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(54) Vertical mount connector

(57) An electrical connector (1') comprises: a conductive contact (6') connected to a circuit board mounting terminal (17'), an insulative body (3') surrounding the contact (6'), a conductive shell (2') surrounding the insulative body (3'), a conductive base (11') extending from the shell (2'), and conductive circuit board mounting posts (13') on the base (11'). An electrical capacitor comprised of a dielectric element (26') engages the base (11') and a conductive platform (31) having spring fingers (34) for engaging pads on a circuit board.

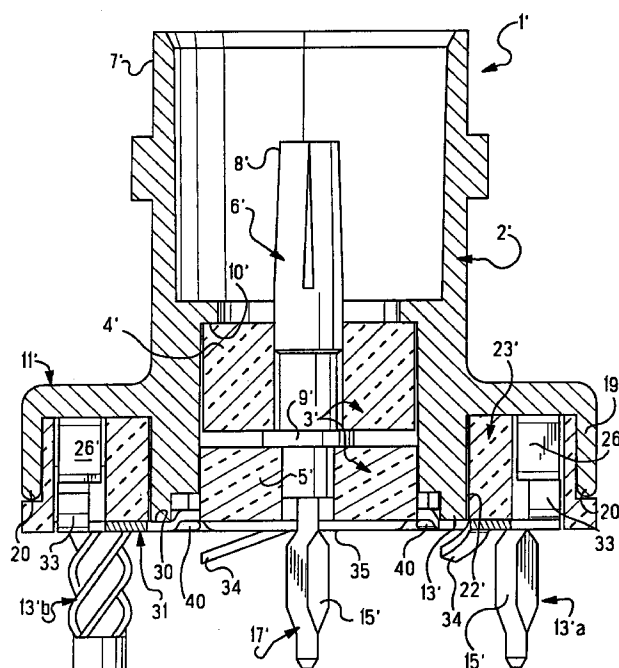


FIG. 1

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Description

The invention relates to a connector that is vertically mounted to a circuit board and incorporates an electrical filter.

A known connector described in US-A-4 684 200 comprises, a conductive shell surrounding an insulative body, a conductive contact surrounded by the insulative body, a mounting terminal on the contact, a base surrounding the shell, and mounting posts projecting from the base. A mating portion is for mated coupling with an electrical connector that is terminated to an electrical cable. The terminal and the mounting posts connect to a circuit board. The mounting posts connect the base of the connector to a conducting ground path of the circuit board. One of the drawbacks of the known connector is that radio frequency interference, RFI, can induce a voltage in a signal contact of the connector.

A connector described in US-A-5 062 811 comprises, a conductive shell, capacitor elements against the shell, and a conductive clip engaging the capacitor elements and extending to mounting posts projecting from a housing surrounding the shell. voltages induced by RFI are transmitted through the capacitor elements to a ground path of a circuit board to which the mounting posts are connected. It is desirable to shorten the conductive path between the capacitor elements and the ground path of the circuit board, thereby to reduce the electrical resistance in the circuit path, and to reduce the transmission time of the induced voltages to the circuit board.

The present invention consists in an electrical connector as defined in claim 1.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 is an elevational view in section of a connector comprising, a dielectric element, a shell and a base.

Figure 2 is a bottom plan view of a conductive platform of the connector shown in Figure 1;

Figure 3 is an elevational view of the platform;

Figure 4 is an exploded perspective view of the platform with an insulator; and

Figure 5 is a bottom plan view of the structure shown in Figure 4 mounted in the connector.

With reference to Figure 1, a coaxial electric connector 1' includes a hollow conductive shell 2' surrounding an insulative body 3', comprised of a first cylindrical portion 4' and a second cylindrical portion 5' surrounding a conductive electrical contact 6' concentric within the shell 2'. The axis of the connector 1' is the concentric axis of the shell 2' and the contact 6'. A top mating end 7' of the shell 2' provides a coupling for mated connection with another, complementary connector, not shown. An electrical receptacle portion 8' of the contact 6' is for mated connection with the complementary con-

ductor, not shown. The contact 6' has a radial flange 9' against which the portions 4', 5' of the insulative body 3' are seated. The shell 2' has an internal lip 10' against which the portion 4' seats to prevent movement of the insulative body 3' relative to the shell 2'. A corner edge of the shell 2' is indented inwardly radially at various points to provide protrusions 10'a (Fig 5) overlapping the portion 5' to prevent movement of the insulative body 3'.

