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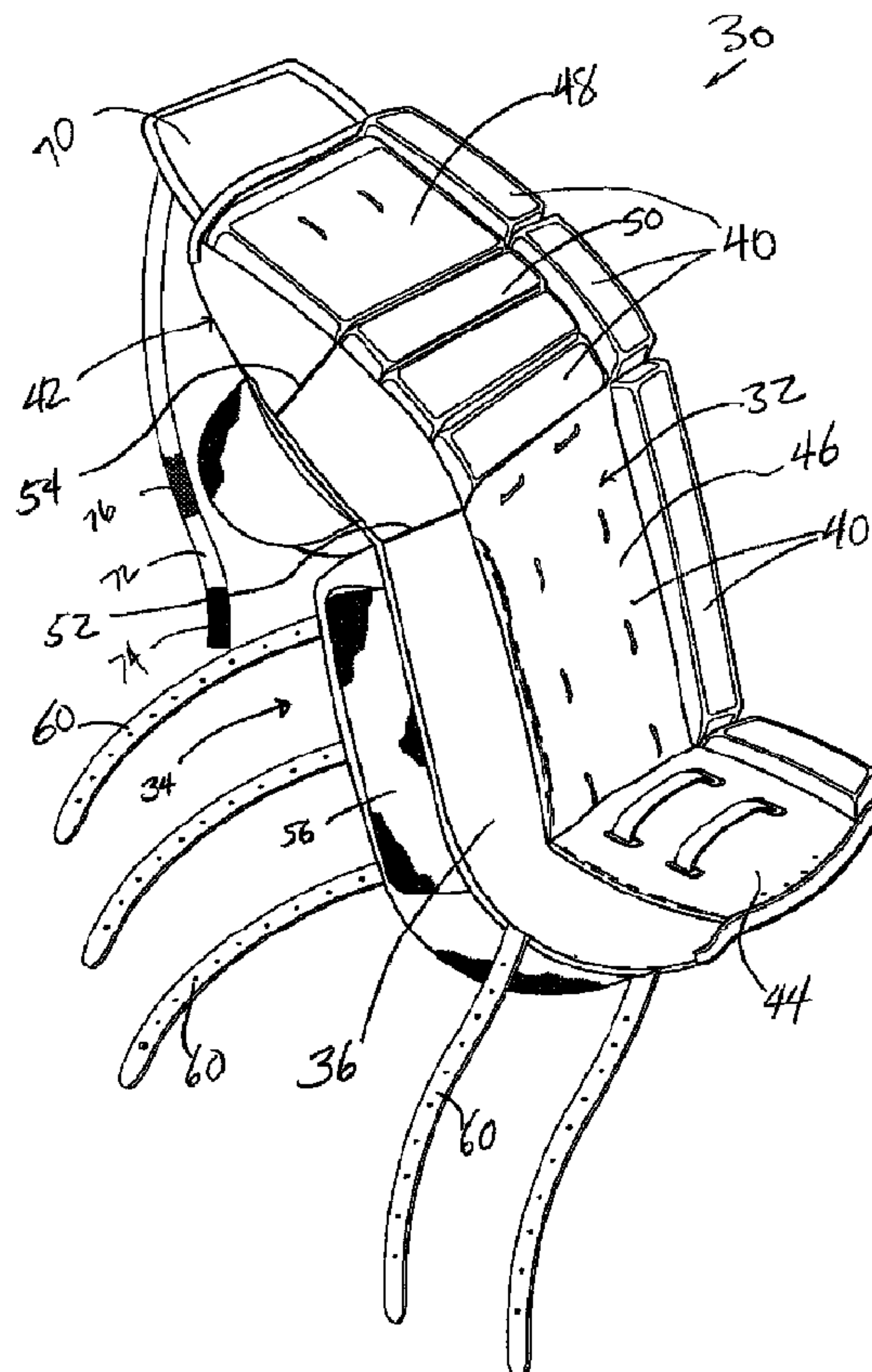
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(54) Title: LEG PAD FOR A HOCKEY GOALKEEPER



PROTECTIVE PADS HAVING CUSTOMIZABLE FLEXIBILITY**Abstract of the Disclosure**

A protective padding system is provided in which a padding member has one or more cavities formed therein. The padding member preferentially flexes at the cavities. An insert is adapted to selectively engage and fit into the cavity. When engaged, the insert reinforces the padding member at the cavity, and thus reduces or eliminates the flexibility of the padding member at that location. By selectively engaging or disengaging an insert, a user may customize the flexibility characteristics of the padding member in a reversible manner.

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LEG PAD FOR A HOCKEY GOALKEEPER

Field of the Invention

- 5 The present invention relates to a leg pad having flex zones that are configured so that a hockey goalkeeper can customize the flexibility of such flex zones.

Background of the invention

- 10 Hockey is a fast-moving, competitive sport involving extensive contact between players and implements such as sticks and pucks. Hockey goalkeepers encounter a particularly high level of such contact as players attempt to advance the puck into a goal guarded by the goalkeeper. The goalkeeper attempts to prevent the puck from entering the goal by catching or blocking the puck with a hockey stick, the
15 goalkeeper's body, and/or pads worn by the goalkeeper.

