(19) Europäisches Patentamt
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(11) **EP 1 946 680 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
23.07.2008 Bulletin 2008/30

(51) Int Cl.:
A47F 3/00 *(2006.01)*

(21) Application number: **07254680.7**

(22) Date of filing: **03.12.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **19.01.2007 US 624991**

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(54) Hinge pivot arm for a glass-front merchandiser

(57) A glass-front merchandiser that includes a case. The case includes a base that has a forward portion and a rear portion. The merchandiser further includes an upper case frame, a glass member, and at least one pivot arm. The upper case frame is coupled to the rear portion of the base and extends substantially above a product display area defined by the case. The glass member includes an upper edge portion that defines an axis of curvature and a lower edge portion that is supported by the forward portion. The at least one pivot arm includes a first end that is pivotally coupled to the upper case frame, and a second end that is disposed at an oblique angle from the first end. The second end is coupled to the upper edge portion of the glass member substantially orthogonal to the axis of curvature.

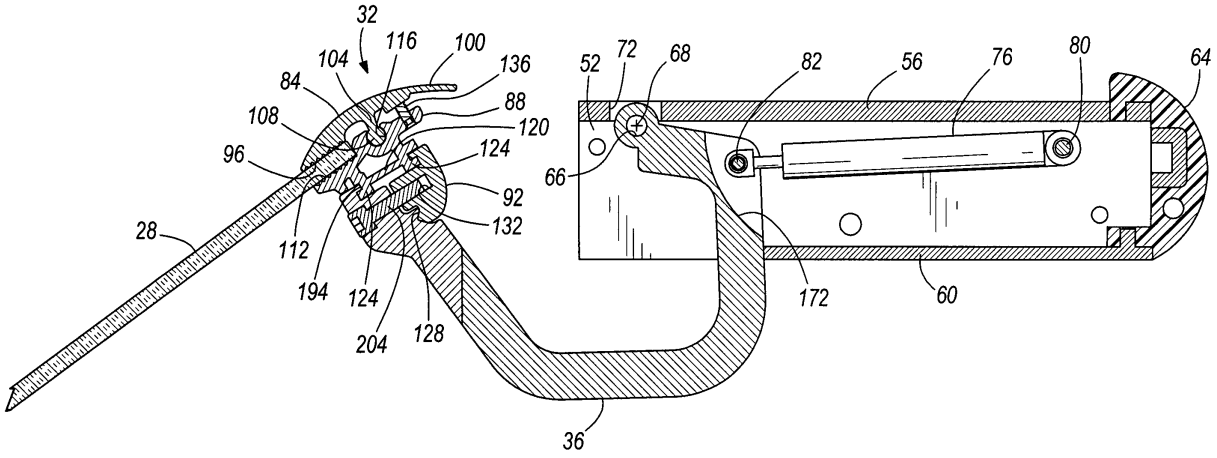

FIG. 3

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Description

BACKGROUND

[0001] The present invention relates to a glass-front display merchandiser. More particularly, the invention relates to a pivot arm for a glass-front display merchandiser with conical or spherical glass.

[0002] Glass-front display merchandisers, sometimes referred to as deli or service merchandisers, are generally assembled from aligned modular sections or cases. The modular cases typically include straight cases of variable lengths (e.g., 4, 6, 8, 10, or 12 feet long) and inside and outside wedge cases of variable arc length (e.g., 45 and 90 degrees). The different modular cases can be aligned end to end and assembled to form a linear merchandiser or a merchandiser having a customized shape, such as a 90 degree corner, a bump out, an inlet, or an S-curve.