A broad base 11', figure 5, surrounds a bottom 12' of the shell 2'. the base 11' is conductive and is a unitary part of the shell 2'. Conductive, circuit board mounting fasteners or posts 13'a extend beyond a mounting surface 14' of the base 11' are adapted with compliant portions 15' to be connected to a circuit board, not shown. The base 11 has a flange 19 with a rim 20. The posts 13'a are connected to the base 11'. Other fasteners 13'b mechanically mount the base 11' to the circuit board, not shown. A conductive circuit board mounting, electrical terminal 17' of the contact 6' has a compliant portion 15' and extends beyond the mounting surface 14' to be connected to a circuit board, not shown. further details of the connector' are described in US-A-4 684 200. With reference to Figures 1 and 5, the base 11' has a stepped interior passage 22' surrounding the exterior of the shell 2' at the bottom 12'. A second insulative body 23' in the form of a ring, figure 4., is passed over the bottom 12' of the shell 2' and is retained in the passageway 22' of the base 11'. Corner edges of the base 11' are indented inwardly radially at various pointed to provide protrusions 23'a overlapping the insulative body 23' to prevent movement of the insulative body 23'.

electrical circuit elements such as capacitor elements 27' are placed in passages 29 through the ring 23'. The capacitor elements 26' are surrounded by the ring 23', which is supported, figure 6, on a mounting surface 30 of a conductive platform 31.

As shown in figures 2, 3 and 5, the platform 31 comprises stamped and formed metal having an inner opening 32 through its thickness. A set of first conductive resilient spring fingers 33 carry the mounting surface 30, and comprise cantilever beams formed in the thickness of the platform 31 and bent to project into the passages 29 to engage and urge the capacitor elements 26 axially of the connector 1', Figure 6, and into engagement with the base 11' of the shell 2'. Circuit board engaging electrical terminals 34 comprise a second set of conductive spring fingers as cantilever beams formed in the thickness of the platform 31 and bent to project outwardly. The terminals 34 carry a circuit board facing surface 35 of the platform 31, and project in the same direction from the base 11' as the posts and fasteners 13'a and 13'b which project for connection to a circuit board, not shown. Each of the terminals 34 project for resilient engaged connection to a conductive path, not shown, comprising a ground plane of the circuit board.

If a voltage across the shell 2' is induced by RFI, the voltage will be transmitted through the capacitor elements 26', through the thickness of the platform 31 that

is defined between the surfaces 30 and 36. and to a ground plane of a circuit board, not shown, to which the terminals 34 are connected.

The platform 31 is attached to the insulative body 23'. The insulative body 23' includes unitary posts 36 projecting from recesses 37, and extending through openings 38 through the thickness of the platform 31. The openings 38 are surrounded by recesses 39 stamped as offset areas of the platform 31. Ends of the posts 36 that extend through the openings 38 are enlarged by the application of heat and pressure to form enlarged heads 40, Figures 1 and 5, that overlap the openings 38 and retain the platform 31 on the insulative body 23'. The heads 40 are recessed from the bottom surface of the platform 31. The insulative body 23' insulates the platform 31 from contact with the base 11'.

The present embodiment has the advantage that a capacitor element is placed between facing surfaces of an outer metal shell and a metal mounting platform. Another advantage is that the capacitor elements are position in a cavity of the outer metal shell and are biased in engagement with the metal shell by means of metal spring members.

