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Single piece carrier for integrated circuit devices

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Fig. 1

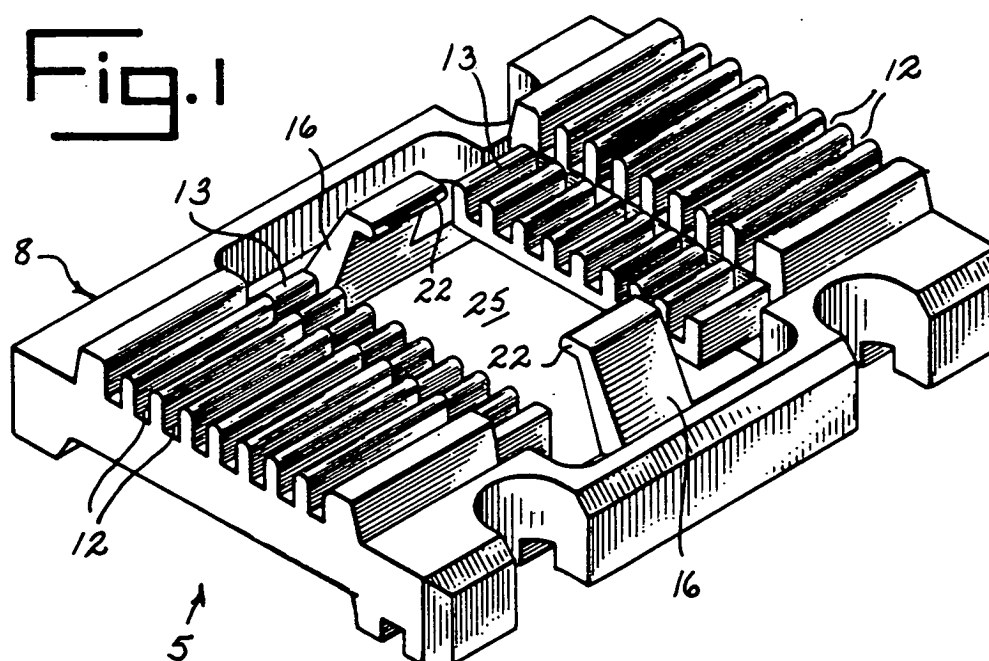


Fig. 2

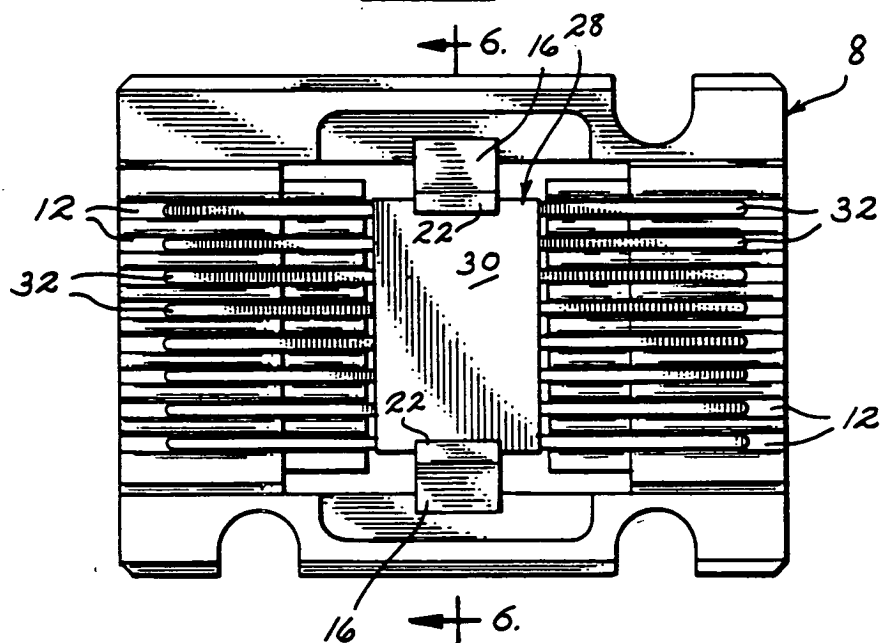


Fig. 3