[0003] Typically, in display merchandisers that include a customized shape, the glass fronts of the straight cases can use "straight" or "curved glass" panes, and the glass fronts of the wedge cases can use "conical glass" panes or "spherical glass" panes. Curved glass refers to glass panes that are curved when viewed in a vertical cross-section, and that are flat when viewed in a horizontal cross-section. Conical glass panes refer to glass panes that are curved when viewed in a horizontal cross-section, and that are flat when viewed in a vertical cross-section. Spherical glass is curved in both the horizontal and vertical cross-sections. When a straight case with curved glass is assembled together with a wedge case having spherical glass, the adjacent ends of the spherical and curved glass panes are aligned with each other along a curved path to provide the illusion of a single seamless customized merchandiser. When a straight case with straight glass is assembled together with a wedge case having conical glass, the adjacent ends of the conical glass and the straight glass panes are aligned with each other along a straight path.

[0004] In some cases, the top edge portion of the glass pane is clamped by a clamp assembly through which the glass pane is pivotally attached to an upper edge portion of the case. Generally, the case includes an upper case frame or case top, which is connected to the rear portion of the case by struts. The clamp assembly for straight or curved glass panes includes clamp hardware coupled to one or more straight hinge pivot arms to allow pivotal movement of the straight or curved glass panes. However, these straight hinge pivot arms cannot attach to conical or spherical glass panes without specialized clamp assemblies to secure these glass panes to the straight hinge pivot arms.

SUMMARY

[0005] In one embodiment, the invention provides a glass-front merchandiser that includes a case. The case includes a base that has a forward portion and a rear portion. The merchandiser further includes an upper case frame, a glass member, and at least one pivot arm. The upper case frame is coupled to the rear portion of the base and extends substantially above a product display area defined by the case. The glass member includes an upper edge portion that defines an axis of curvature and a lower edge portion that is supported by the forward portion. The at least one pivot arm includes a first end that is pivotally coupled to the upper case frame, and a second end that is disposed at an oblique angle from the first end. The second end is coupled to the upper edge portion of the glass member substantially orthogonal to the axis of curvature.

[0006] In another embodiment, the invention provides a glass-front merchandiser that includes a case. The case includes a base that has a forward portion and a rear portion. The merchandiser further includes an upper case frame, a glass member, and at least one pivot arm. The upper case frame is coupled to the rear portion of the base and extends substantially above a product display area defined by the case. The glass member includes an upper edge portion located adjacent the upper case frame and that defines an axis of curvature, and a lower edge portion that is supported by the forward portion. The merchandiser further includes a first pivot arm and a second pivot arm. Each of the first pivot arm and the second pivot arm includes a first end that is pivotally coupled to the first support member, and a second end that is coupled to the upper edge portion of the glass member. The second end of the second pivot arm is disposed at an oblique angle from the first end of the second pivot arm, and is further disposed at an oblique angle from the second end of the first pivot arm.

[0007] Other aspects of the invention will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a perspective view of a glass-front wedge-style merchandiser that includes a glass clamp assembly and a conical glass pane.

[0009] Fig. 2 is a top view of the glass clamp assembly and the conical glass pane of Fig. 1.

[0010] Fig. 3 is a section view of the glass clamp assembly and a portion of the conical glass pane of Fig. 2, taken along line 3-3.

[0011] Fig. 4 is a front view of a hinge pivot arm of the glass clamp assembly of Fig. 3.

[0012] Fig. 5 is a top view of the hinge pivot arm of Fig. 4.

[0013] Fig. 6 is a front view of another pivot arm of the glass clamp assembly of Fig. 3.

[0014] Fig. 7 is a top view of the pivot arm of Fig. 6.

[0015] Fig. 8 is a perspective view of another glass-front wedge-style merchandiser that includes glass clamp hardware and a spherical glass pane.

[0016] Fig. 9 is a top view of the glass clamp hardware and the spherical glass pane of Fig. 8.

[0017] Fig. 10 is a section view of the glass clamp hardware and a portion of the spherical glass pane of Fig. 9, taken along line 10-10.

DETAILED DESCRIPTION

[0018] Before any embodiments of the invention are explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The invention is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including," "comprising," or "having" and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Unless specified or limited otherwise, the terms "mounted," "connected," "supported," and "coupled" and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings. Further, "connected" and "coupled" are not restricted to physical or mechanical connections or couplings.

