. At least, two module cards can be produced after cutting the symmetrical lines.

The symmetrical lines may be between two packing areas **21** or two golden fingers **15** area. The packing layer includes the material of epoxy mold compound. For increasing the packing density, the double-sided process as FIG. **4** and FIG. **5** is recommended.

According to the present invention, the following advantages are issued:

1. The chips are mounted directly onto the PCB of the module card, so the SMT step is reduced, and the cost is easy to down.
2. The way of batch manufacture improves the throughput specially on the process of the packing layer and golden fingers.
3. The double-sided packing technique improves the packing density and the utility of the PCB.

While the invention has been described in terms of what are presently considered to be the most practical and preferred embodiments, it is to be understood that the invention need not be limited to the disclosed embodiment. On the contrary, it is intended to cover various modifications and similar arrangements included within the spirit and scope of the appended claims which are to be accorded with the broadest interpretation so as to encompass all such modifications and similar structures.

What is claimed is:

1. A manufacturing method of a module card comprising steps of:

providing a base board having a golden finger;

mounting a chip on said base board for electrically connecting to said golden finger; and

forming a packing layer on said chip for forming said module card.

2. A manufacturing method according to claim **1** wherein said base board includes a first surface and a second surface for mounting a plurality of said chips on said first surface and said second surface.

3. A manufacturing method according to claim **1** wherein said base board includes a plurality of package areas for packing a plurality of said module cards once.

4. A manufacturing method according to claim **1** wherein said packing layer includes a material of epoxy mold compound.

5. A manufacturing method according to claim **1** wherein said base board is a circuit board, and said circuit board is a printed circuit board.

6. A module card comprising:

a base board;

a chip mounting on a surface of said base board;

a golden finger on said board and electrically connecting to said chip; and

a packing layer forming on said chip for covering said chip.

7. A module card according to claim **6** wherein said packing layer includes a material of epoxy mold compound.

8. A module card according to claim **6** wherein said surface of said base board includes a first surface and a second surface for packing a plurality of said chips.

9. A module card according to claim **6** wherein said module card is double sided.

10. A module card according to claim **6** wherein said base board is a circuit board, and said circuit board is a printed circuit board.

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