- Hockey goalkeepers wear an extensive amount of protective gear both to protect their body from injury that may result from impacts with a fast moving puck and to use as tools for blocking the puck. For example, hockey goalkeepers wear bulky leg
20 pads both to protect their legs and to block the puck. A goalkeeper will often drop to one or both knees with his feet spread apart so that one or both of the leg pads contacts the playing surface. The puck cannot pass between the pad and the playing surface and thus will be blocked from entering the goal.

- 25 In view of their role, goalkeeper leg pads generally have a boxy shape and are bulky. Traditionally, such goalkeeper leg pads are relatively inflexible. However, some goalkeepers prefer some flexibility in their pads to facilitate athletic movement by the goalkeeper. Due to their bulky construction, even relatively flexible goalkeeper leg pads typically flex substantially only at specific flex zones. Depending
30 on the particular goalkeeper's size and style, however, targeted flexure at a particular flex zone may not be to that goalkeeper's liking. For example, some

goalkeepers prefer a flex zone immediately below the knee while others prefer a flex zone immediately above the knee. Also, the desired degree of flexibility of the flex zones may vary between goalkeepers. To obtain leg pads having their desired flexibility characteristics, goalkeepers often must custom-order such pads.

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Summary of the invention

Accordingly, there is a need in the art for a protective gear system, specifically a protective padding system, which allows the user to customize the flexibility characteristics of a particular pad member according to his liking.

In accordance with one embodiment, the present invention provides a selectively customizable padding apparatus. The apparatus comprises a pad member having a surface, a plurality of cavities formed in the pad member, and a plurality of inserts sized and adapted to selectively fit into a selected one of the cavities. The pad member is configured to preferentially flex at each of the cavities. The insert is configured to resist flexure of the corresponding cavity when the insert is engaged in the cavity so as to make the pad member more rigid at the cavity. The hockey goalkeeper may selectively control the location and flexibility of portions of the pad member by selectively engaging or disengaging one or more inserts into one or more of the cavities.

In some embodiments, the insert is configured to resist compression of the cavity when the insert is engaged with the cavity. In other embodiments, a system is provided including inserts of various compliance characteristics, and a user can vary flexure characteristics of the pad member by selectively engaging particular inserts in cavities at particular locations.

In accordance with another aspect, the invention provides a leg pad for a hockey goalkeeper, comprising: (a) a pad member having a foot portion for at least partially covering the foot, a lower leg portion for at least partially covering the shin, a knee

portion for at least partially covering the knee, an upper leg portion above the knee portion, a first padding segment, a second padding segment, a third padding segment, a first hinge portion defined between the first and second padding segments and extending transversely relative to the pad member, and a second
5 hinge portion defined between the second and third padding segments and extending transversely relative to the pad member, the pad member being configured to flex at the first and second hinge portions so that the first and second padding segments pivot about the first hinge portion and the second and third padding segments pivot about the second hinge portion, the pad member further
10 comprising a first cavity formed at the first hinge portion and extending transversely along the first hinge portion; and (b) a first insert being formed separately from the pad member and being sized and adapted to fit into the first cavity; wherein, in use, a hockey goalkeeper may selectively modify flexibility of the pad member at the first hinge portion by selectively engaging or disengaging the first insert into the first
15 cavity.

In another embodiment, the pad member comprises a plurality of inserts adapted to be selectively engaged into the cavity, and the plurality of inserts each have different flexibility characteristics.

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In yet another embodiment, the pad member comprises a plurality of cavities, and the location of preferentially flexible zones of the pad member are determined by selectively engaging an insert into a specific one or ones of the cavities.

25 In some embodiments the insert has a cross sectional shape that is substantially complementary to the cavity. In further embodiments the insert comprises a block portion that is sized to fit in the cavity and configured to resist compression of the cavity when the pad member is subjected to forces. In still other embodiments the insert comprises a web portion sized and configured to reinforce the pad member
30 against bending. In yet further embodiments, the cavity extends across substantially the entire width of the pad member. In some such embodiments the insert has a

length substantially the same as a length of the cavity. In other such embodiments the insert has a length substantially less than a length of the cavity.

5 In still another embodiment, the pad member comprises a padding segment and a cavity liner. The padding segment comprises a first material, and the cavity liner comprises a second material. The second material is less compliant than the first material, and the cavity is formed in the cavity liner.

Brief description of the drawings

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Figure 1 is a perspective view of an embodiment of a leg protection member adapted to be attached to a hockey goalkeeper's left leg.

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Figure 2 is a side elevational view of a first, inner side of the leg protection member of Figure 1.

Figure 3 is a side elevational view of a second, outer side of the leg protection member of Figure 1.

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Figure 4 is a close up view of a portion of the first side of Figure 2, showing a zipper member open so as to expose a pad member of the leg protection member.

[0019] FIGURE 5A is a perspective view of an insert adapted to fit complementarily into a corresponding cavity formed in the pad member of FIGURE 4.