[0019] Fig. 1 illustrates a display merchandiser 10 for displaying food product available to consumers in a retail setting (e.g., a supermarket or grocery store). The display merchandiser 10 includes an outside wedge-style display case 12 that is generally defined by an outward curvature, and that defines a product display area 14 for storing the food product.

[0020] The case 12 includes a base 16 that supports the case 12 on a surface (not shown) of the retail setting, and elevates the product display area 14 for easy viewing by consumers. The base 16 includes a front portion 18 that partially defines the product display area 14, and a rear portion 20 that extends substantially above the product display area 14. In some embodiments, the case 12 is a refrigerated display case, and the base 16 encloses at least a portion of a refrigeration system (not shown) that refrigerates the food product. In other embodiments, the case 12 can be a dry case or a hot case, and the base 16 can enclose at least a portion of an air circulation system or heating system (not shown), respectively.

[0021] The case 12 further includes an upper case frame 24 and a glass member 28 coupled to the upper case frame 24 with glass clamp hardware 32, a first pivot arm 36, and a second pivot arm 40 (Fig. 2). The upper case frame 24 is coupled to the rear portion 20, and includes struts 44 and support members 48. The struts 44 extend upward from the rear portion 20 over the product display area 14 and attach to the support members 48. The struts 44 are spaced apart from each other to define access openings that allow food product to be transferred into and out of the product display area 14. The illustrated embodiment of the case 12 shows two struts 44. However, other embodiments of the case 12 may include one or more than two struts 44.

[0022] Fig. 3 shows that each support member 48 includes sidewalls 52 (one shown), an upper wall 56, and a lower wall 60 that cooperate to define a hollow cavity. A cap 64 is positioned on an end of each support member 48 to partially enclose the hollow cavity. Each of the sidewalls 52 includes a hole 66 that defines a pivot axis 68 (Fig. 2).

[0023] The upper wall 56 extends the length of the support member 48, and includes an aperture 72. The lower wall 60 extends from a rear of the support member 48 away from the cap 64 toward an end of the support member 48. The lower wall 60 illustrated in Fig. 3 does not extend the full length of the support member 48.

[0024] A gas spring 76 is positioned within the hollow cavity of each support member 48. A first end of the gas spring 76 is pivotally coupled to the sidewalls 52 by a first pin 80. A second end of the gas spring 76 extends away from the cap 64 to couple to the first pivot arm 36 with a second pin 82. A similar arrangement is used to couple a gas spring (not shown) between the support member 48 and the second pivot arm 40.

[0025] The glass member 28 illustrated in Figs. 1-3 is a conical glass pane that is defined by a curvature substantially matching the curvature of the outside-wedge case 12. With reference to Fig. 2, the conically-shaped glass member 28 includes curved top and bottom edges when viewed in a horizontal cross-section. With reference to Fig. 3, the conically-shaped glass member 28 is straight when viewed in a vertical cross-section (i.e., no curvature). In other words, the glass member 28 is conically-shaped as if cut from a cone pointing in an upward direction. In some embodiments, the lower edge portion of the glass member 28 may be covered with a hard silicone trim piece (not shown) to assist with resting the glass member 28 against the base 16.

[0026] Fig. 1 shows that the glass member 28 includes a lower edge portion that is supported by the front portion 18, and an upper edge portion that is adjacent the upper case frame 24 and coupled to the clamp hardware 32. As shown in Fig. 2, the upper edge portion of the conical glass member 28 includes a curved edge that defines an axis of curvature 42. The axis of curvature 42 defines an arc that varies based on the curvature of the case 12.

