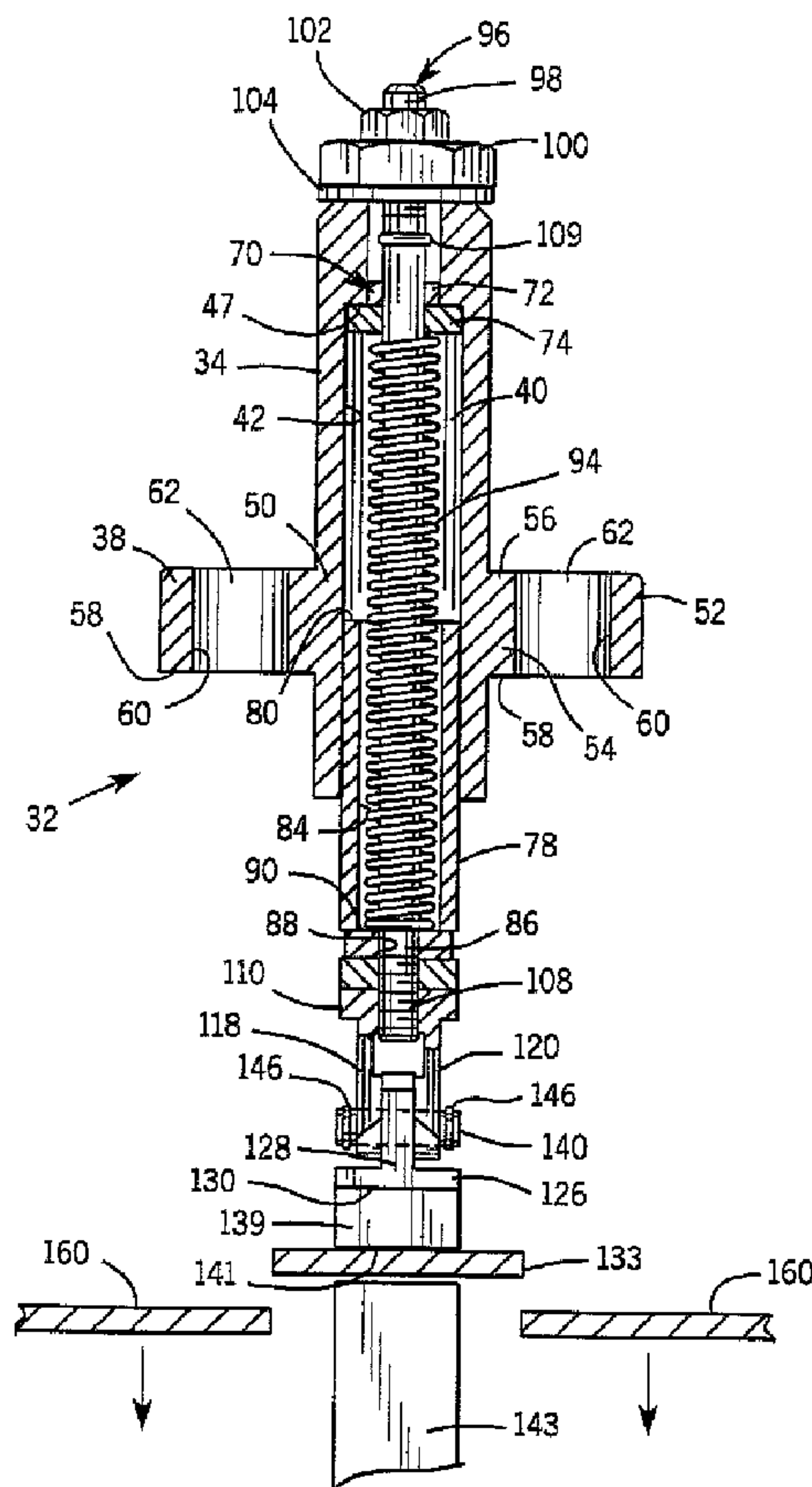




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(57) Abrégé/Abstract:

A presser assembly (10) is provided for supporting carton blanking scrap during a blanking operation. The presser assembly (10) includes a presser rail (114) having a first end (116) mounted to a guide cylinder (32) and a second end (154) mounted to a



(57) **Abrégé(suite)/Abstract(continued):**

second guide cylinder (32) such that each end of the presser rail is vertically movable independent of the opposite end. This, in turn, prevents jamming of the presser assembly during the blanking operation.



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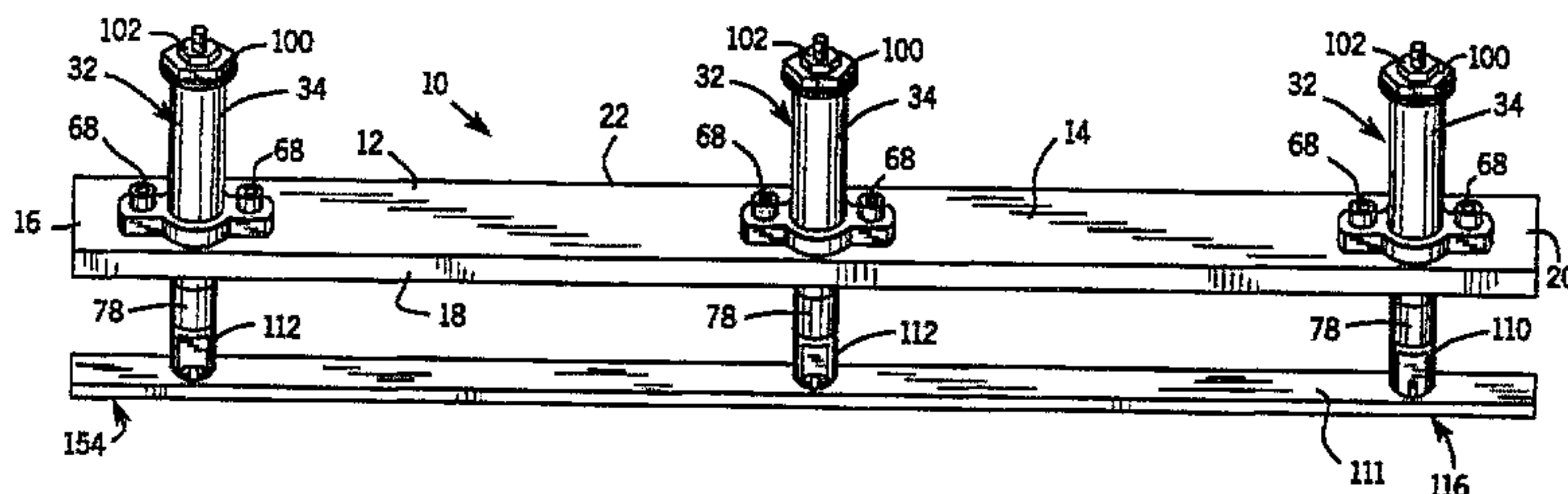
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(57) Abstract

A presser assembly (10) is provided for supporting carton blanking scrap during a blanking operation. The presser assembly (10) includes a presser rail (114) having a first end (116) mounted to a guide cylinder (32) and a second end (154) mounted to a second guide cylinder (32) such that each end of the presser rail is vertically movable independent of the opposite end. This, in turn, prevents jamming of the presser assembly during the blanking operation.

PRESSER ASSEMBLY**Background of the Invention**

5 This invention relates to a blanking operation, and in particular, to a presser assembly for supporting carton blanking scrap during a blanking operation.

In the manufacture of cartons, small sheets of material are cut out of larger sheets. These smaller sheets are known as carton blanks which, in turn, are formed into boxes. The blanks are formed during a process known as a blanking operation.

10 In a blanking operation, the blanks are cut, but not removed, from the large sheet of material. After the blanks have been cut, the sheet is positioned over a frame for support. The frame includes large openings which correspond in size and in position to the carton blanks previously cut. Below the frame is
15 a mechanism for stacking the blanks.

In order to knock the carton blanks from the sheet of material and hold the scrap material, a presser assembly is used. The presser assembly includes a support tool having a presser member and a presser rail depending therefrom. The presser
20 rail is biased away from the support tool. As the support tool is lowered, the presser rail engages the sheet of material such that the large sheet of material is secured between the presser rail and the frame. The support tool continues to be lowered such that the presser member engages the carton blanks and knocks
25 the blank out of the sheet of material. The carton blanks fall onto a stacking mechanism wherein the blanks are stacked.

If a carton blank is not completely knocked out from the sheet of material, it is possible that the carton blank scrap may be forced by the presser member onto the stacking mechanism.

Druckexemplar

In addition, if the presser rail does not adequately hold the carton blanking scrap, the scrap may fall onto the stacking mechanism. A carton blanking scrap in the stacking mechanism may jam the mechanism thereby causing downtime, and hence, expense.

In order to securely hold the carton blank scrap, the present day presser rails are interconnected to the support tool by a plurality of guide cylinders. Each guide cylinder biases the presser rail away from the support tool. This gives the presser rail a certain amount of flexibility when engaging the carton blanking scrap. However, even with this limited flexibility, present day presser rails have been found to be inadequate.

An example can be found in DE-A-3 033 648. This document describes a presser assembly of the type referred to above for supporting carton blanking scrap during a blanking operation.

Therefore, it is the primary object and feature of this invention to provide a presser assembly having a presser rail which securely holds carton blanking scrap during a blanking operation.

It is a further object and feature of the present invention to provide a presser assembly having a presser rail which is durable and maintains its shape over an extended period of time.

It is still a further object and feature of the present invention to provide a presser assembly which is easy to assemble and easy to mount to standard blanking operation machinery.