Claims

1. An electrical connector (1) having a conductive contact (6') connected to a circuit board mounting terminal (17'), an insulative body (3') surrounding the contact (6'), a conductive shell (2') surrounding the insulative body (3') a conductive base (11') extending from the conductive shell (2'), and conductive circuit board mounting posts (13') on the base (11'), characterized in that electrical contact between the shell (2') and pads of a circuit board is established by a circuit formed from the base (11'), through a capacitor element (26'), then through a conductive platform (31) to the pads of the circuit board.
2. An electrical connector as claimed in claim 1, characterized in that an insulative body 23') is retained in a passageway (22') of said base (11') and said insulative body (23') includes a passage (29) in which said capacitor element (26') is disposed, with an inner end of said capacitor element (26') engaging said base (11'), and said platform (31) extending along said insulative body (23') and said base (11') and including an electrical terminal (34) extending into said passage (29) and engaging an outer end of said capacitor element (26').
3. An electrical connector (1') as claimed in claim 2, characterized in that said platform (31) is of metal and includes spring fingers (33) extending outwardly from said platform (31).

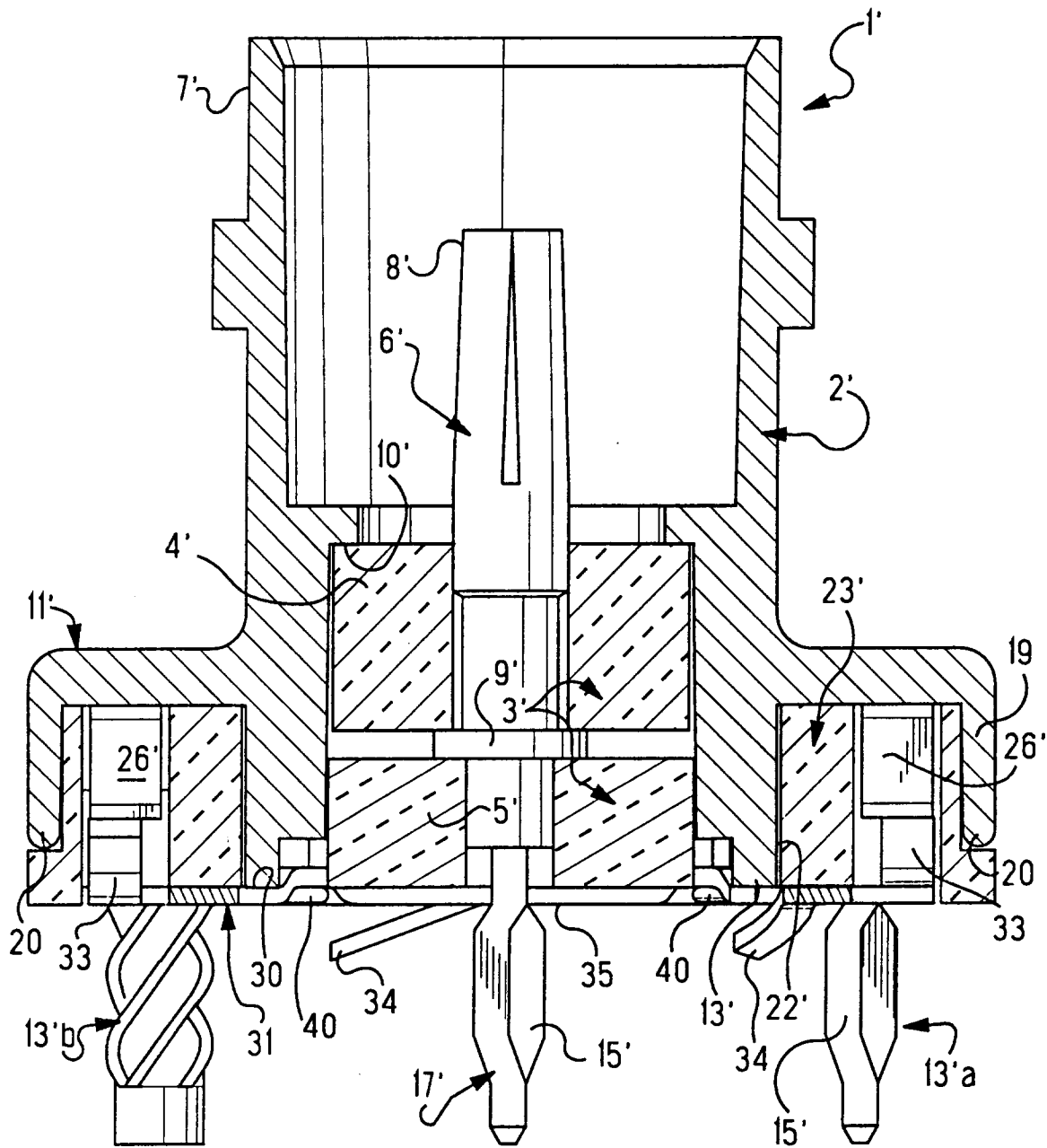
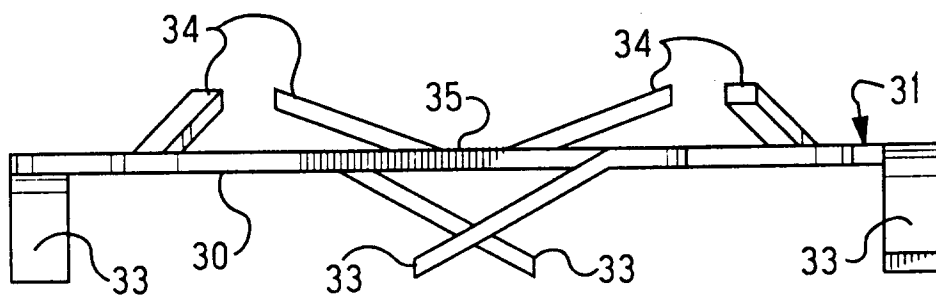
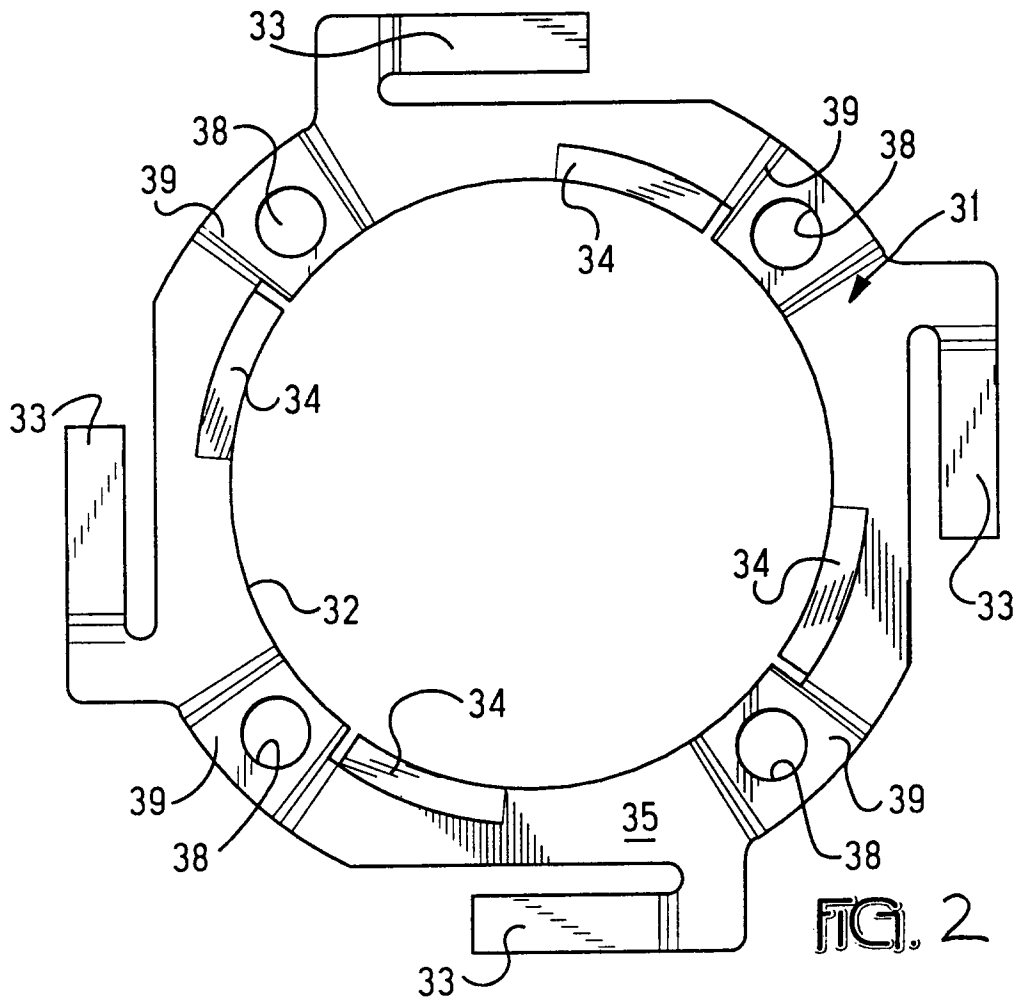
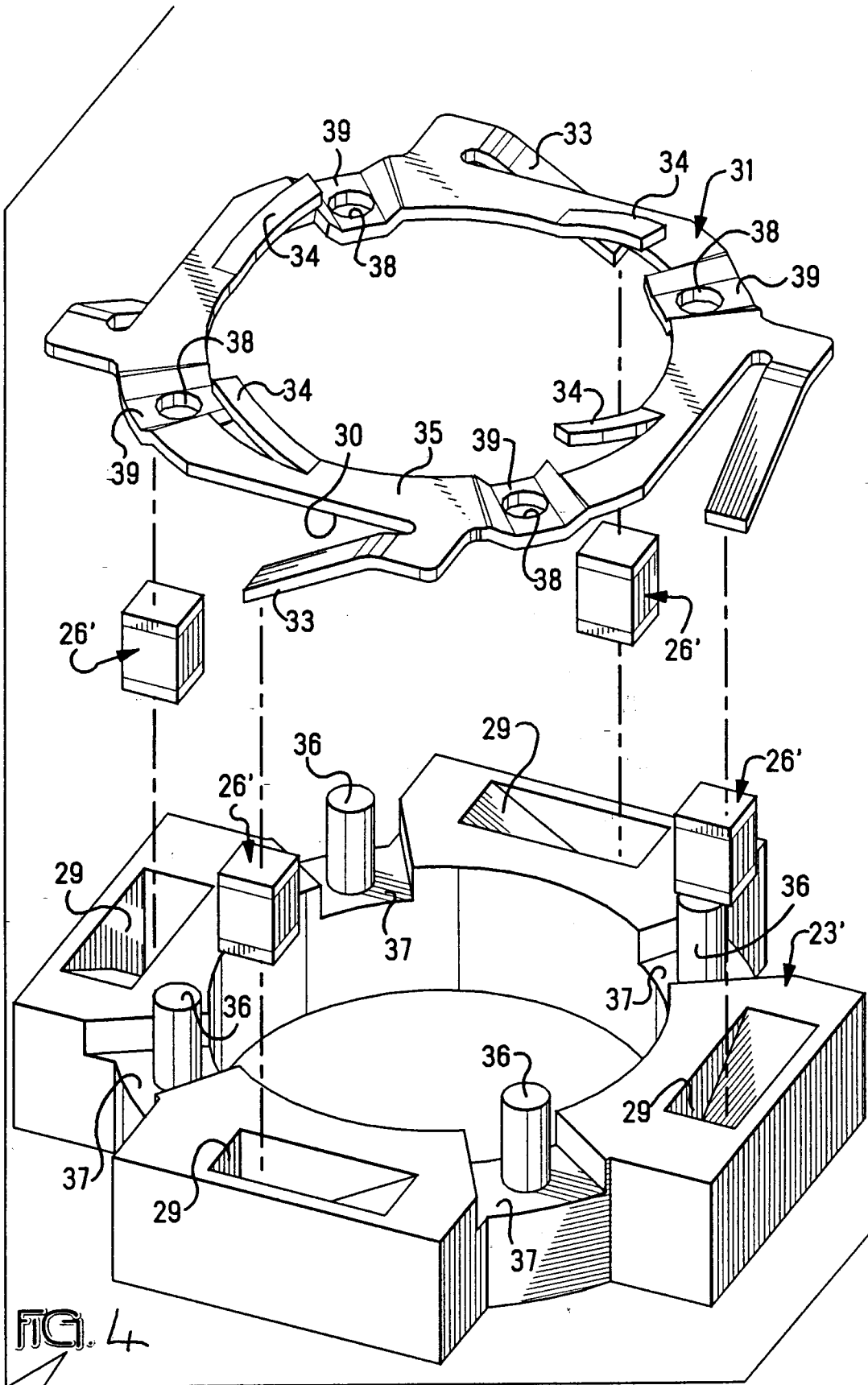