[0027] As shown in Fig. 3, the clamp hardware 32 and the first and second pivot arms 36, 40 are positioned between the upper case frame 24 and the glass member 28 to allow movement of the glass member 28 between an open position and a closed position. The clamp hardware 32 includes a first clamp 84, a second clamp 88, and third clamps 92. The first clamp 84 is a curved extrusion that extends along a substantial length of the glass member 28 (Figs. 1 and 2), and that substantially corresponds to the axis of curvature 42 (Fig. 2). The first clamp 84 includes a ridged surface 96, an extension 100,

and a post 104. The ridged surface 96 is coupled to an upper side of the glass member 28 when the case 12 is fully assembled. The extension 100 extends toward the upper case frame 24 to at least partially cover a gap between the upper case frame 24 and the clamp hardware 32. The post 104 extends generally downward from a center of the first clamp 84 toward the second clamp 88, and an end of the post 104 is defined by a ball-shaped member 108.

[0028] The second clamp 88 is defined by a curved extrusion that extends along a substantial length of the glass member 28, and that substantially corresponds to the axis of curvature 42. The second clamp 88 includes a ridged surface 112, a recess or groove 116, and a lower portion 120. The ridged surface 112 is coupled to a lower side of the glass member 28 when the case 12 is fully assembled. The groove 116 is disposed along a substantial length of the second clamp 88, and is defined by a substantially cylindrical wall or socket that receives the ball-shaped member 108. The lower portion 120 includes "L"-shaped protrusions 124 that define elongated and opposed slots.

[0029] The third clamps 92 are separate pieces, with one third clamp 92 coupled to a respective pivot arm 36, 40. In other words, a first third clamp 92 is associated with the first pivot arm 36, and a second third clamp 92 is associated with the second pivot arm 40. Each third clamp 92 is coupled to one of the slots defined by the "L"-shaped protrusions 124, and includes a recess 128 and a hole 132 that extends into a side of the third clamp 92.

[0030] A screw 136 is passed upward through the second clamp 88 to engage a rearward end of the first clamp 84 opposite the ridged surface 96. The screw 136 is a set screw that can be tightened or loosened to vary the space between the ridged surfaces 96, 112 based on the thickness of the glass member 28. For example, in embodiments of the case 12 that include a relatively thin glass member 28, the screw 136 can be tightened to decrease the space between the ridged surface 96 and the ridged surface 112. In embodiments of the case 12 that include a relatively thick glass member 28, the screw 136 may extend partially through the second clamp 88 to increase the space between the ridged surface 96 and the ridged surface 112. In other embodiments, a spacer may be disposed between the first clamp 84 and the second clamp 88 to secure the glass member 28 between the ridged surfaces 96, 112.

[0031] The glass member 28 is pivotally attached to the upper case frame 24 by the first and second pivot arms 36, 40. As shown in Figs. 3-7, the first pivot arm 36 and the second pivot arm 40 are each defined by a substantially "U"-shaped body.

[0032] As shown in Figs. 3-5, the first pivot arm 36 includes a first end 144 and a second end 148. The first end 144 is partially inserted into the aperture 72, and defines a first axis 152 that is substantially perpendicular to the pivot axis 68 (Fig. 2). The first end 144 includes a hole 156 and a pivot portion 160. A pin (not shown) is passed through the hole 156 and the holes 66 in the sidewalls 52 to pivotally attach the first end 144 to one of the support members 48.

[0033] The pivot portion 160 includes two walls 168, an arcuate channel 172 defined by the walls 168, and a hole 176 extending through each of the walls 168. The second end of the gas spring 76 is coupled to the pivot portion 160 within the arcuate channel 172 and secured to the walls 168 with the pin 82.

[0034] The second end 148 defines a second axis 184 that is at an oblique angle 188 to the first axis 152. In some embodiments, the second end 148 is bent with respect to the first end 144. In the illustrated embodiment, the oblique angle 188 is about 10 degrees. However, the angle 188 may be any angle between 0 degrees and 360 degrees, and is determined by the axis of curvature 42.

[0035] The second end 148 includes an engagement portion 192 and a protrusion 196. The engagement portion 192 is defined by an "L"-shaped protrusion 194 that engages one of the slots defined by the "L"-shaped protrusions 124 of the lower portion 120. The protrusion 196 is configured to engage the recess 128 of the third clamp 92. A hole 200 extends through the second end below the engagement portion 192, and a fastener 204 (e.g., bolt, screw, pin, etc.) is passed through the hole 200 to attach the first pivot arm 36 to the third clamp 92.