Summary of the Invention

In accordance with the present invention, a presser assembly is provided for supporting carton blanking scrap during a blanking operation. The presser assembly comprises a hollow housing including a cavity formed there-through defining an open top and an open bottom; a longitudinally extending stem slidably received within said cavity for reciprocal movement therein and having an upper end projecting from said open top and a lower end projecting from said open bottom; a presser rail; connector means for connecting the lower end of said stem to said presser rail; bias means for biasing said presser rail away from said housing; stop means at the upper end of said stem engagable with said housing for limiting the movement of said rail away from said housing; and a guide member surrounding said stem and received within the open bottom of said cavity in telescoping relation with said housing for guiding said presser rail during its vertical reciprocating movement.

A plurality of presser assemblies in this invention may be used to support a presser rail, spaced along the length of the rail. In one embodiment, the connector means for each presser assembly comprises a clevis attached to the lower end of the stem and pivotally mounted on the rail. The bias means may comprise a spring arranged about the stem such that one end engages a bushing within the housing so as to bias the presser rail away from the support member.

Each clevis includes first and second side walls.

Each side wall has an aperture which is in horizontal and vertical alignment with the other aperture. A pin extends through the vertically and horizontally aligned apertures in the clevis and a portion of the presser rail in order to interconnect the rail to each stem. The apertures in the clevis attached to one end of the presser rail are circular while the apertures in the other clevis are generally oblong in shape. The shape of the apertures allows each end of the presser rail to move vertically independently of the other end.

One feature of the presser assembly is that the stem is independent of the tubular guide member. In other words, the stem is not integral with or permanently connected to the guide member. This advantageously enables the stem and guide member to be more flexible with respect to one another thus preventing fractures which often occurred in prior art assemblies which welded these two components together. In the prior art, the weld caused the stem and guide member to be a rigid inflexible assembly which, in turn, resulted in the stem fracturing over time. Once the stem fractured the guide member, clevis and presser rail could drop into the blanking machine causing damage to the machine and consequent down time. Thus, the independence of the stem and guide member avoids fracturing of the stem and such consequent damages.

AMENDED

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Another feature is the use of a vent hole in the housing which is located above the top dead center location of the reciprocating tubular guide member. This vent hole prevents paper dust from being sucked into the housing after a cutting operation. Without such a vent hole, a suction is formed within the housing as the housing returns upwardly after a cutting operation. This suction has a tendency to draw paper dust into the housing and in particular between the sliding surfaces of the housing and reciprocating tubular guide member. This paper dust acts as an abrasive which unless cleaned will damage the guide member causing costly repairs. Thus, the vent hole enables atmospheric air to enter into the housing to prevent a vacuum from forming therein.

Yet another feature of the invention is the provision of a crowned top surface for the housing. This crowned surface cushions the blow of the housing against the mounting for the upper end of the stem. This advantageously avoids fracturing or breaking of the stem over time.

In yet another aspect of the invention, there is provided a means for preventing the relative rotation of the housing with respect to the stem and presser rail. This rotation preventing means is employed when a single presser assembly is utilized with a presser rail. Under such circumstances, the presser rail must be prevented from rotating with respect to the housing so that it is always properly positioned in the blanking operation. A universal coupling is also employed to connect the presser rail to the clevis so that the presser rail is flexible and self aligning with respect to the sheet of material in the blanking operation.

Finally, although described and illustrated herein for use in a blanking operation, the presser assembly could just as readily be employed in a stripping operation where scrap is stripped away from the carton blanks after being die cut.

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Brief Description of the Drawings

The drawings furnished herewith illustrate a preferred construction of the present invention in which the above advantages and features are clearly disclosed as well as others which will be readily understood from the following description of the illustrated embodiment. In the drawings:

Fig. 1 is an isometric view of a presser assembly of the present invention.

Fig. 2 is an exploded, isometric view of a guide cylinder of the presser assembly shown in Fig. 1.

Fig. 3 is a cross-sectional view of a housing of the guide cylinder shown in Fig. 2.

Fig. 4 is a cross-sectional view of a guide member of the guide cylinder shown in Fig. 2.

Fig. 5 is an end view of a portion of the presser assembly of Fig. 1.

Fig. 6 is an isometric view of a clevis having an oblong opening in each side wall of the presser assembly shown in Fig. 1.

Fig. 7 is an isometric view of a lock ring for mounting a guide cylinder to the presser rail as shown in Fig. 5.

Fig. 8 is a side elevation view of a portion of a presser rail of the presser assembly shown in Fig. 1.

Fig. 9 is a partially exploded end view in cross section of a guide cylinder and a pressure rail of the present invention.

Fig. 10 is a cross-sectional end view of a guide cylinder and a presser rail of the present invention.

Fig. 11 is a side elevation view of a second embodiment of the presser assembly of the present invention illustrating the use of a single presser assembly with a short presser rail.

Fig. 12 is an end view of the presser assembly and rail of Fig. 11.

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Fig. 13 is a cross-sectional view of a guide member for the presser assembly of Fig. 11.

Fig. 14 is a side elevation view of a third embodiment of the presser assembly of the present invention illustrating an alternate means for connecting a presser assembly to a short rail.

Fig. 15 is a cross sectional view taken along the plane of the line 15-15 in Fig. 14.

Description of the Illustrated Embodiments

Referring to Fig. 1, a presser assembly in accordance with the present invention is generally designated by the reference number 10. The presser assembly 10 includes a support 12 which is moved vertically during a blanking operation. As shown in Fig. 1, the support 12 is an elongated member having a first, upward face 14 and a second, downward face 15, Fig. 9. Each face is connected by four sides 16, 18, 20, and 22. In addition, each face is interconnected by an aperture 24 extending through support 12. The aperture is defined by a circular side wall 26 which engages face 14 at edge 28 and engages the downward face 15 at edge 30. Aperture 24 is provided in support 12 to facilitate the mounting of a cylindrical guide cylinder 32 to the support 12.

Referring to Figs. 2, 3, 9 and 10, the cylindrical guide cylinder 32 includes a housing 34 for mounting to support 12. The housing 34 includes a tubular body portion 36 and shoulder portion 38 extending outwardly therefrom. Tubular portion 36 includes a cavity 40 defined by circular wall 42. A passage 44 defined by cylindrical wall 46 communicates with cavity 40. Walls 42 and 46 are joined by a flat, circular shoulder 47.

Shoulder portion 38 of housing 34 includes a first arm 50 and second arm 52 interconnected by a neck portion 54 about the periphery of tubular portion 36. Each arm 50, 52 has an upper surface 56 and a lower surface 58. Each surface 56 and

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58 is interconnected by a circular wall 60 which defines a bolt passage 62. In order to connect housing 34 to support 12, bolts 64 extend through bolt passage 62 in each arm 50, 52 of the housing 34. The bolts 64 are threaded into bolt receipt apertures 66 in the support 12. Each bolt 64 has a head 68 having a diameter greater than that of each bolt passage 62 in order to prevent housing 34 from sliding axially off bolts 64 when the bolts 64 are threaded into bolt receipt apertures 66.

Referring to Figs. 9 and 10, after mounting the housing 34 to support 12, a tubular guide member 78 is attached to housing 34. Cavity 40 in housing 34 is provided for axial receipt of tubular guide member 78. The tubular guide member 78 includes an upper end 80 orientated toward shoulder 47 of housing 34. Referring to Fig. 4, tubular guide member 78 also includes a cavity 82 defined by a cylindrical wall 84. Cavity 82 communicates with a passage 86 which is defined by cylindrical wall 88. Cylindrical walls 84 and 88 are joined by a flat circular shoulder 90.

As best seen in Figs. 2, 9 and 10, in order to interconnect housing 34 to tubular guide member 78, stem 92 is provided. Stem 92 is inserted through passage 86 of tubular guide member 78, through a spring 94, and through a bushing 70. Bushing 70 includes a tubular body portion 72 and a head portion 74.

A snap ring 109, Fig. 9, may be placed in groove 111 about the circumference of stem 92 in order to limit the axial distance tubular guide member 78 may be biased away from bushing 70. This, in turn, facilitates the connecting of the tubular member to 78 to the housing 34. After connecting the tubular member 78 to presser rail 114, as hereafter described, snap ring 109 maintains spring 114 and bushing 70 on stem 92 when inserting stem 92 through passage 44 in housing 34. As stem 92 and bushing 70 are axially slid into cavity 40, the upper

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surface 76 of the head portion 74 of bushing 70 engages shoulder 47 of housing 34 and a first end 96 of stem 92 extends through passage 44 in housing 34. First end 96 of stem 92 includes threads 98 for receipt of nuts 100 and 102 to prevent stem 92 from sliding back through passage 44. A washer 104 may be placed between the upper portion 35 of housing 34 and nut 100.

A second end 106 of stem 92 also includes threads 108 to facilitate mounting the stem 92 to a clevis 110. When assembled, spring 94 axially bears against head 74 of bushing 70 and against shoulder 90 in tubular guide member 78 so as to bias tubular guide member 78 away from bushing 70. When interconnected to housing 34 and tubular guide member 78, stem 92 limits the axial distance tubular guide member 78 may be biased away from bushing 70.

There are two types of clevises for use with the presser assembly 10 of the present invention. Each clevis 110, 112 is used to interconnect the guide cylinder 32 to the presser rail 114. First clevis 110 is used to interconnect guide cylinder 32 to a first end 116, Fig. 1, of the presser rail 114. First clevis 110 includes first and second side walls 118, 120 which depend from a cylindrical body portion 122. Each side wall 118, 120 includes an aperture 124 which is horizontally and vertically aligned with the aperture on the opposing side wall. Aperture 124 in clevis 110 at the end 116 of presser rail 114 is generally circular in shape.

As best seen in Fig. 5, presser rail 114 is generally T-shaped. The presser rail 114 includes a pressing portion 126 and a connection portion 128. Pressing portion 126 has a lower surface 130 for engaging the scrap of material 133 and a pair of upper surfaces 132, 134 which engage lower surfaces 136 and 138, respectively, of clevis 110 when presser rail 114 is pivotally mounted to clevis 110. In the alternative, a rubber pad

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139, Figs. 9-10, may be affixed to lower surface 130 of presser rail 114. The rubber pad 139 includes a pressing surface 141 for engaging the scrap material and holding the scrap 133 between the pressing surface 141 and a frame 143.