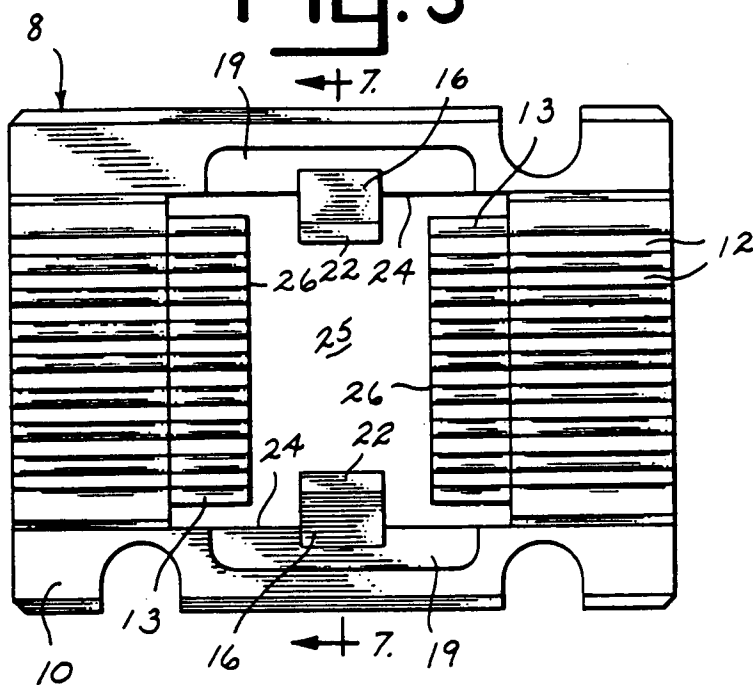


Fig. 4

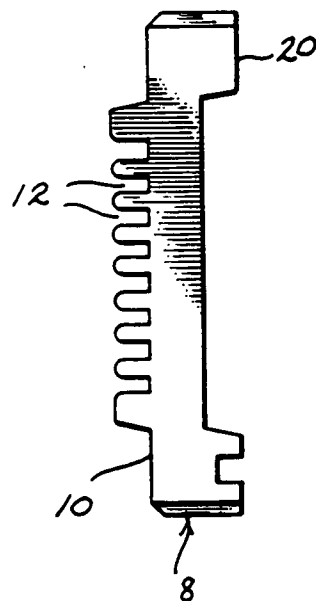


Fig. 5

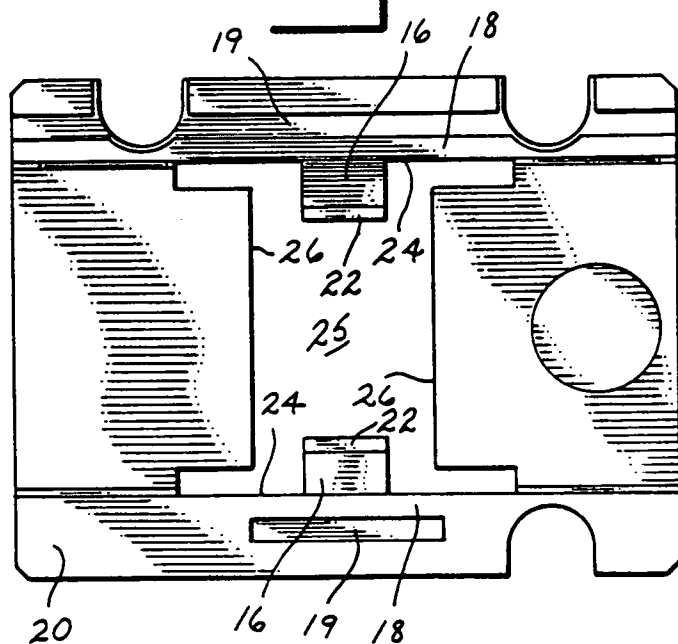


Fig. 6

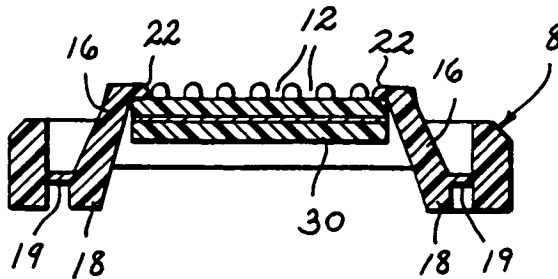


Fig. 7

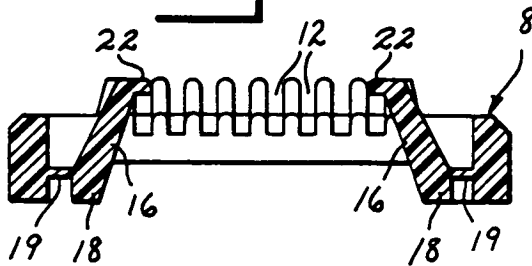


Fig. 8