[0036] Figs. 6 and 7 show the second pivot arm 40 that includes a first end 208 and a second end 212. The first end 208 of the second pivot arm 40 is similar to the first end 144 of the first pivot arm 36. The first end 208 defines a third axis 216 that is substantially perpendicular to the pivot axis 68 (Fig. 2), and includes a hole 220 and a pivot portion 224. A pin (not shown) is passed through the hole 220 and the holes 66 in the sidewalls 52 to pivotally attach the first end 208 to one of the support members 48.

[0037] The pivot portion 224 includes two walls 232, an arcuate channel 236 defined by the walls 232, and a hole 240 extending through each of the walls 232. The second end of the gas spring 76 is coupled to the pivot portion 224 within the arcuate channel 236 and secured to the walls 232 with a pin similar to the pin 82.

[0038] The second end 212 of the second pivot arm 40 defines a fourth axis 248 that is disposed at an oblique angle 252 to the third axis 216. In some embodiments, the second end 212 is bent with respect to the first end 208. In the illustrated embodiment, the oblique angle 252 is about 10 degrees. However, the angle 252 may be any angle between 0 degrees and 90 degrees, and is determined by the axis of curvature 42.

[0039] As shown in Fig. 2, when the merchandiser 10 is assembled the second end 212 of the second pivot arm 40 is further disposed at an oblique angle 256 with respect to the second end 148 of the first pivot arm 36. In other words, the fourth axis 248 is at the oblique angle 256 with respect to the second axis 184 such that the fourth axis 248 is not parallel to either the second axis 184 or the third axis 216.

[0040] The second end 212 includes an engagement portion 264 that is defined by an "L"-shaped protrusion 266 that engages one of the slots of the "L"-shaped protrusions 124. The second end 212 also includes a protrusion 268 that is substantially engaged with the recess 128 of the third clamp 92. Similar to the second end 148, a fastener similar to the fastener 204 is passed through a hole 272 in the second end 212 to attach the second pivot arm 40 to the third clamp 92.

[0041] As shown in Fig. 2, the bent second end 212 of the second pivot arm 40 bends in a direction that is opposite the direction of the bent second end 148 of the first pivot arm 36. As such, the first pivot arm 36 defines a "left-hand" pivot arm, and the second pivot arm 40 defines a "right-hand" pivot arm. The respective bent second ends 148, 212 attach different portions of the clamp 92 to the glass member 28 substantially orthogonally to the axis of curvature 42.

[0042] Fig. 8 shows another embodiment of a display merchandiser 310 that includes an inside wedge-style display case 312 that is generally defined by an inward curvature. The case 312 includes a product display area 314 for storing food product. Except as described below, the case 312 is similar to the case 12 described with regard to Figs. 1-7.

[0043] The case includes a base 316, an upper case frame 320, and a glass member 324. The base 316 includes a front portion 328 and a rear portion 332. The base 316 and the upper case frame 320 generally differ from the base 16 and the upper case frame 24 with regard to the curvature of the front and rear portions 328, 332, and the curvature of the upper case frame 320.

[0044] The glass member 324 illustrated in Figs. 8-10 is a spherical glass pane. The spherically-shaped glass member 324 is defined by a curvature that substantially matches the contour of the inside-wedge case 312. With reference to Fig. 9, the spherically-shaped glass member 324 includes a curved upper edge portion and a curved lower edge portion when viewed in a horizontal cross-section. With reference to Fig. 10, the spherically-shaped glass member 324 is curved when viewed in a vertical cross-section. The upper edge portion of the spherical glass member 324 defines an axis of curvature 336. Due to the curvature of the case 312, the axis of curvature 336 is curved in a direction that is opposite the curvature of the axis of curvature 42.