[0020] FIGURE 5B is a cross-sectional view of the insert of FIGURE 5A.

[0021] FIGURE 6 is a schematic side view of a pad member of a hockey goalkeeper leg protection member in accordance with one embodiment.

[0022] FIGURE 7 is a perspective view of an insert configured to be used with the pad member of FIGURE 6.

[0023] FIGURE 8 is a schematic back view of the pad member of FIGURE 6 with a cover removed and showing tubular inserts being inserted into first and second cavities.

[0024] FIGURE 9 is a schematic back view of the pad member of FIGURE 6 with the cover in place.

[0025] FIGURE 10A is a schematic side view of an embodiment of a pad member of a hockey goalkeeper leg protection member, shown in a first configuration with stiffening inserts disposed in first and second cavities.

[0026] FIGURE 10B shows the pad member of FIGURE 10A in a configuration in which a first insert is disposed in the first cavity but the second cavity has no insert and thus a second hinge portion is flexible, thus defining a second flex zone.

[0027] FIGURE 10C shows the pad member of FIGURE 10A in a configuration in which a second insert is disposed in the second cavity but the first cavity has no insert and thus a first hinge portion is flexible, thus defining a first flex zone.

[0028] FIGURE 10D shows the pad member of FIGURE 10A in a configuration in which the first and second cavities both do not have inserts, and thus the first and second hinge portions are flexible and define first and second flex zones.

[0029] FIGURE 11 is a schematic partial perspective view of an embodiment of a pad member having a cavity with a generally triangular cross-section formed therein and also showing an insert adapted to selectively fit into the cavity.

[0030] FIGURES 12A to 12E are cross-sectional views of embodiments of inserts that may fit into complementarily-shaped cavities formed in additional embodiments of padding members.

[0031] FIGURE 13A is a schematic side view of another embodiment of a pad member having a cavity formed therein, and an insert adapted to fit into the cavity.

[0032] FIGURE 13B shows the embodiment of FIGURE 13A with the insert fit into the cavity.

[0033] FIGURE 14A is a schematic side view of yet another embodiment of a pad member having a cavity formed therein, and an insert adapted to fit into the cavity.

[0034] FIGURE 14B shows the embodiment of FIGURE 14A with the insert fit into the cavity.

[0035] FIGURE 15A is a schematic side view of still another embodiment of a pad member having a cavity formed therein, and an insert adapted to fit into the cavity.

[0036] FIGURE 15B shows the embodiment of FIGURE 15A with the insert fit into the cavity.

[0037] FIGURE 16A is a perspective view of the insert of FIGURES 15A and B.

[0038] FIGURE 16B is a perspective view of a block portion of the insert of FIGURE 16A.

[0039] FIGURE 16C is a perspective view of a web portion of the insert of FIGURE 16A.

[0040] FIGURE 17 is a schematic side view of yet another embodiment of a pad member having first and second cavities and showing first and second inserts fitting complementarily within such cavities, and the first and second inserts have different cross-sectional shapes.

[0041] FIGURE 18 is a schematic side view of still another embodiment of a pad member in which cavities are formed through the pad member between the front and back surfaces of the pad member.

[0042] FIGURE 19 is a schematic side view of a further embodiment of a pad member in which cavities are formed in a front side of the pad member, and a first insert is generally rigid, but a second insert is flexible and facilitates bending of the pad member at a second flex zone.

[0043] FIGURE 20 is a schematic side view of still another embodiment of a pad member having more than two cavities.

[0044] FIGURE 21 is a schematic back view of a pad member having cavities formed generally diagonally across the pad member.

[0045] FIGURE 22A is a schematic side view of yet another embodiment of a pad member having cavities formed therein.

[0046] FIGURE 22B shows the pad member of FIGURE 22A in conjunction with inserts adapted to fit into the cavities.

[0047] FIGURE 22C shows the pad member of FIGURE 22B with the inserts fit into cavities in the pad.

[0048] FIGURE 23 is a perspective back view of an embodiment of a pad member having features in accordance with FIGURES 22A-C and showing placement of inserts into corresponding insert seats

[0049] FIGURE 24A is a perspective front view of an insert in accordance with another embodiment.

[0050] FIGURE 24B is a perspective back view of the insert of FIGURE 24A.

[0051] FIGURE 24C is a perspective back view of a pad member showing an insert as in FIGURES 24A and B being fit into a cavity formed in the pad member.

[0052] FIGURE 25 is a perspective back view of another embodiment of a pad member having cavities formed in a portion of material that is more rigid than other portions of the pad member.

Detailed Description of Preferred Embodiments

[0053] Embodiments will be disclosed in connection with the above-described figures. These embodiments involve a hockey goalkeeper leg protection member, which benefits substantially from aspects of the present invention. However, it is to be understood that the discussion herein in context of such a hockey implement is made to illustrate inventive aspects, and the present invention is not limited to protective pads for hockey. Rather, principles discussed herein can be applied to any padding system in which flexure customization could be beneficial.