5 In order to interconnect presser rail 114 to clevis 110, connection portion 128 is positioned between side walls 118 and 120. A pin 140 is slid through aperture 124 in each side wall 118, 120 of clevis 110 and through aperture 142 in connection portion 128 of presser rail 114. When first clevis
10 110 is interconnected to the connection portion 128 of presser rail 114, pin 140 in circular aperture 124 prevents horizontal movement of presser rail 114 with respect to guide cylinder 32. As best seen in Fig. 8, aperture 142 in connection portion 128 of presser rail 114 is circumferentially supported by insert 144 in
15 order to reinforce aperture 142. In order to prevent pin 140 from sliding through one or both of the side walls 118, 120, a lock ring 146, Figs. 5, 7 and 9, is placed in a groove 149, Fig. 2, on each end 148, 150 of pin 140. Lock ring 146 is generally circular in shape and has a small opening 151 at each end of a
20 wire-like body portion 153. The tips of a needle nose pliers may be inserted into openings 151 in order to separate ends 155, 157 of body portion 153 so as to allow lock ring 146 to be placed over ends 148, 150 of pin 140 and into grooves 149.

 In order to interconnect the remaining cylindrical guide
25 members 32 to presser rail 114, second clevis 112, Fig. 6, is used. Like first clevis 110, second clevis 112 is threaded onto end 106 of stem 92. Clevis 112 is identical to clevis 110 except that aperture 124 is replaced with an oblong opening 152 in each side wall 118, 120. Identical parts of clevises 110 and 112
30 will be identified by the same reference characters. Each oblong opening 152 is horizontally and vertically aligned with the other oblong opening 152 in the opposing side wall. Second clevis

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112 is connected by pin 140 and by lock ring 146 to presser rail 114 in the same manner as the first clevis 110 is connected to presser rail 114.

5 By placing an oblong opening 152 in the second clevis 112, pin 140 may slide horizontally in oblong opening 152 as each end 116, 154, of presser rail 114 moves vertically. As a result, ends 116, 154, of presser rail 114 may move vertically each in unison or independently of the opposite end of the presser rail 114. This, in turn, increases the flexibility of the
10 presser rail 114 when engaging a non-planar sheet of web material. As a result, the carton blanking scrap is more adequately supported when the blanks 160, Fig. 10, are knocked out of the large sheet of material. This, in turn, prevents the scrap 133 from jamming the blanking operation machinery.

15 Referring now to Figs. 11-13, there is shown a second embodiment of a presser assembly 200 of the present invention. As illustrated, the presser assembly 200 includes a housing 201, a reciprocating guide member 202, clevis 203 and presser rail 204 substantially identical to those components as previously
20 described therein. A stem 205 likewise extends through housing 201 and guide member 202 to be threadedly engaged at one end with clevis 203 and threadedly engaged at its other end with nuts 206 and 207 similarly as previously described herein with respect to the first embodiment. The operation of presser
25 assembly 200 is substantially identical to the operation of presser assembly 10 as previously described herein, and therefore will not be repeated.

30 As shown in Fig. 11, rail 204 is relatively short with the connection of clevis 203 via pin 208 located centrally between opposite ends of rail 204. Since only a single assembly 200 is being employed with rail 204, there is a possibility that guide member 202, clevis 203 and rail 204 will rotate with respect to housing 201 as guide member 202 reciprocates within housing

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201. In order to prevent the relative rotation of these components with respect to housing 201 there is incorporated an anti-rotation mechanism in presser assembly 200. As illustrated, this anti-rotation mechanism includes a plate 209
5 mounted to stem 205 by being sandwiched between nuts 206 and 207. The inner end of plate 209 includes an opening 210 through which stem 205 passes, and the outer projecting end of plate 209 includes a depending rod 211 extending downwardly therefrom. Rod 211 is positioned so that it is spaced slightly
10 outwardly from the outer surface of housing 201 to provide clearance therebetween, and to avoid any interference with housing 201. Rod 211 extends between a slot 212 formed in a yolk member 213 which in turn is integrally connected to the top of housing 201. Yolk 213 thus captures rod 211, and
15 prevents stem 205, guide member 202, clevis 203 and rail 204 from rotating with respect to housing 201.

The connection of rail 204 to clevis 203 includes a universal coupling connection having a compressible, resilient urethane connector 214 positioned between the top of rail 204
20 and clevis 203. Flexible connector 214 along with pin 208 provides a universal coupling which enables rail 204 to be flexible and self aligning with respect to the sheet material in the blanking operation. More specifically, the inherent resiliency of urethane connector 214 functions as a spring to
25 bias rail 204 away from clevis 203. This prevents excessive wear and stress on components particularly should the alignment of rail 204 upon engaging the sheet material be slightly off.

As shown best in Fig. 13, housing 201 also includes a vent hole 215 formed in its side wall. Vent hole 215 is located
30 above the top dead center position of guide member 202 and functions to relieve the vacuum formed within housing 201 when guide member 202 moves from a position within housing 201 to an extending position as shown in Fig. 11, i.e.

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downwardly out of housing 201. During this movement a vacuum forms within housing 201 which results in paper dust being sucked into housing 201, as housing 201 returns upwardly and guide member 201 moves downwardly. Normally, without vent
5 hole 215, paper dust would be drawn into housing 201 resulting in an abrasive action between the external surface of guide member 202 and the internal surface of housing 201. Vent hole 215 thus prevents damage between these two components.

As also best shown in Fig. 13, the top end of housing 201
10 includes a crowned surface 216. Crown surface 216 cushions the blow of housing 201 against rubber washer 217, as housing 201 reciprocates during the blanking operation. This prevents stem 205 from fracturing or breaking at its upper end.

Figs. 14 and 15 show an alternate means for connecting
15 rail 220 to clevis 221. In this embodiment, clevis 221 is composed of compressible, resilient urethane to reduce wear and stress on components. Clevis 221 has a slot 222 formed therein for slidably receiving rail 220. In cross section, slot 222 is substantially T-shaped as shown in Fig. 15. Slot 222 extends
20 the entire length of clevis 221 between front wall 223 and rear wall 224 with the shank of the T opening to lower edge 225 of clevis 221 and the head of the T contained within the body of clevis 221. In longitudinal section, as shown in Fig. 14, slot 222 is shaped like a venturi having a central flat section 226
25 extending approximately 1/4 inch in length, a tapered front section 227 and a tapered rear section 228. The walls of sections 227 and 228 are tapered at approximately 5° from flat section 226 to front wall 223 and rear wall 224 respectively. This taper, in combination with the resilient urethane material
30 of clevis 221, enables rail 220 to be self aligning with respect to

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the sheet material in the blanking operation and further prevents excessive wear and stress on components, particularly should the alignment of rail 220 upon engaging the sheet material be slightly off.

5 As shown best in Fig. 15, rail 220 is substantially I-shaped in cross section. The head 229 of rail 220 is slightly smaller than pressing portion 230. Head 229 is slidably receiving within slot 222 so that lower edge 225 of clevis 221 is slightly spaced above top edge 231 of pressing portion 230.
10 This enables rail 220 to pivot or "rock" up and down (as seen in Fig. 14) to compensate for minor misalignment between the rail 220 and sheet material, as referred to above.

 A pin 232 holds rail 220 on clevis 221. Pin 232 is received within aligned openings 233 and 234 in clevis 221 and
15 rail 220 respectively, and extends through the lower yoke portion 235 of clevis 221 and web portion 236 of rail 220. Pin 232 is I-shaped and includes a urethane bushing 237 surrounding the central portion of pin 232. Bushing 237 cushions the blow between clevis 221, rail 220 and pin 232 to
20 prevent excessive wear and stress on these components. Opposite ends of pin 232 are flush with the opposite exterior surfaces of clevis 221. A clip 238 holds pin 232 in clevis 221. Clip 238 includes a U-shaped body 239 which extends over the head 229 of rail 220 and has opposite legs 240 located on either
25 side of head 229 and web portion 236. Legs 240 are spaced apart such that when clip 238 is positioned on yoke 235 they provide a spring force clamping clip 238 on clevis 221. A pair of ears 242, 243 project from the edges of legs 240, and cover the opposite ends of pin 232 to prevent pin 232 from sliding out of
30 openings 233 and 234. Alternately, pin 232 could be manufactured slightly longer to extend or project from opposite sides of clevis 221 in which case cotter pins could be used to hold pin 232 in position.

1. A presser assembly (32) for supporting carton blanking scrap (133), comprising:

a hollow housing (34) including a cavity (40) formed there-through defining an open top and an open bottom;

5 a longitudinally extending stem (92) slidably received within said cavity (40) for reciprocal movement therein and having an upper end (96) projecting from said open top and a lower end (106) projecting from said open bottom;

a presser rail (114);

10 connector means (110, 112, 140, 146) for connecting the lower end of said stem (92) to said presser rail (114);

bias means (94) for biasing said presser rail (114) away from said housing (34);

15 stop means (100, 102, 104) at the upper end (96) of said stem (92) engagable with said housing (34) for limiting the movement of said rail (114) away from said housing (34); and

20 a guide member (78) surrounding said stem (92) and received within the open bottom of said cavity (40) in telescoping relation with said housing (34) for guiding said presser rail (114) during its vertical reciprocating movement.

2. The presser assembly (32) of claim 1 further including an anti-rotation mechanism (209, 211, 213) for preventing the relative rotation between said presser rail (114) and said housing (34).

3. The presser assembly (32) of claim 2 wherein said anti-rotation mechanism includes a yoke member (213) on said housing (34) and a rod (211) connected to said stem (92), said yoke member (213) including a slot (212) for receiving and capturing said rod (211) therein.

4. The presser assembly (32) of claim 1 wherein said connector means includes a universal coupling (214) to provide a flexible connection between said presser rail (114) and stem (92).