FIG. 1





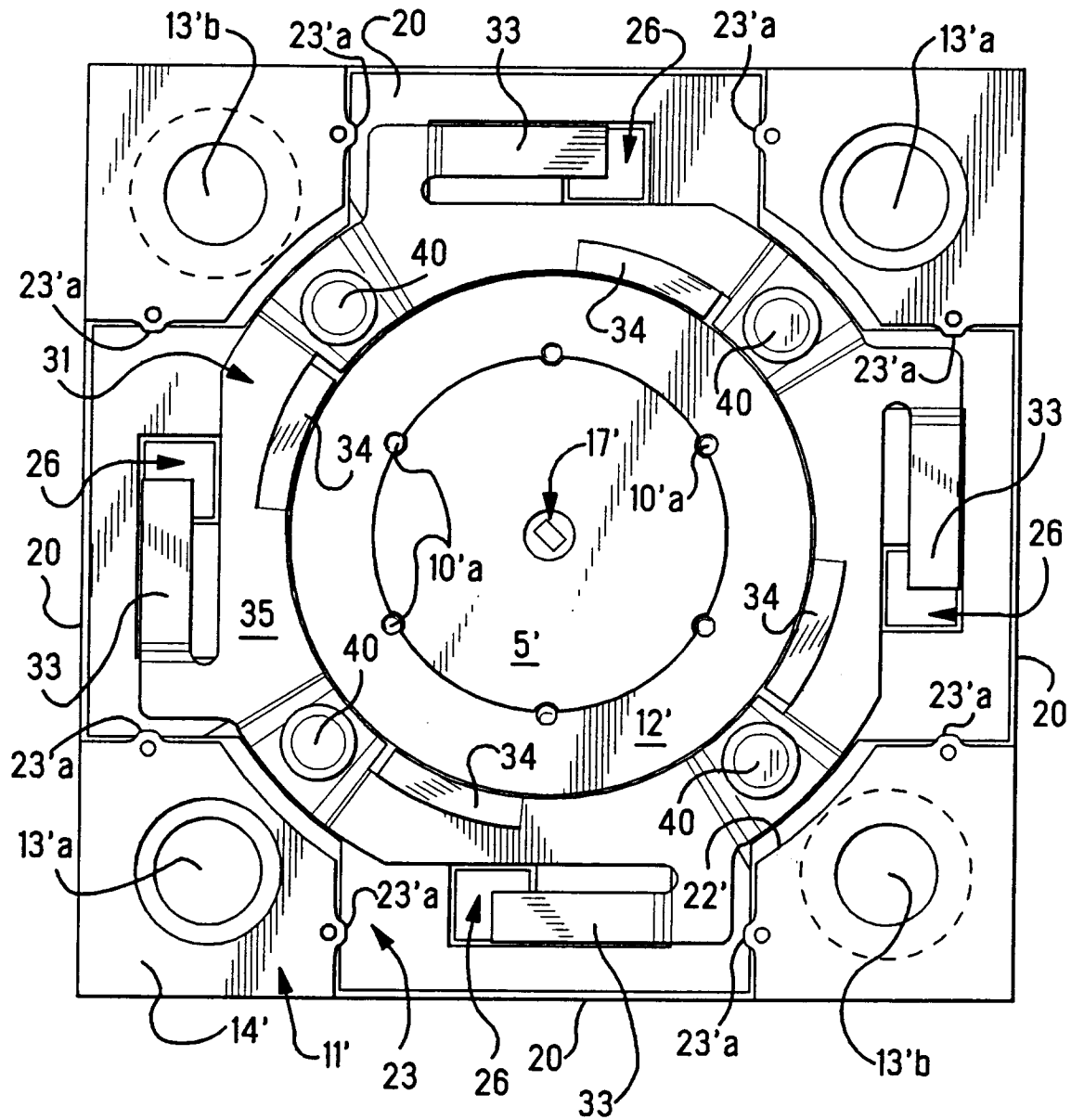


FIG. 5