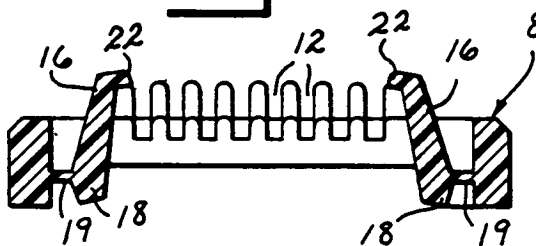


Fig. 9

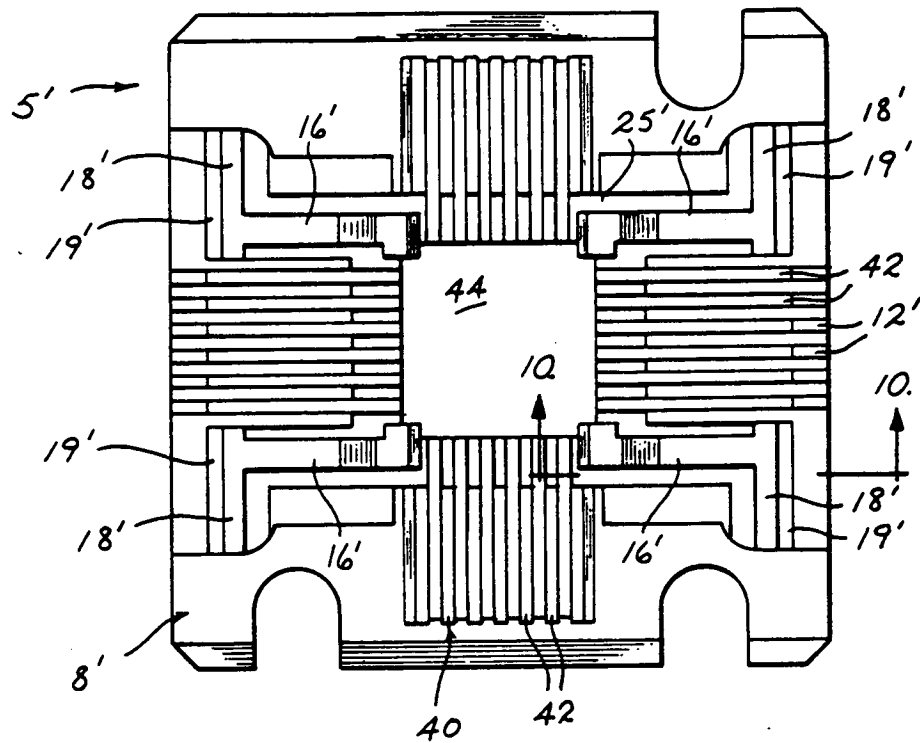
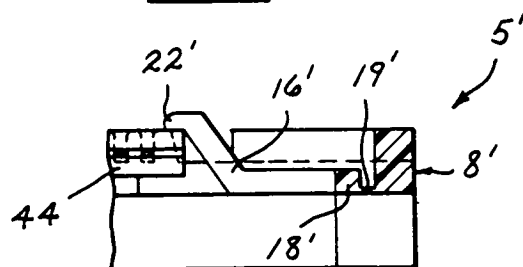


Fig. 10



SINGLE PIECE CARRIER FOR INTEGRATED CIRCUIT DEVICES

This invention relates to a single piece carrier for an integrated circuit device.