5. The presser assembly (32) of claim 4 wherein said connector means includes a clevis (203), and said universal coupling includes spring means (214) for biasing said rail (204) away from said clevis (203).

6. The presser assembly (32) of claim 5 wherein said spring means includes a resilient pad (214) disposed between said clevis (203) and said presser rail (204).

7. The presser assembly (32) of claim 1 further including a vent hole (215) in said housing (34) communicating between said cavity (40) and atmosphere.

8. The presser assembly (32) of claim 1 wherein said stop means includes a rubber washer (217), and said housing (34) includes a crowned surface (216) surrounding said open top end engagable with said washer (217) during reciprocal movement of said presser rail (114).

9. The presser assembly (32) of claim 5 further including means (140, 146, 238) for mounting the clevis (203) on the presser rail (114).

10. The presser assembly (32) of claim 9 wherein said means for mounting the clevis on the presser rail (114) includes a pin (140) extending through the clevis (203) and rail (114), and means (146, 238) for retaining the pin (140).

11. The presser assembly (32) of claim 10 wherein said pin retaining means comprises a snap ring (146).

12. The presser assembly (32) of claim 10 wherein said pin retaining means comprises a clip (238).

13. The presser assembly (32) of claim 1 wherein said connector means includes a clevis (110, 112) having a slot formed therein for receiving said presser rail (114) and mounting means (140, 146) for mounting the clevis (110, 112) on the presser rail (114), and further including cushioning means (237) between said mounting means and said presser rail (114).

14. The presser assembly (32) of claim 13 wherein said mounting means comprises a pin (140) extending through the clevis (110, 112) and presser rail (114), and said cushioning means comprises a bushing (237) composed of resilient material surrounding at least a portion of said pin (140).

15. The presser assembly (32) of claim 14 wherein said resilient material is urethane.

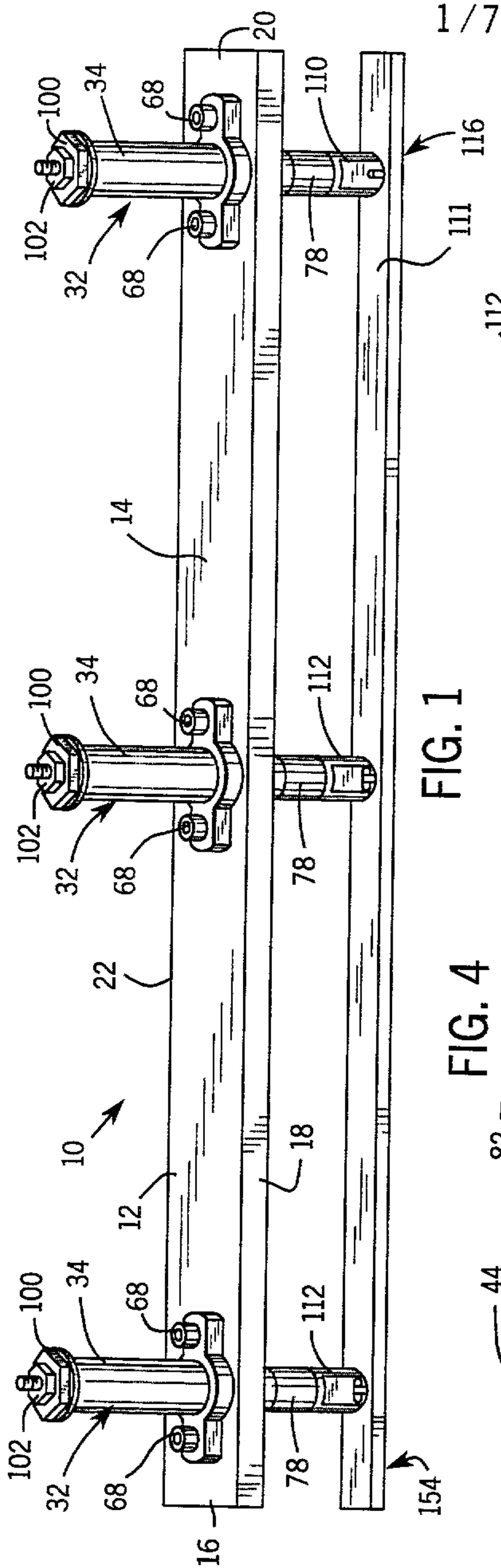
16. The presser assembly (32) of claim 4 wherein said connector means includes a clevis (221) having a slot formed therein for receiving said presser rail (220) and mounting means for mounting the clevis (221) on the presser rail (220), and said universal coupling includes said slot being venturi-shaped (226, 227, 228) having a central constricted section (226) and opposite outwardly tapered front (227) and rear (228) end sections.

17. The presser assembly (32) of claim 16 wherein the taper of said end sections (227, 228) is about 5°.

18. The presser assembly (32) of claim 16 wherein said clevis (221) is composed of a resilient material.

19. The presser assembly (32) of claim 18 wherein said resilient material is urethane.

20. The presser assembly (32) of claim 1 wherein said connector means includes a clevis (112) having opposite side walls defining a slot for receiving said presser rail (114) and mounting means (140, 146, 152) for mounting the clevis (112) on the presser rail (114), said mounting means comprising aligned oblong openings (152) in said opposite side walls, a pin (140) extending through each oblong opening (152) and retaining means (146) for retaining the pin (140) in said openings (152).