[0054] With first reference to FIGURES 1-3, a leg protection member 30 is illustrated. The illustrated leg protection member 30 is specially configured to be attached to a hockey goalkeeper's left leg. Preferably, a symmetrical leg protection member is configured

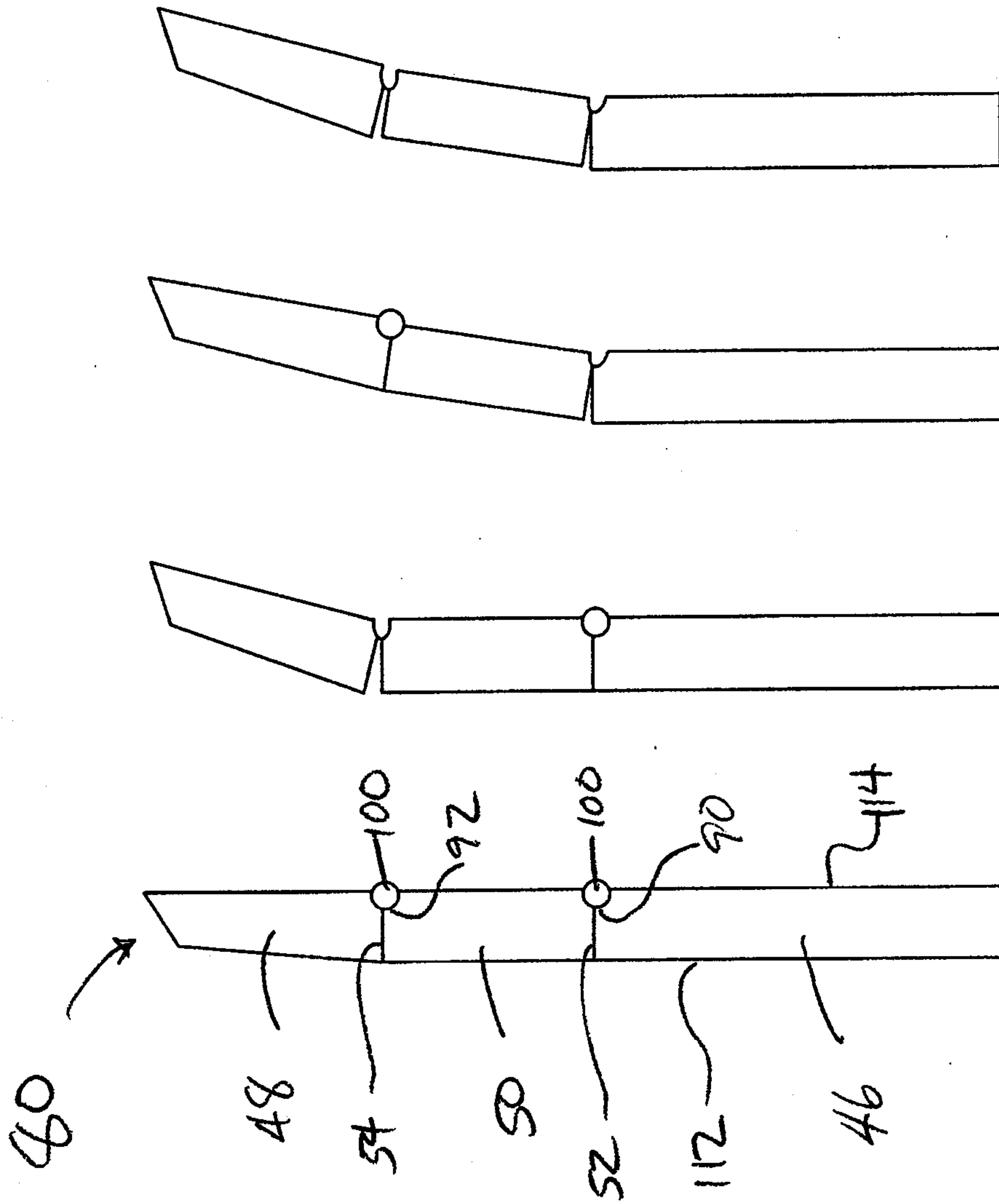


FIG. 10A FIG. 10B FIG. 10C FIG. 10D

