

-1-

DOUBLE-SIDED COPPER-COATED PRINTED WIRING BOARD

BACKGROUND OF THE INVENTIONField of the invention

5 The present invention relates to a double-sided copper-coated printed wiring board for mounting components thereupon, more particularly to a printed wiring board comprising a flexible printed board.

Description of the related arts

10 Flexible printed boards are widely used for integrating circuits within small spaces having complex shapes in small-scale equipment such as cameras and the like. A flexible printed board on both sides of which components can be mounted is used in order to increase the mount
15 density of the components. Sometimes, as shown in Fig. 4, in order to improve the mountability of components on the flexible printed board, a pair of printed boards 1A and 1B are glued together by means of an adhesive 2, through-hole plating 3 and a cover-lay 4 are provided, and a reinforcing
20 plate 5 comprising a glass epoxy plate or the like is partially added.

 When a reinforcing plate 5 is provided as above, the component mounting area on one side of the printed board decreases by the area of the portion to which the
25 reinforcing plate 5 has been provided. Consequently, the size of the printed board must be increased in order to increase the area thereof, which is inconvenient.

SUMMARY OF THE INVENTION

30 The present invention has been devised after consideration of the above points and aims to provide a flexible printed board for double-sided mounting, which can reliably provide a mount area equivalent to a copper-foil area.

35 In order to achieve the above objectives, the present invention comprises a double-sided copper-coated printed board, comprising a flexible printed board, on one side of

which is pasted a copper foil, and to the other side of which is joined a flexible printed board, which is identical to the flexible printed board, or a copper foil, with a prepreg material provided therebetween.

5 Furthermore, according to a second aspect of the present invention, the double-sided copper-coated printed board further comprises a portion thereof to which the prepreg material is not provided.

BRIEF DESCRIPTION OF THE DRAWINGS

10 In the drawings:

Fig. 1 is a cross-sectional view of a cross-sectional structure of an embodiment of the present invention;

Fig. 2 is a cross-sectional view of a cross-sectional structure of another embodiment of the present invention;

15 Fig. 3 is a cross-sectional view of a cross-sectional structure of yet another embodiment of the present invention; and

Fig. 4 is a cross-sectional view of a cross-sectional structure of a conventional double-sided printed board.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

20 Fig. 1 shows a cross-sectional structure of an embodiment of the present invention, in which a pair of flexible printed boards 10 and 20 having identical configurations are provided back-to-back on either side of a reinforcing material comprising a prepreg 30. For instance, the flexible printed board 10, shown in the upper portion of the diagram, comprises a sheet of polyimide material 11 coated with an adhesive 12, over which is pasted a copper foil 13. Similarly, the flexible printed board 20, shown in the lower portion of the diagram, comprises a sheet of polyimide material 21 coated with an adhesive 22, over which is pasted a copper foil 23.

25 Then, after joining together the flexible printed boards 10 and 20 by means of the prepreg 30, which is provided from the right end of the diagram to the central portion of the diagram, cover-lays 14 and 24 are provided over the copper foils 13 and 23 respectively. Furthermore,

the prepreg 30 is also provided in the portion indicated in the diagram by the phantom line. The prepreg 30 comprises imide resin or epoxy resin, and is sufficiently rigid to withstand the installation of components onto the printed board.

Therefore, in the double-sided copper-coated printed board as described above, the portions on the left and right of Fig. 1, including the portion indicated by the phantom line, are the portions within which components are installed, and the portion in the center of the diagram is the cable portion. The component installation portions are rigid in order to install components therein. The cable portion is flexible and capable of bending.

Fig. 2 shows a cross-sectional structure of another embodiment of the present invention. In this case, the component installation portions comprise a pair of flexible printed boards joined together by means of a prepreg 30 as above, but this embodiment differs from the embodiment in Fig. 1 in that, firstly, the cable portion comprises only one flexible printed board. Secondly, through-hole plating 40 is provided instead of cover-lays over the copper foils 13 and 23.

Fig. 3 shows yet another embodiment of the present invention. In this embodiment,

the double-sided copper-coated printed board comprises a single flexible printed board, on one side of which a single copper foil is provided, with a prepreg 30 therebetween. In other words, the flexible printed board shown in the upper portion of the diagram comprises a copper foil 13 which is pasted over a sheet of polyimide material 11, with no adhesive provided therebetween. Another copper foil 23 is provided on the other side of the flexible printed board, with the prepreg 30 provided therebetween. Through-hole plating 40 is then performed from copper foil 13 to copper foil 23 and components 50 are installed on this through-hole plating 40.