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FIG. 1

FIG. 4

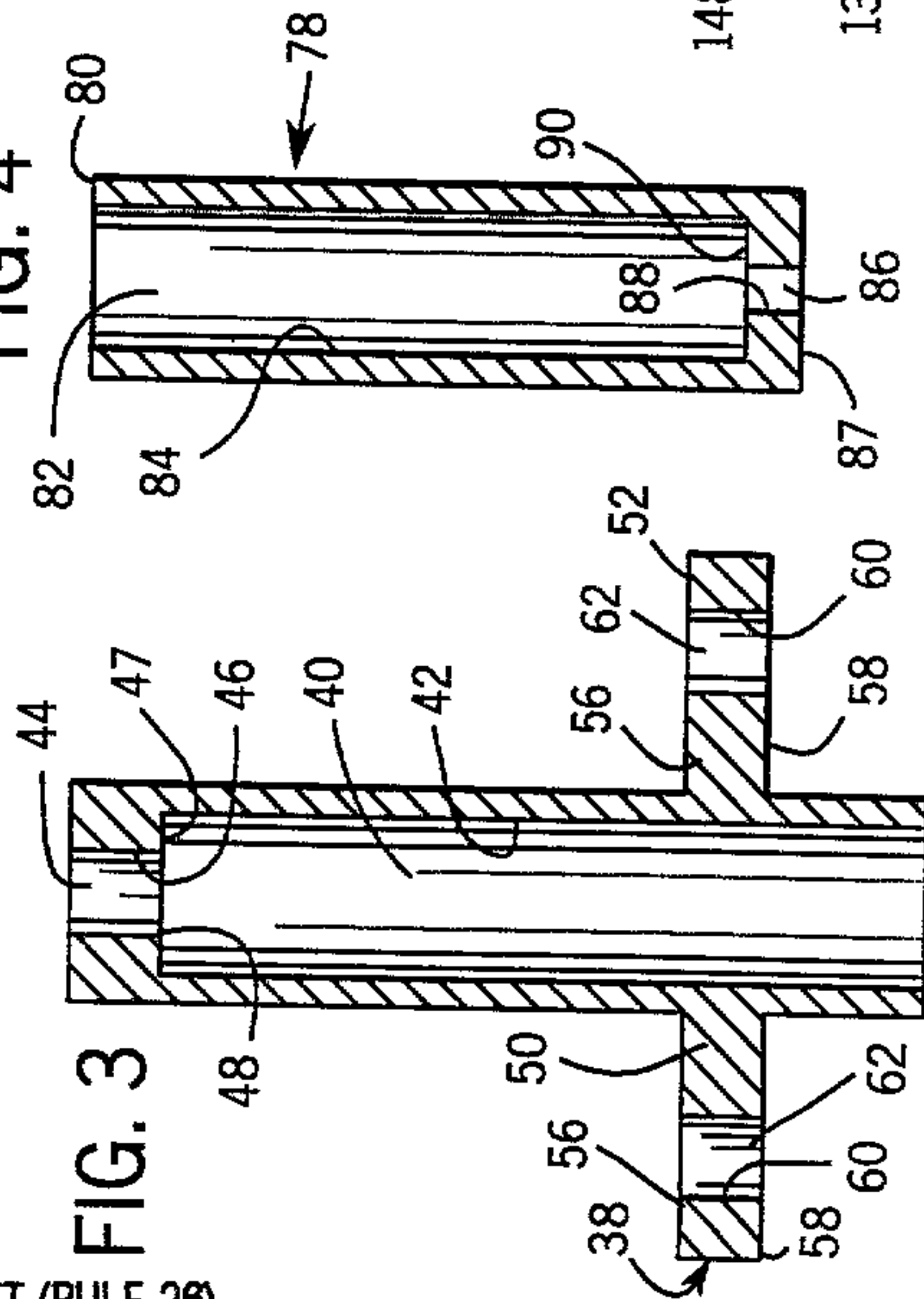


FIG. 5

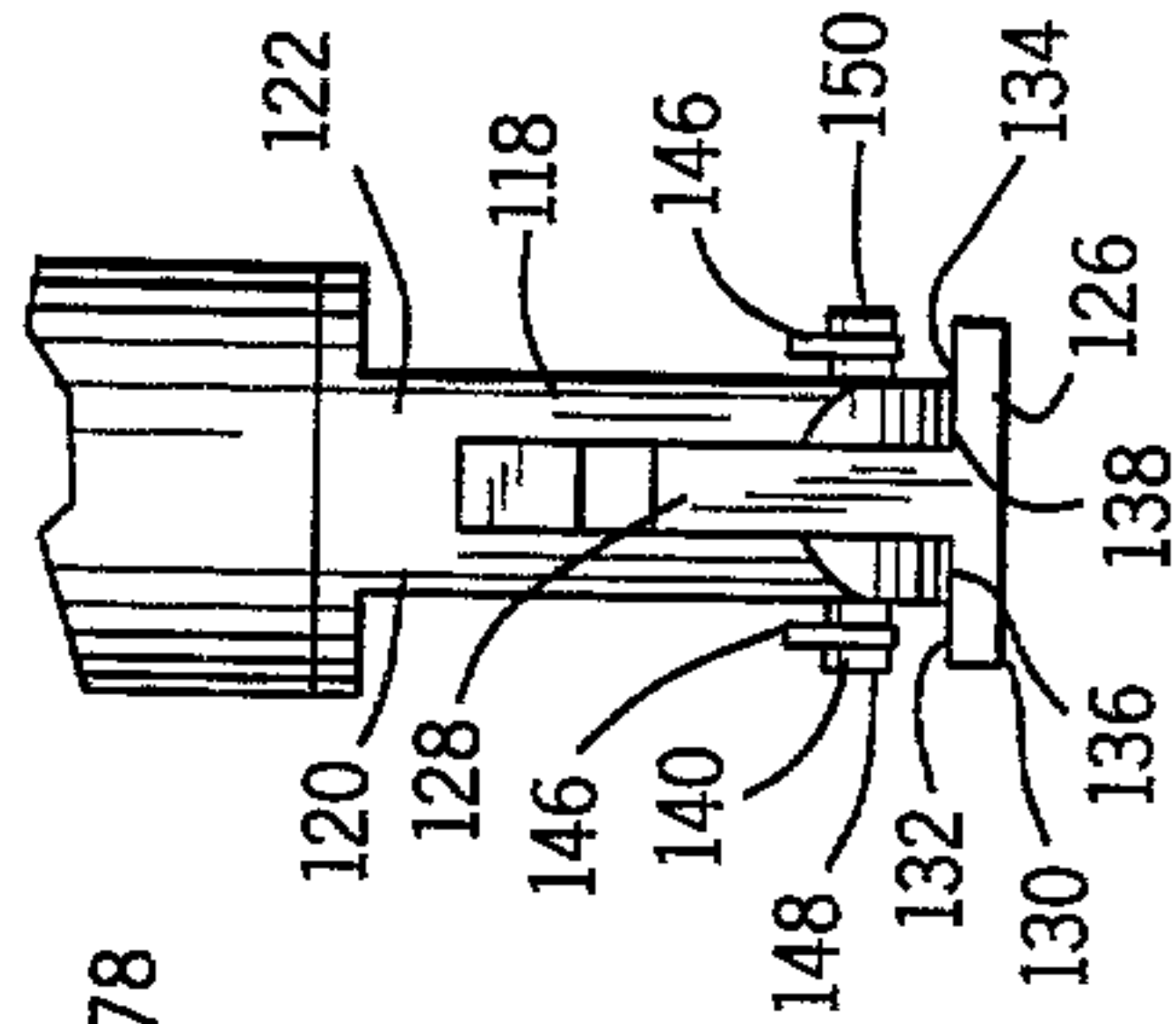


FIG. 6

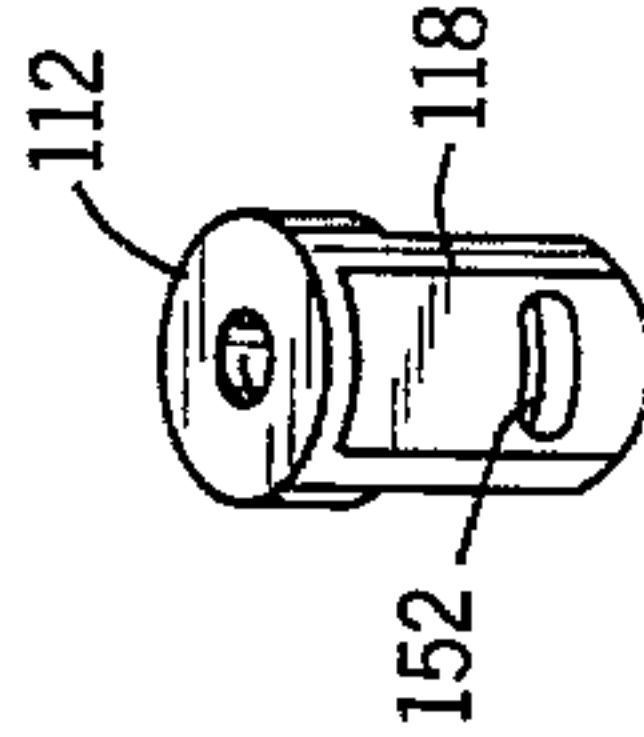


FIG. 8

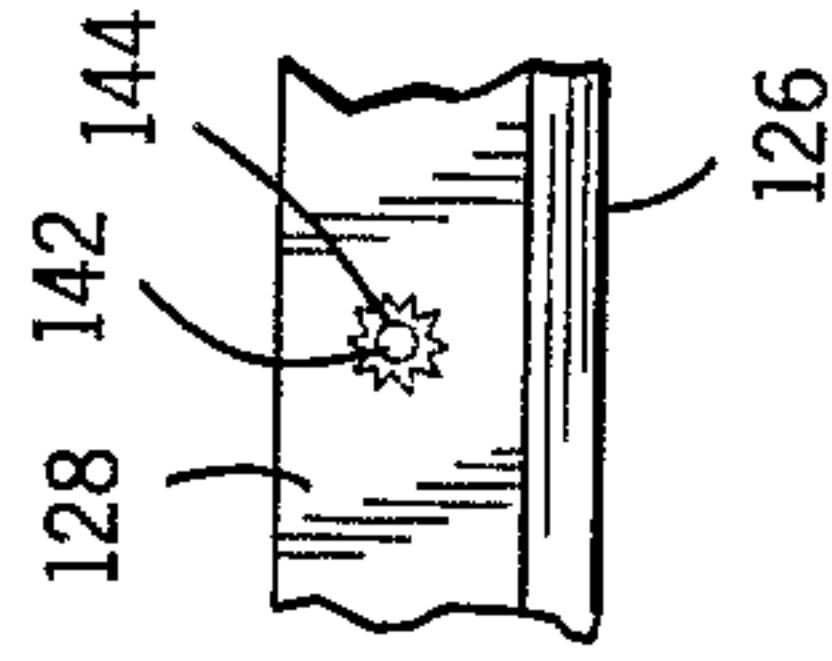
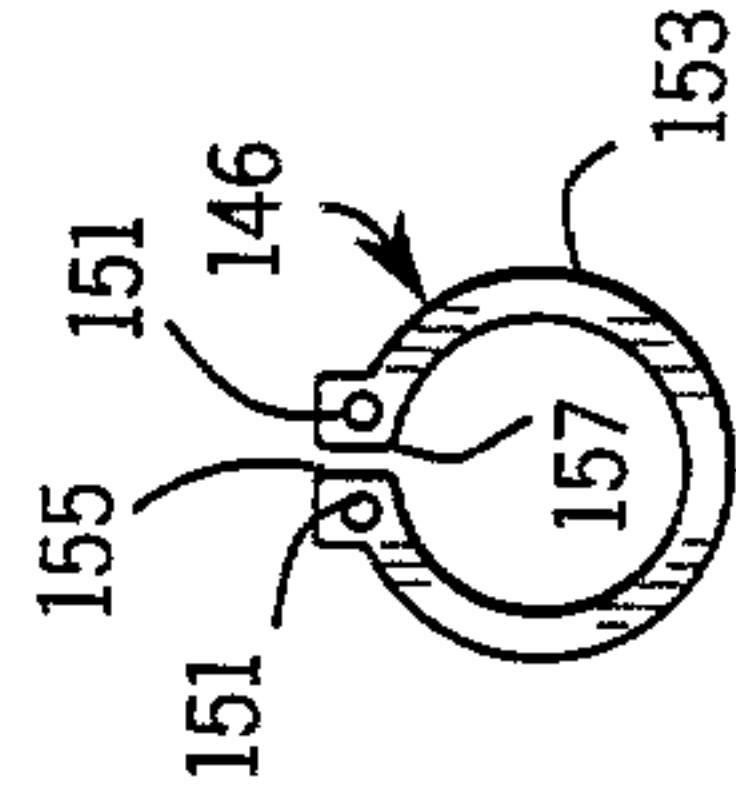