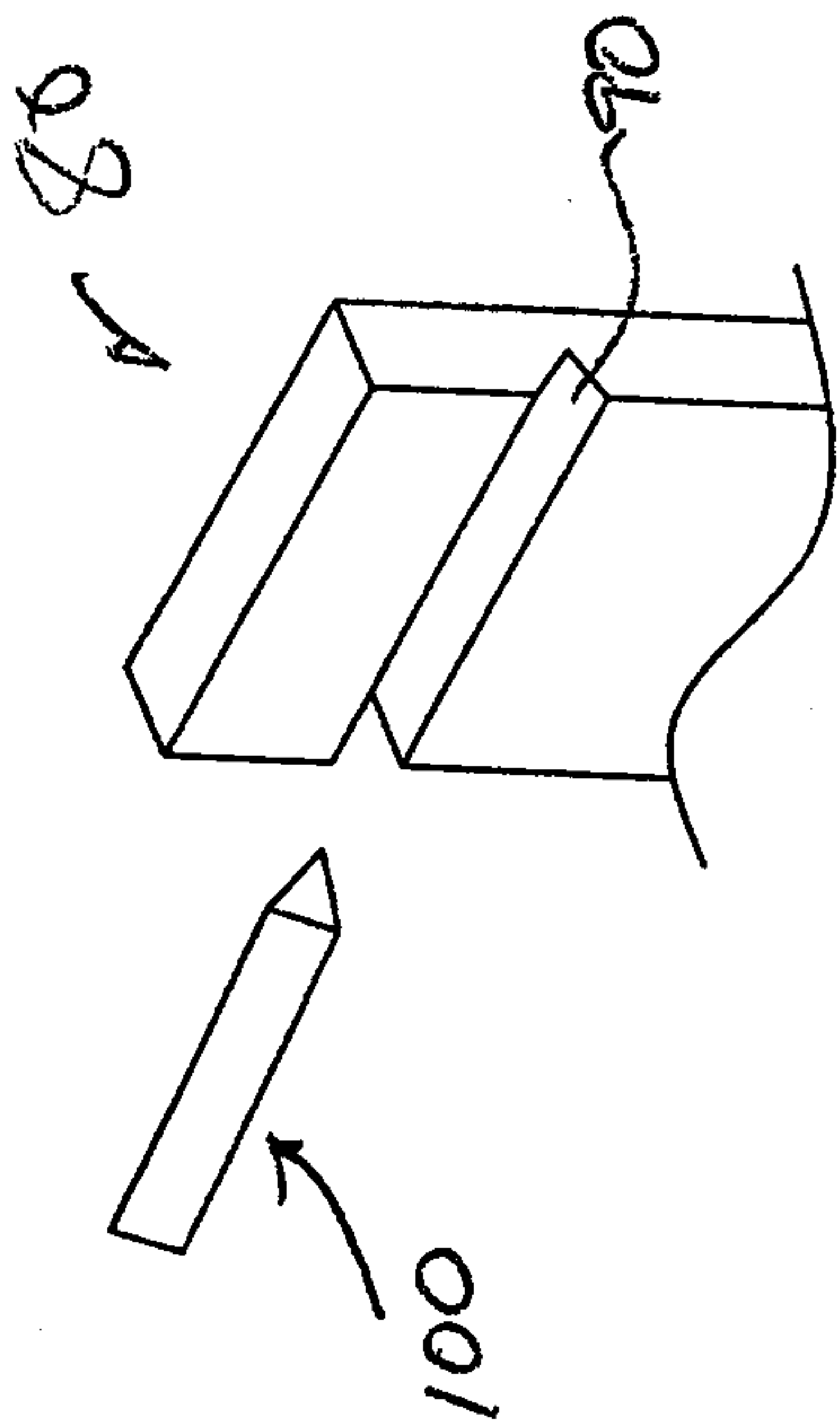


FIG. 11

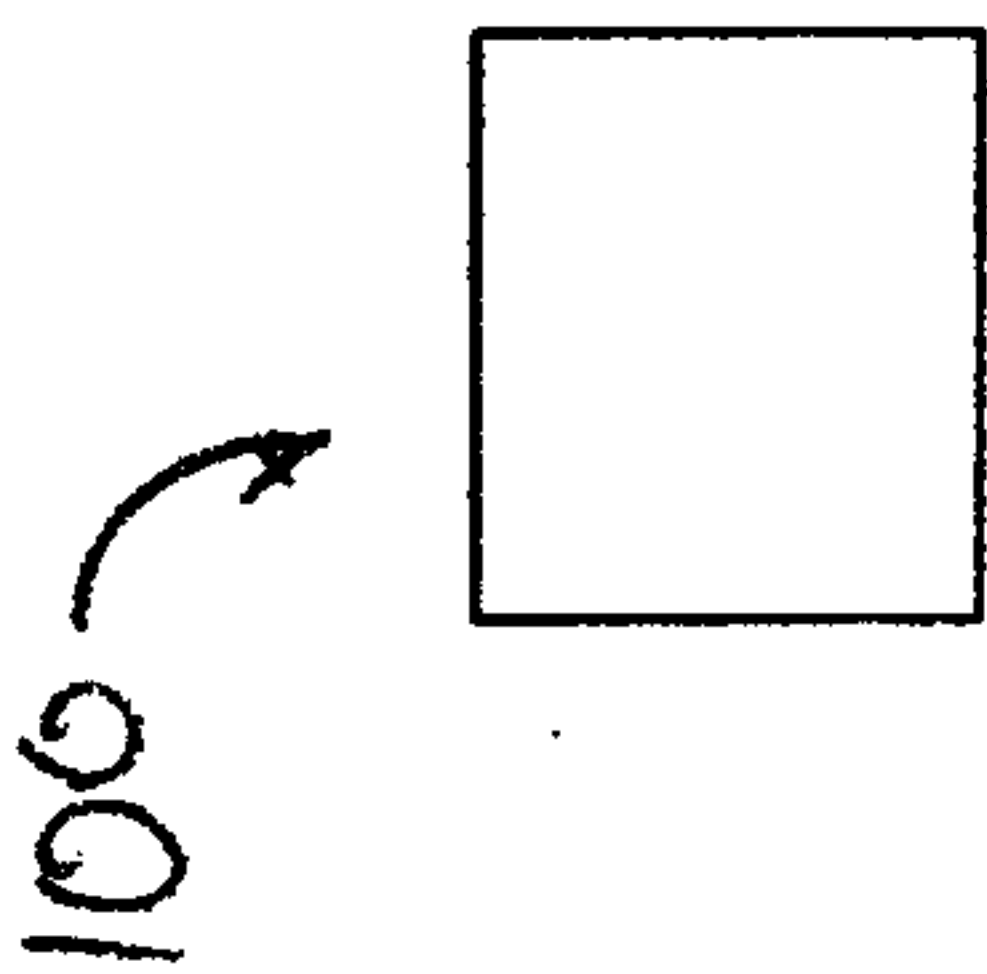


FIG. 12A

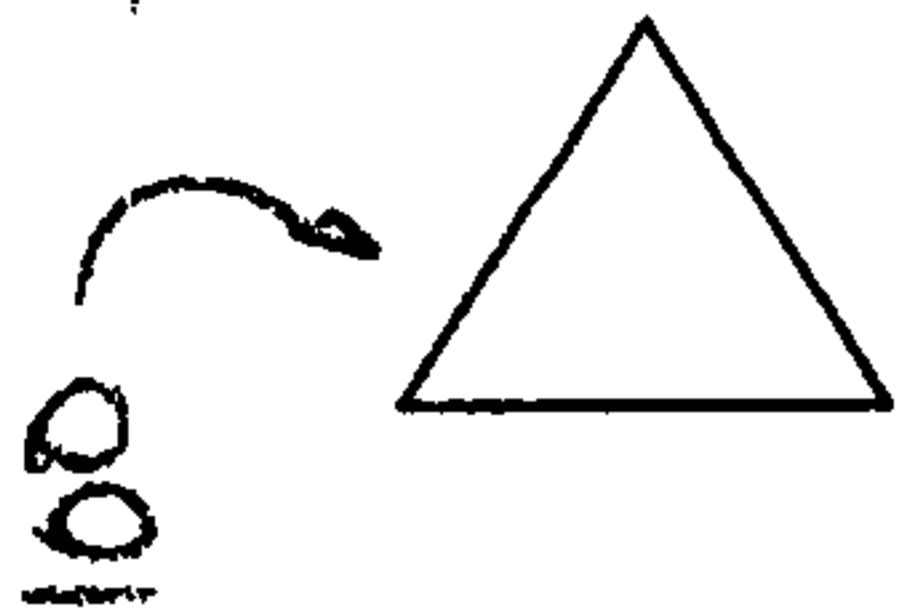


FIG. 12B