The layered structure of this embodiment is simpler

than the embodiments in Fig. 1 and Fig. 2, making this embodiment more cost-effective. Furthermore, this embodiment has a lower total thickness than the highly rigid embodiments of Fig. 1 and Fig. 2, and can therefore
5 be used as a suitable alternative to those embodiments.

As explained above, since the flexible printed board extends over the component installation portions and the cable portion, the flexible printed board must be used so that at least one of the copper foils provided thereon
10 functions as a cable portion, namely as a bending portion.

As described above, the double-sided copper-coated printed board of the present invention comprises a flexible printed board, which is joined to another flexible printed board, or to a copper foil, with a prepreg provided
15 therebetween. Therefore, there is no need to provide a reinforcing plate as in a conventional printed board. As a result, there is no reduction of installation area due to the provision of a reinforcing board. Components can therefore be mounted on the whole of the double-sided
20 copper-coated printed board.

While there have been described what are at present considered to be preferred embodiments of the invention, it will be understood that various modifications may be made thereto, and it is intended that the appended claims
25 cover all such modifications as fall within the true spirit and scope of the invention.



WHAT IS CLAIMED IS:

1. A double-sided copper-coated printed board comprising a flexible printed board, on one side of which is pasted a copper foil, and to an opposing side of which is joined another flexible printed board which is identical to the flexible printed board, or a copper foil, a prepreg material being provided therebetween.
2. A double-sided copper-coated printed board according to Claim 1, wherein the printed board comprises a portion to which the prepreg material is not provided.

This Sheet Has Been Replaced



THIS SHEET HAS BEEN
REPLACED

DOUBLE-SIDED COPPER-COATED PRINTED WIRING BOARD

ABSTRACT OF THE DISCLOSURE

5 A flexible printed board, which reliably ensures a mounting area equivalent to the area of a copper foil, is provided. A double-sided copper-coated printed board comprises a copper foil (13) which is pasted over one side of a flexible printed board (10), and another flexible printed board (20) which is identical to the flexible printed board (10), or a copper foil (23), which is joined
10 to the opposite side of the flexible printed board (10) with a prepreg (30) provided therebetween.

(Figure 1)