FIG. 7



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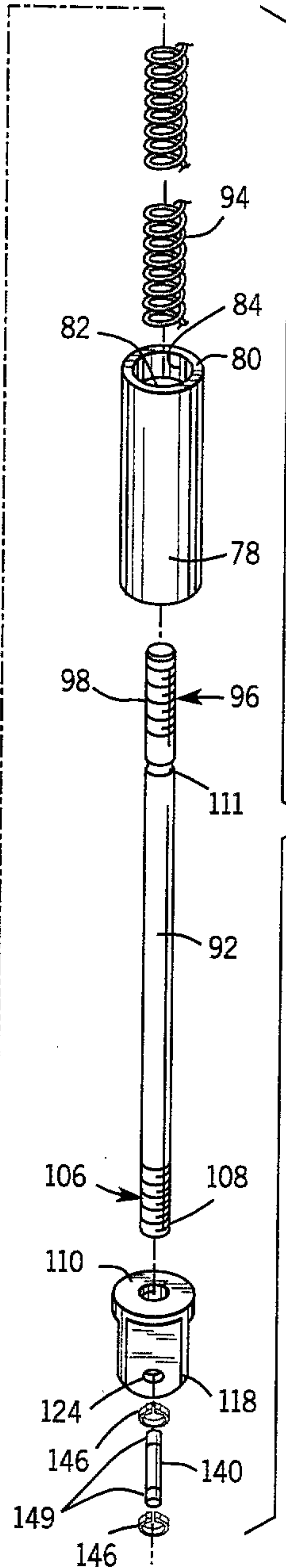
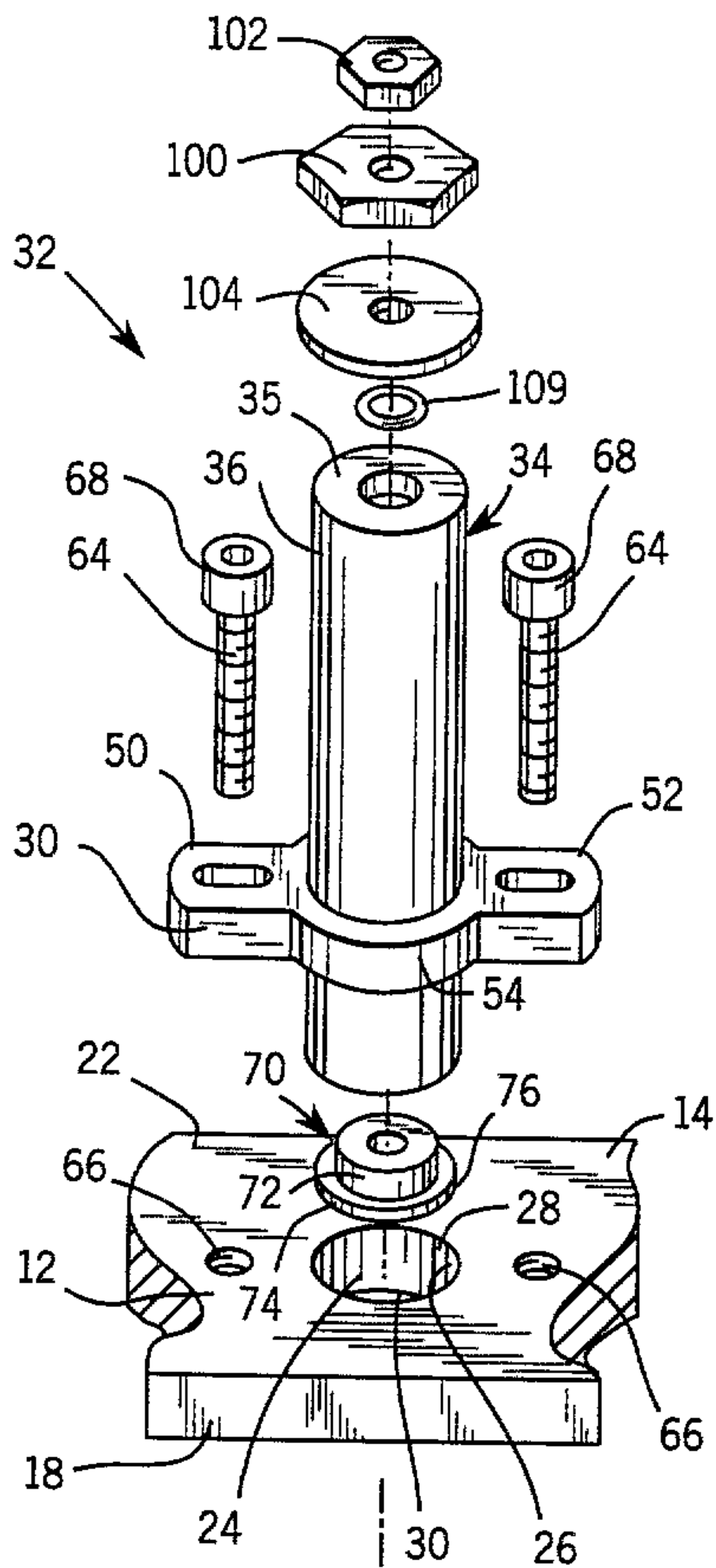
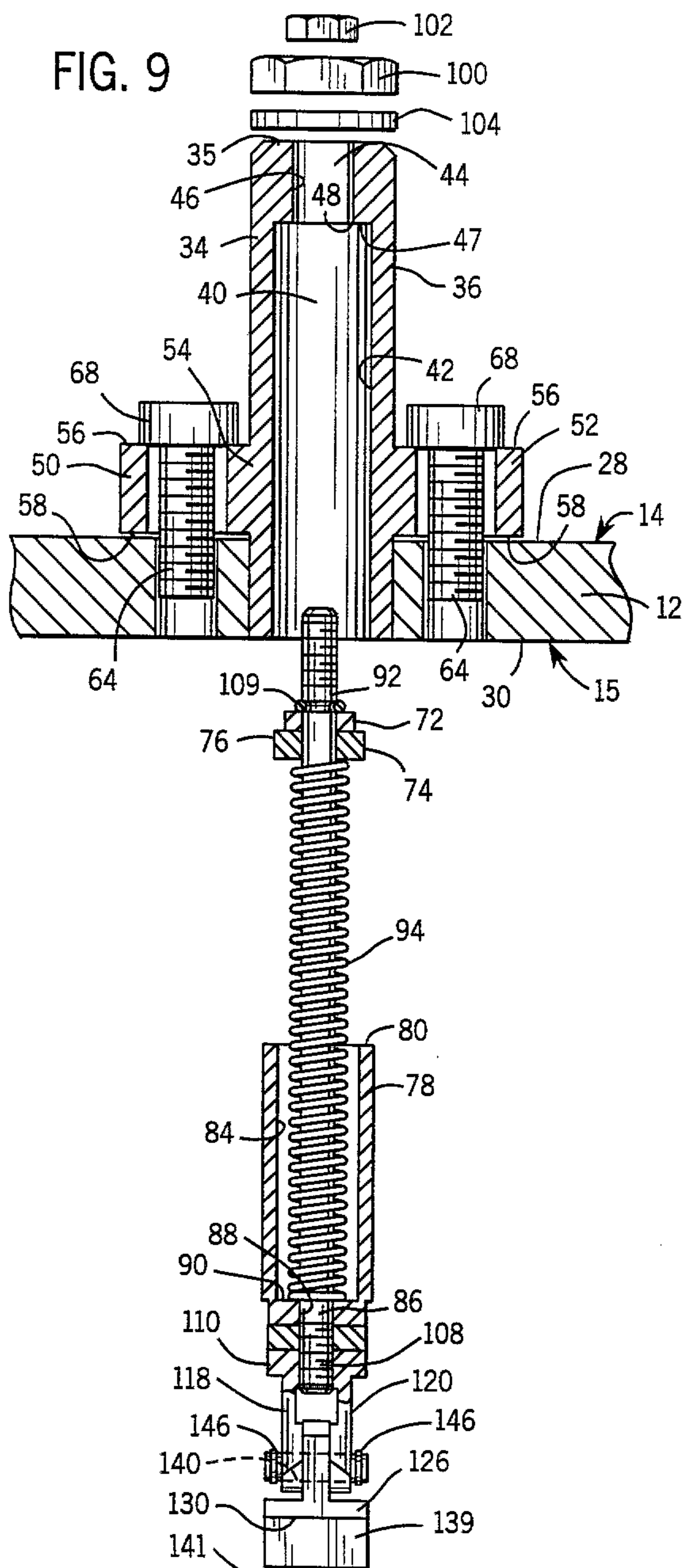


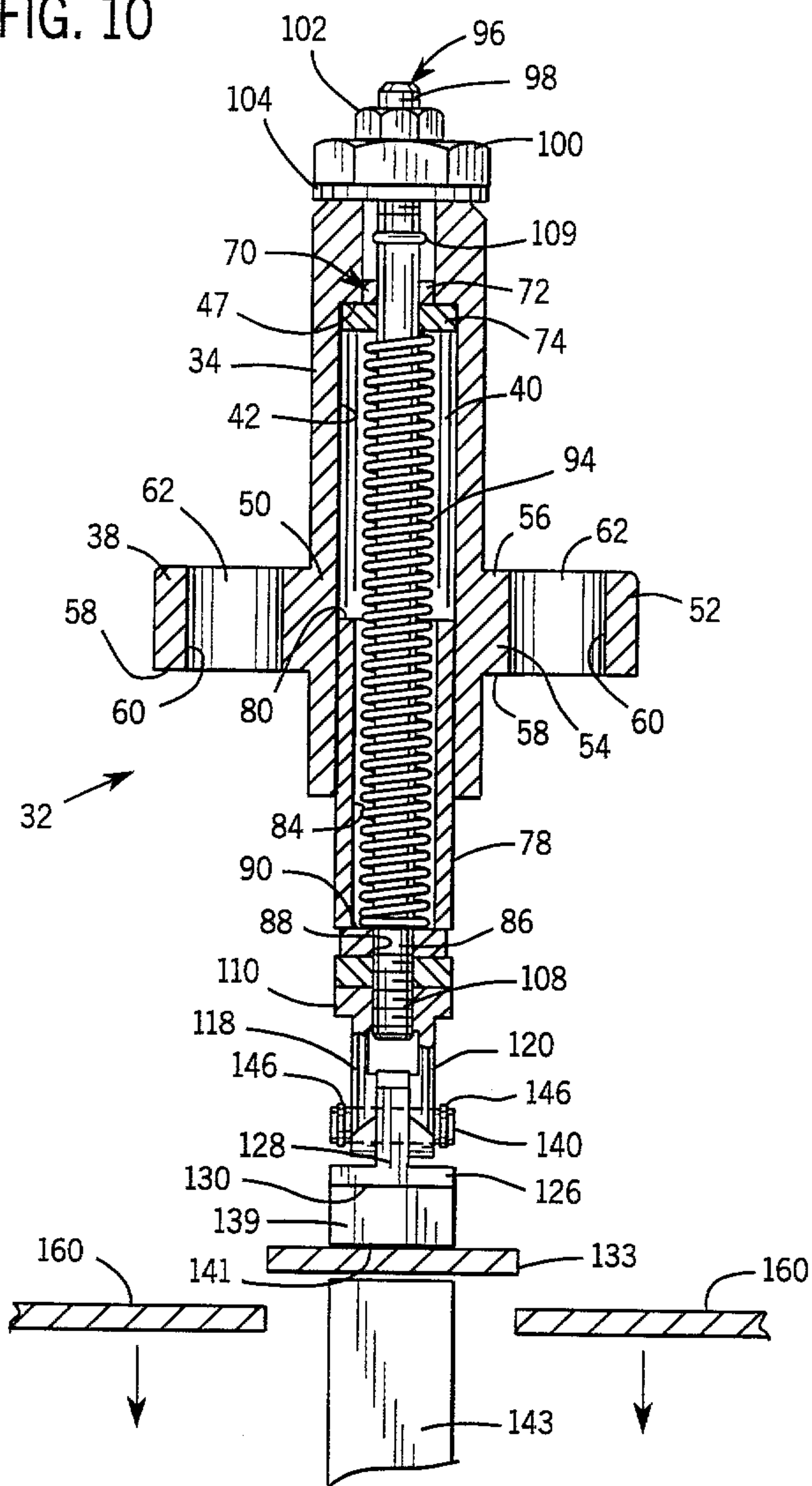
FIG. 2



SUBSTITUTE SHEET (RULE 26)