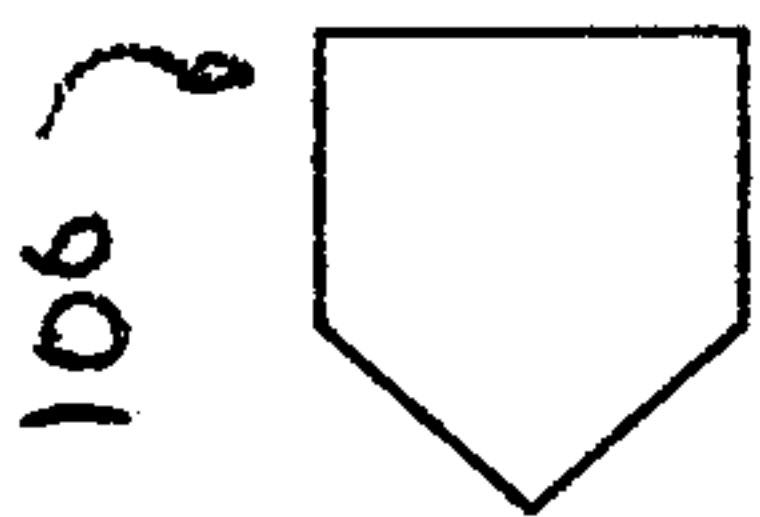


FIG. 12C



FIG. 12D

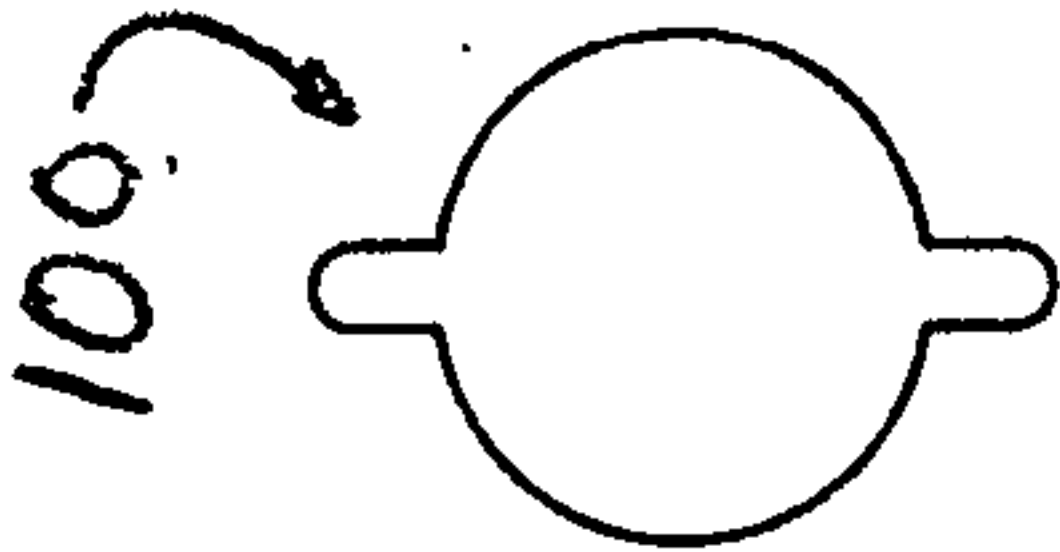
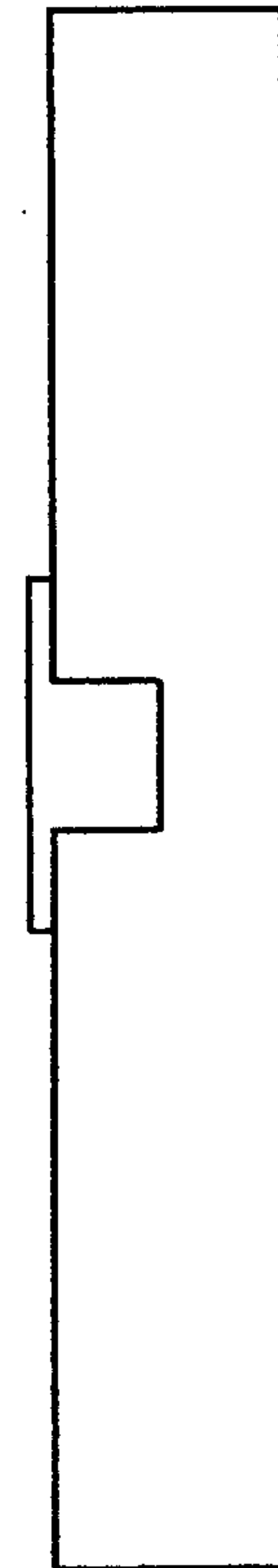
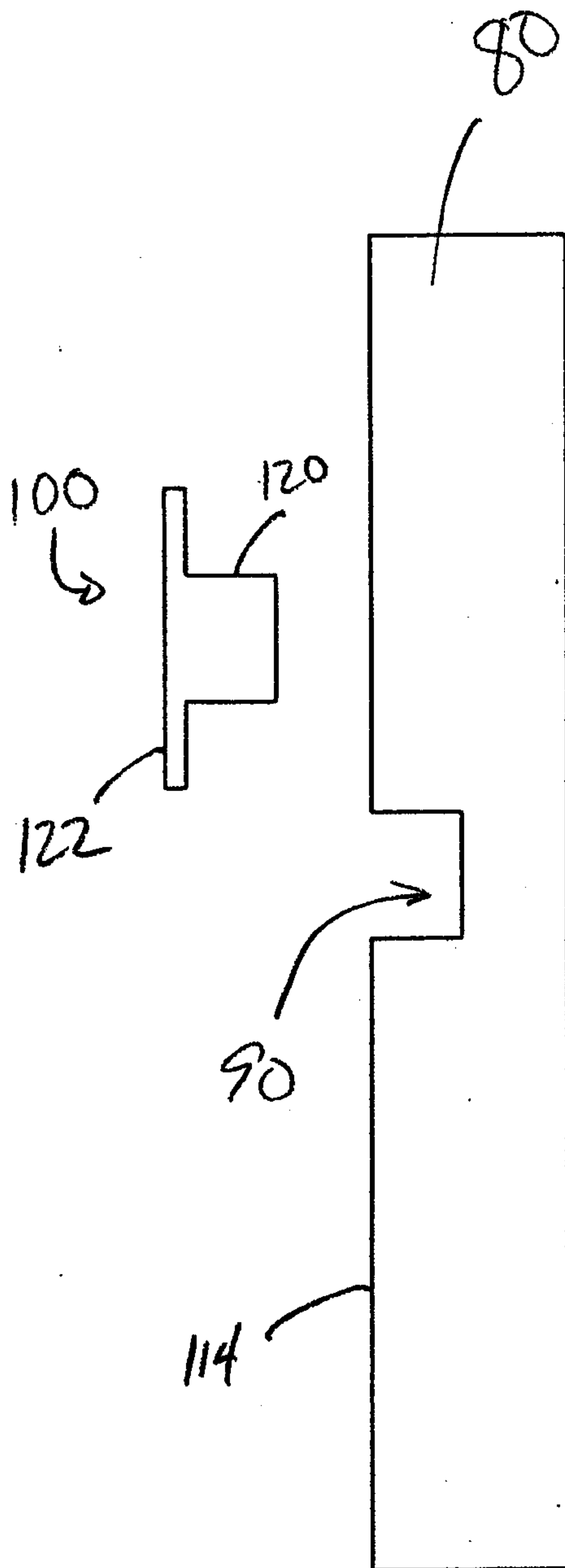