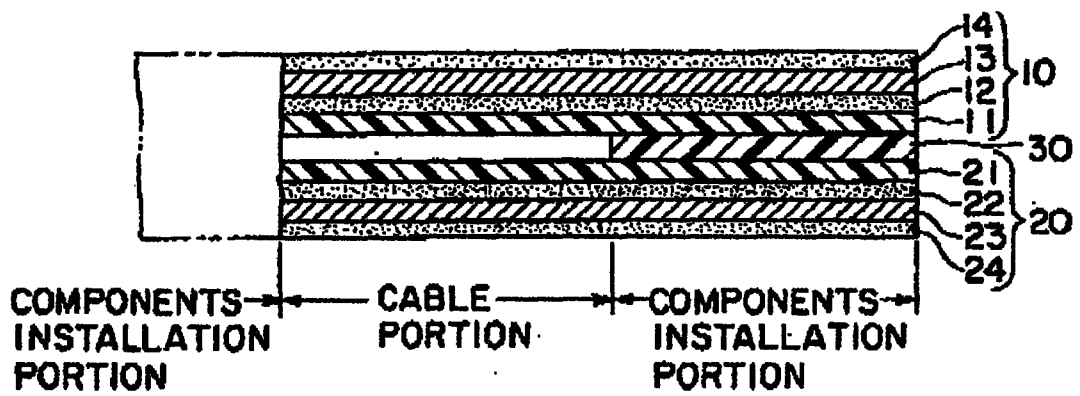


FIG. 1

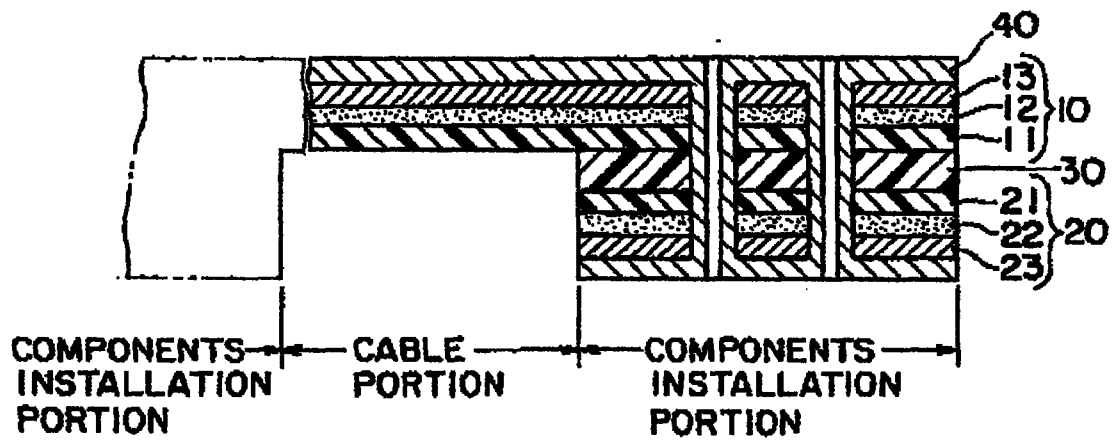


FIG. 2

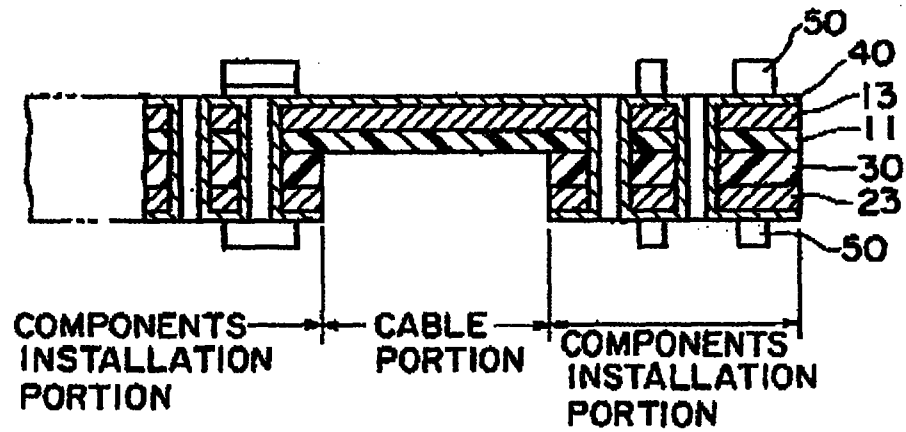


FIG. 3

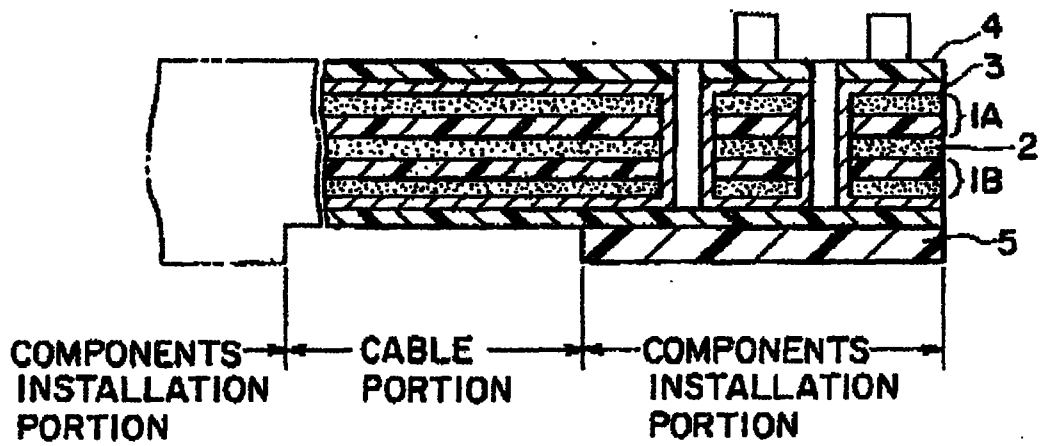


FIG. 4

- 5 -



WHAT IS CLAIMED IS:

1. A double-sided copper printed board comprising a cable portion and a components installation portion, said cable portion being a flexible printed board, and said components installation portion being a slightly flexible and sufficiently rigid printed board which withstands the installation of components, on one side of said flexible printed board is pasted a copper foil, and to an opposing side of the same is joined another flexible printed board which is identical to said flexible printed board, or a prepreg material being provided therebetween.
2. A double-sided copper-coated printed board according to claim 1, wherein the printed board comprises a portion to which the prepreg material is not provided.

REPLACEMENT SHEET

26 JUL 1999

AMENDED SHEET