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FIG. 10



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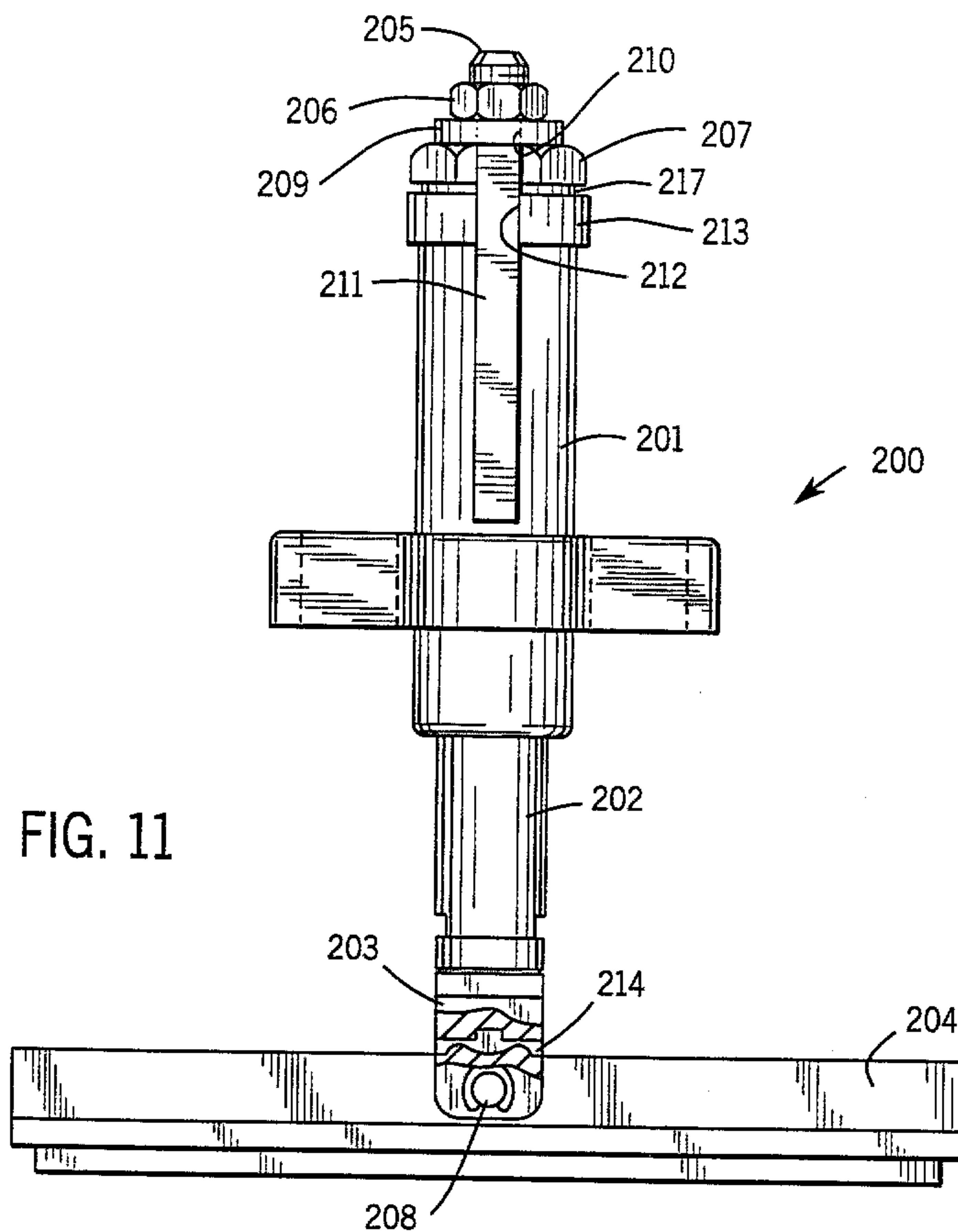


FIG. 12

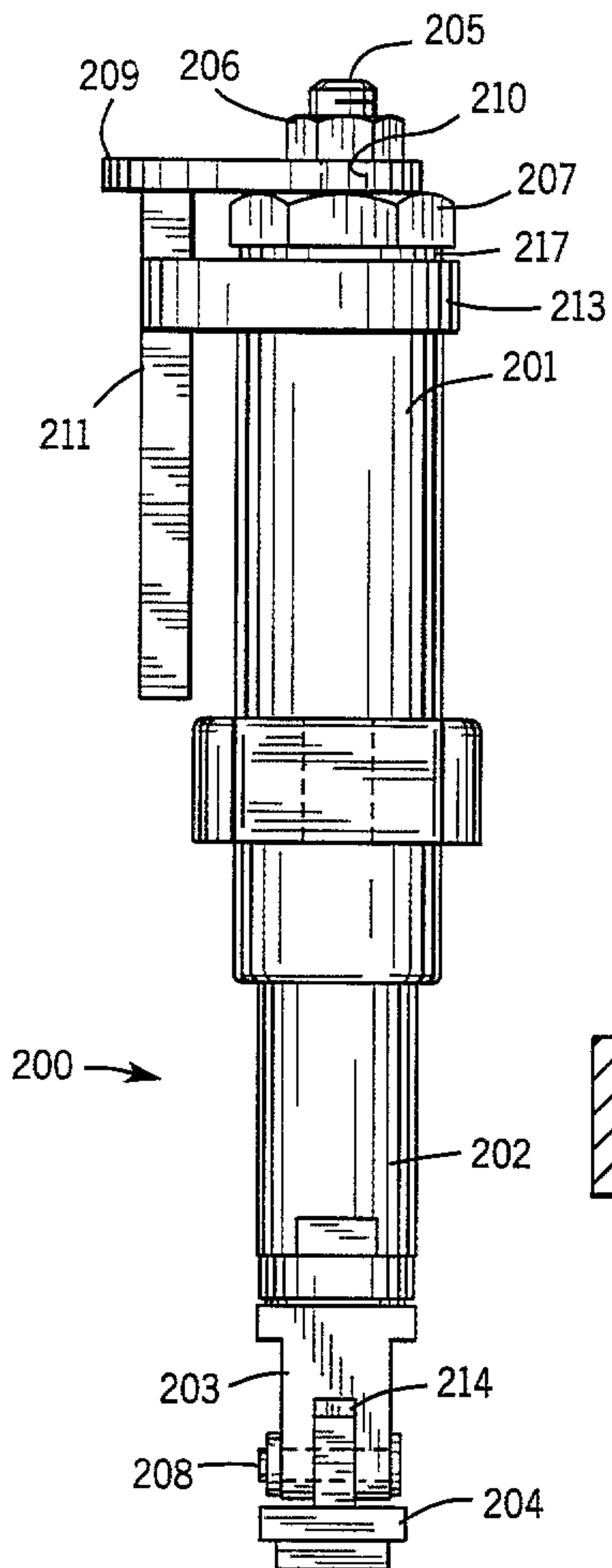
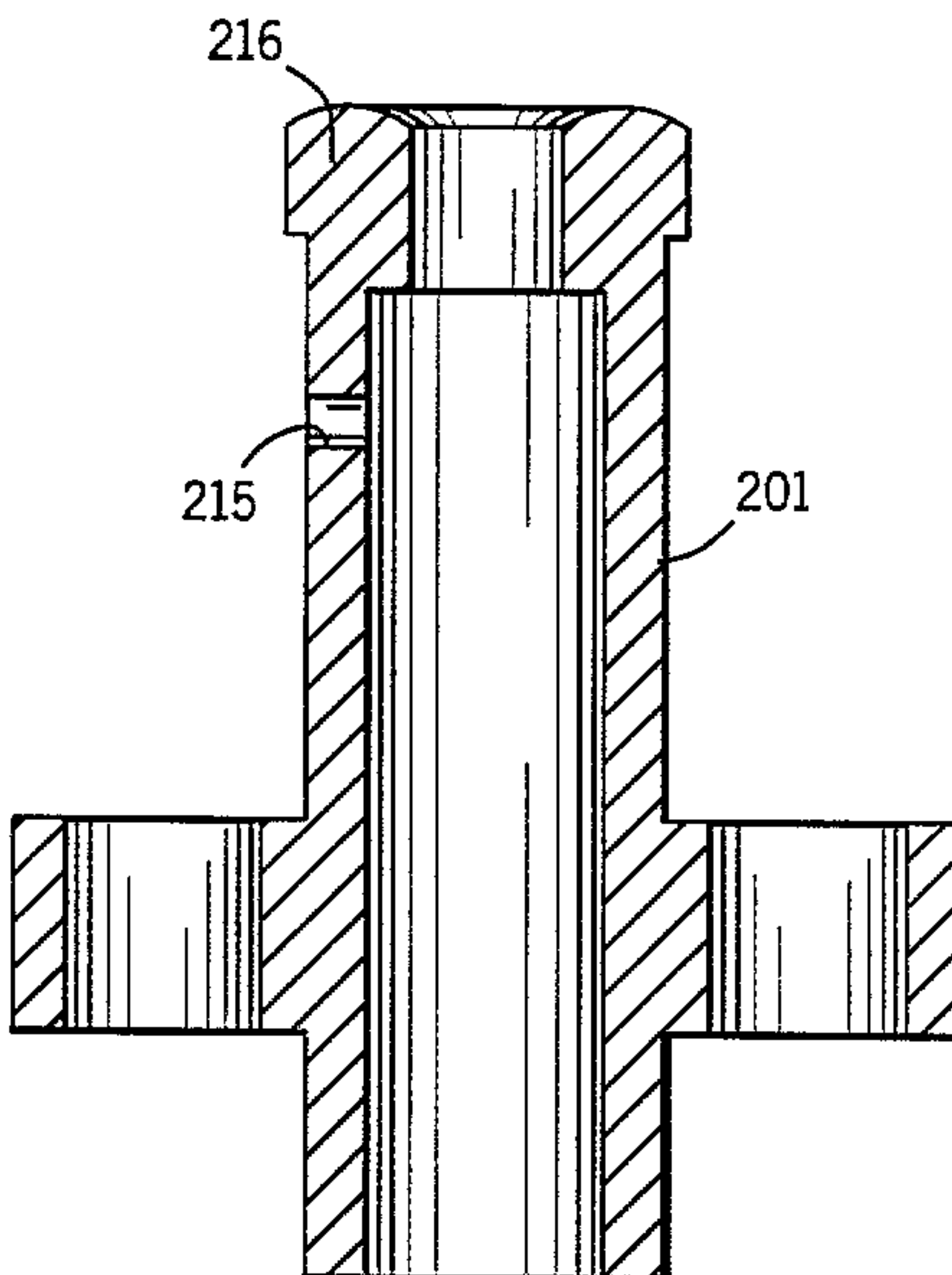