In one aspect the present invention provides a single piece carrier for use with an integrated circuit device; said carrier having frame means defining an opening for receiving the body of the device opposed marginal tabs for movement between a closed position and an open position with respect to the frame means and torsional bars supporting the tabs and constituting by their axial twisting the sole means for accommodating such tab movement, the movement of the tabs from a closed integrated circuit device clamping position to an open outwardly flexed position free of said integrated circuit device relative to the frame means effecting said axial twisting of the bars longitudinally relative to the frame means.

The invention also provides a single piece carrier for an integrated circuit device of the type having a body with leads extending therefrom; said carrier comprising a frame having upper and lower faces, said frame having an opening extending from said upper face to said lower face and said upper face including spaced grooves, said frame opening serving to receive the body of said device and said frame grooves serving to receive the leads of said device, at least two spaced apart arms adjacent said opening, the lower end of each arm being connected to bar

means extending between spaced sections of said frame adjacent the periphery of said frame opening, each bar means being axially twistable about its longitudinal dimension for accommodating movement of its connected arm
5 between an open position, wherein the leads of said device can be located within said frame grooves, and a closed position wherein said device can be engaged by said connected arm to secure the device with its leads in said frame grooves to the carrier, the axial twisting of each
10 bar means serving as the sole means for controlling the movement of its connected arm between the open and closed positions and each bar means being biased to urge its connected arm into its said closed position.

In a preferred construction, the carrier is designed
15 with opposed shaped arms or tabs which extend upwardly from either side of a rectangular opening formed within the carrier. Each tab is connected at its lower end to an integral twistable bar part which deforms to allow the connected tab to be moved between open and closed
20 positions. When the tabs are in their open positions, the integrated circuit device can be fitted into the carrier. When in their closed positions, the tabs engage and overlie the integrated circuit device, serving to hold it snugly in place. The carrier accepts formed lead
25 integrated circuit devices right side up, as well as those integrated circuit devices having narrowly spaced leads. Also, due to the large centre opening in the carrier, the circuit device may be marked on either its top or bottom.

A carrier constructed in accordance with the invention is of simple and reliable construction and operation, is

easily adapted for automated loading and unloading and moreover is easily adapted to house several types of flatpack integrated circuit devices.

The invention may be understood more readily, and various other features of the invention may become apparent, from consideration of the following description.

Embodiments of the invention will now be described by way of examples only, with reference to the accompanying drawings wherein:

10 Fig. 1 is a perspective view of the one embodiment of a carrier constructed in accordance with the invention;

 Fig. 2 is a top plan view of the carrier of Fig. 1 with an integrated circuit device secured
15 therein;

 Fig. 3 is a top plan view of the carrier of Fig. 1;
 Fig. 4 is an end elevational view of the carrier of Fig. 1;

 Fig. 5 is a bottom view of the carrier of Fig. 1;
20 Fig. 6 is a sectional view taken along line 6-6 of Fig. 2;

 Fig. 7 is a sectional view taken along line 7-7 of Fig. 3;

 Fig. 8 is a sectional view like Fig. 7 but showing the tabs flexed into open positions;
25

 Fig. 9 is a top plan view of a second embodiment of

a carrier constructed in accordance with the invention; and

Fig. 10 is a fragmentary sectional view taken along line 10-10 of Fig. 9.

5 The preferred embodiments illustrated are not intended to be exhaustive or to limit the invention to the precise forms disclosed. They are chosen and described in order to best explain the principles of the invention and its application and practical use to thereby enable others
10 skilled in the art to best utilise the invention.