[0045] Figs. 8-10 show the glass member 324 coupled to the upper case frame 320 by glass clamp hardware 340 that includes the first pivot arm 36, the second pivot arm 40, a first clamp 344, a second clamp 348, and a third clamp 352. The first and second clamps 344, 348 are similar to the first and second clamps 84, 88 of the clamp hardware 32 described with regard to Figs. 1-3, and are curved to match the axis of curvature 336. The first and second clamps 344, 348 generally differ from the first and second clamps 84, 88 with respect to the direction of curvature of the glass member 324. The third clamp 352 is the same as the third clamp 92. As such, the clamp hardware 340 will not be discussed in detail.

[0046] The first and second pivot arms 36, 40 pivotally attach the glass member 324 to the upper case frame 320. The attachment of the first and second pivot arms 36, 40 to the upper case frame 320 on the inside-wedge case 312 (Fig. 9) is reversed from the attachment of the first and second pivot arms 36, 40 to the upper case frame 24 on the outside-wedge case 12 (Fig. 2). In other words, the second ends 148, 212 are angled outward (i.e., defining the angle 256 between the second ends 148, 212) and symmetrical about an axis of symmetry 356 in the case 12 illustrated in Fig. 2, and the second ends 148, 212 are angled inward (i.e., defining an angle 360 between the second ends 148, 212) and symmetrical about the axis 356 in the case 312 illustrated in Fig. 9. Thus, the pivot arms 36, 40 can be used interchangeably to pivotally attach glass members 28, 324 with different axes of curvature 42, 336 to the upper case frames 24, 320.

[0047] Due to the similarities between the case 12 and the case 312, only the operation of the case 12 will be described in detail. In operation, the glass member 28 is pivotally attached to the case 12 using the clamp hardware 32. The clamp hardware 32 is attached to the first and second pivot arms 36, 40 by first pivotably securing the first clamp 84 to the second clamp 88, and then sliding the lower edge portion of the second clamp 88 into the engagement portions 192, 264 of the first and second pivot arms 36, 40, respectively. The third clamp 92 is engaged with the lower edge portion 128 and secured to the engagement portions 192, 264 with the fasteners 204.

[0048] The bent second ends 148, 212 attach to the clamp hardware 32 substantially orthogonal to the axis of curvature 42. Once the clamp hardware 32 is secured to the first and second pivot arms 36, 40, the glass member 28 is inserted between the first clamp 84 and the second clamp 88. The screw 136 is tightened to pivot the first clamp 84 in the groove 116 so that the ridged surfaces 96, 112 secure the glass member 28 between the first and second clamps 84,88.

[0049] The glass member 28 is pivotable between the open position and the closed position using the clamp first and second pivot arms 36, 40. In the closed position, the lower edge portion of the glass member 28 is supported by the front portion 18, and the clamp hardware 32 and the first and second pivot arms are in the position shown in Fig. 3. The glass member 28 may be moved to the open position by lifting the glass member 28 from the front portion 18, and pivoting the glass member 28 about the pivot axis 68.

[0050] The gas springs 76 assist pivotal movement of the glass member 28 between the open and closed positions by exerting a force on each of the first and second pivot arms 36, 40. More specifically, the force of the gas springs 76 against the pivot portions 160, 224 cause the first and second pivot arms 36, 40 to pivot in tandem about the pivot axis 68. As the glass member 28 rotates upward, the first and second pivot arms 36, 40 freely

rotate about the pivot axis 68 without impeding the upper case frame 24 and the glass member 28.

[0051] The glass member 28 is moved to the closed position by pivoting the glass member 28 generally downward about the pivot axis 68. The first and second pivot arms 36, 40 freely rotate about the pivot axis 68 without impeding the upper case frame 24 and the glass member 28. As the glass member 28 pivots downward, the gas springs 76 are compressed, providing a controlled closing process for the glass member 28.

[0052] Various features and advantages of the invention are set forth in the following claims.