FIG. 13



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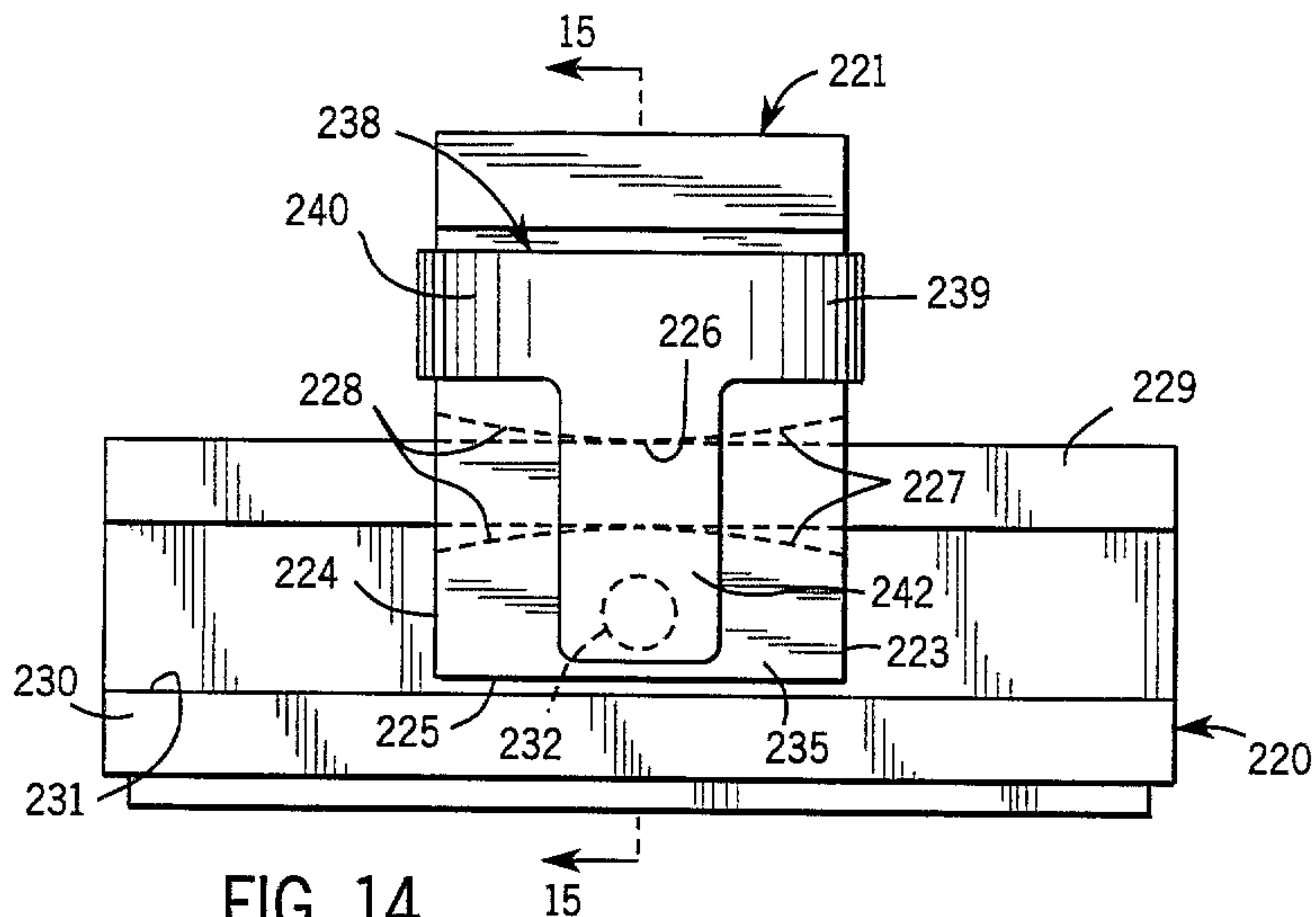
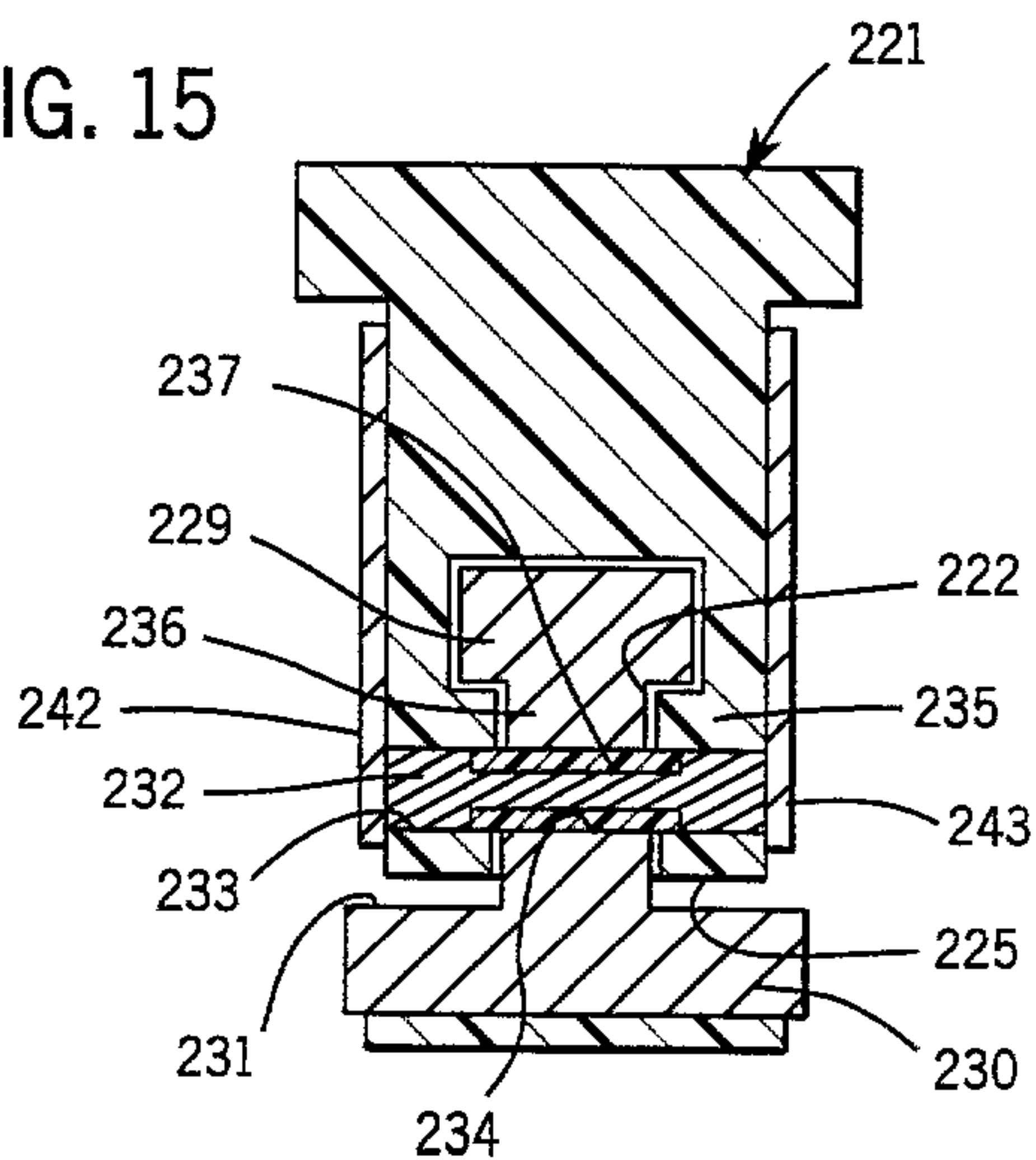


FIG. 15



SUBSTITUTE SHEET (RULE 26)