 The carrier 5 shown in Figs. 1-8 includes a frame 8 having an upper face 10 and a lower face 20. A centre opening 25 is formed by frame 8 extending from upper face 10 to lower face 20. Opening 25 is defined by ends 24
15 and sides 26 and is sized to receive body 30 of an integrated circuit device 28. Spaced longitudinal grooves 12 are formed in frame face 10 and extend in opposite directions from sides 26 of opening 25 to accept extending leads 32 of integrated circuit device 28. An offset groove section
20 13 may be formed next to each side 26 to accommodate the leads of a formed lead device (not shown).

 A bar part 18 is located at each end 24 of opening 25 and extends between opening sides 26. An arm or tab 16 is connected at one end to each bar part 18 at its longitudinal
25 centre. Each tab 16 extends upwardly and generally inwardly,

terminating in a lip 22. Each bar part 18 is rotatable about its longitudinal dimension in the manner of a torsion bar to accommodate movement of its connected tab 16 between a closed position, as seen in Figs. 6 and 7, and an open outwardly flexed position, as shown in Fig. 8, to receive body 30 of device 28. A web 19 is shown extending between each bar part 18 and the frame to provide optional positioning support for the bar part.

Device 28 is secured within carrier frame 8 with the lips 22 engaging the body 30 of the device as the tabs 16 are returned to their closed positions from their flexed open positions due to the torsional biasing of bars part 18. The device may be released from carrier 5 by merely flexing the tabs 16 outwardly with the resulting rotation of bars part 18.

A second embodiment of the invention is illustrated in Figs. 9 and 10, showing a carrier 5' accommodating a quadpack type of integrated circuit device 40. Tabs 16' are located at each corner of frame opening 25'. Grooves 12' accept leads 42 which extend from each side of body 44 of the integrated circuit device 40. Each tab 16' is connected at its one end to a torsional bar part 18' and has a lip 22' formed at its opposite end. A web 19' extends between each bar part 18' and carrier 8'. The manner of operation of tabs 16' and their supporting bar parts 18' is similar to the operation of tabs 16 and bar parts 18

shown in Figs. 1-8.

It is to be understood the invention is not to be limited to the description above given but that it may be modified within the scope of the appended claims.

CLAIMS

1. A single piece carrier for an integrated circuit device of the type having a body with leads extending therefrom; said carrier comprising a frame having upper and lower faces, said frame having an opening extending
5 from said upper face to said lower face and said upper face including spaced grooves, said frame opening serving to receive the body of said device and said frame grooves serving to receive the leads of said device, at least two spaced apart arms adjacent said opening, the lower end of
10 each arm being connected to bar means extending between spaced sections of said frame adjacent the periphery of said frame opening, each bar means being axially twistable about its longitudinal dimension for accommodating movement of its connected arm between an open position,
15 wherein the leads of said device can be located within said frame grooves, and a closed position wherein said device can be engaged by said connected arm to secure the device with its leads in said frame grooves to the carrier, the axial twisting of each bar means serving as
20 the sole means for controlling the movement of its connected arm between the open and closed positions and each bar means being biased to urge its connected arm into its said closed position.
2. A carrier according to claim 1, wherein said frame
25 opening is defined by spaced sides and spaced ends, each bar means being located adjacent to one of said frame ends.

3. A carrier according to claim 2, and further comprising a web extending between each bar means and said frame at its said adjacent frame end.
4. A carrier according to claim 1, wherein said frame opening is defined by spaced sides and spaced ends joined at corners, each bar means being located adjacent one of said corners.
5. A carrier according to claim 4 and further comprising a web extending between each bar means and said frame at its said adjacent corner.
6. A single piece carrier for use with an integrated circuit device; said carrier having frame means defining an opening for receiving the body of the device, opposed marginal tabs for movement between a closed position and an open position with respect to the frame means and torsional bars supporting the tabs and constituting by their axial twisting the sole means for accommodating such tab movement, the movement of the tabs from a closed integrated circuit device clamping position to an open outwardly flexed position free of said integrated circuit device relative to the frame means effecting said axial twisting of the bars longitudinally relative to the frame means.
7. A carrier substantially as described with reference to, and as illustrated in, any one or more of the Figures of the accompanying drawings.
8. The combination of a carrier according to any one of the preceding claims and an integrated circuit device carried thereby.
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