FIG. 12E



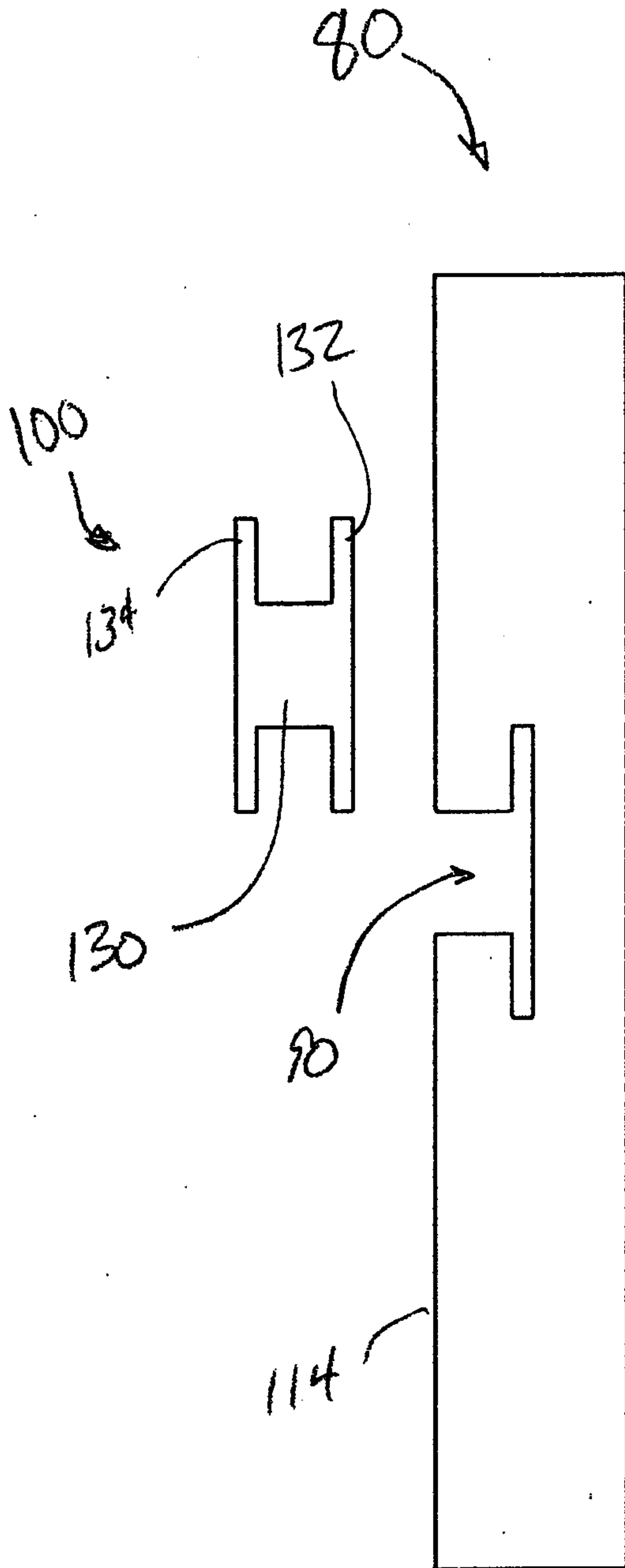


FIG. 14A

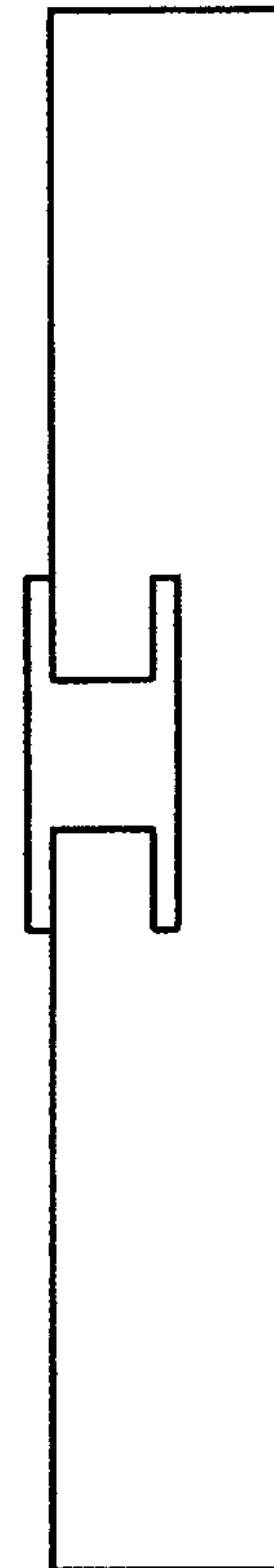


FIG. 14B