Claims

1. A glass-front merchandiser comprising:

a case defining a product display area and including a base having a forward portion and a rear portion;
an upper case frame coupled to the rear portion of the base and configured to extend substantially above the product display area;
a glass member including an upper edge portion defining an axis of curvature, and a lower edge portion supported by the forward portion; and
at least one pivot arm including a first end pivotally coupled to the upper case frame and a second end disposed at an oblique angle to the first end, the second end coupled to the upper edge portion of the glass member substantially orthogonal to the axis of curvature.

2. The glass-front merchandiser of claim 1, further comprising a clamp assembly coupled to the second end of the pivot arm to couple the glass member to the pivot arm.

3. The glass-front merchandiser of claim 2, wherein the clamp assembly includes a first clamp and a second clamp to receive the glass member, and wherein the pivot arm is configured to attach to the second clamp.

4. The glass-front merchandiser of claim 1, wherein the glass member is defined by one of conical glass and spherical glass.

5. The glass-front merchandiser of claim 1, wherein the upper case frame includes at least one support member having an hole defining an axis, and wherein the first end of the pivot arm is coupled to the hole to rotate the glass member about the axis.

6. The glass-front merchandiser of claim 5, wherein the pivot arm is defined by a substantially U-shaped body configured to freely rotate about the axis without impeding the upper case frame and the glass member.

7. The glass-front merchandiser of claim 1, wherein the upper case frame defines a first axis, and wherein the first end of the pivot arm defines a second axis and the second end of the pivot arm defines a third axis, and wherein the second axis is substantially perpendicular to the first axis.

8. The glass-front merchandiser of claim 7, wherein the third axis is at an oblique angle to the second axis and an axis of symmetry.

9. The glass-front merchandiser of claim 1, wherein the pivot arm includes a bent end.

10. A glass-front merchandiser comprising:

a case defining a product display area and including a base having a forward portion and a rear portion;
an upper case frame coupled to the rear portion of the base and configured to extend substantially above the product display area, the upper case frame including a first support member and a second support member spaced apart from the first support member;
a glass member including an upper edge portion adjacent the upper case frame defining an axis of curvature, and a lower edge portion supported by the forward portion;
a first pivot arm and a second pivot arm, each of the first pivot arm and the second pivot arm including a first end pivotally coupled to one of the first support member and the second support member, and a second end coupled to the upper edge portion of the glass member, the second end of the second pivot arm disposed at a first oblique angle from the first end of the second pivot arm, and disposed at a second oblique angle from the second end of the first pivot arm.

11. The glass-front merchandiser of claim 10, wherein the first pivot arm and the second pivot arm are each configured to couple to the glass member substantially orthogonal to the axis of curvature of the glass member.

12. The glass-front merchandiser of claim 11, wherein the second end of the first pivot arm and the second pivot arm is each disposed orthogonal to the axis of curvature of the glass member.

13. The glass-front merchandiser of claim 10, wherein the glass member is defined by one of conical glass and spherical glass.

14. The glass-front merchandiser of claim 10, wherein

the first support member and the second support member each include a hole defining a first axis, and wherein the first pivot arm and the second pivot arm are configured to pivot the glass member about the first axis.

15. The glass-front merchandiser of claim 14, wherein each of the first pivot arm and the second pivot arm include a substantially U-shaped body configured to freely rotate about the corresponding first and second axis without impeding the upper case frame and the glass member.

16. The glass-front merchandiser of claim 10, further comprising clamp hardware including a first clamp and a second clamp coupled to the first clamp to retain the upper edge portion of the glass member.

17. The glass-front merchandiser of claim 16, wherein the first pivot arm and the second pivot arm are configured to attach to the second clamp substantially orthogonal to the axis of curvature.

18. The glass-front merchandiser of claim 16, wherein each of the first clamp assembly and the second clamp assembly further includes a third clamp to secure the second clamp to the respective first pivot arm and the second pivot arm.

19. The glass-front merchandiser of claim 10, wherein each of the first pivot arm and the second pivot arm includes a bent end.

20. The glass-front merchandiser of claim 10, wherein the first pivot arm defines a left-hand pivot arm and the second pivot arm defines a right-hand pivot arm.

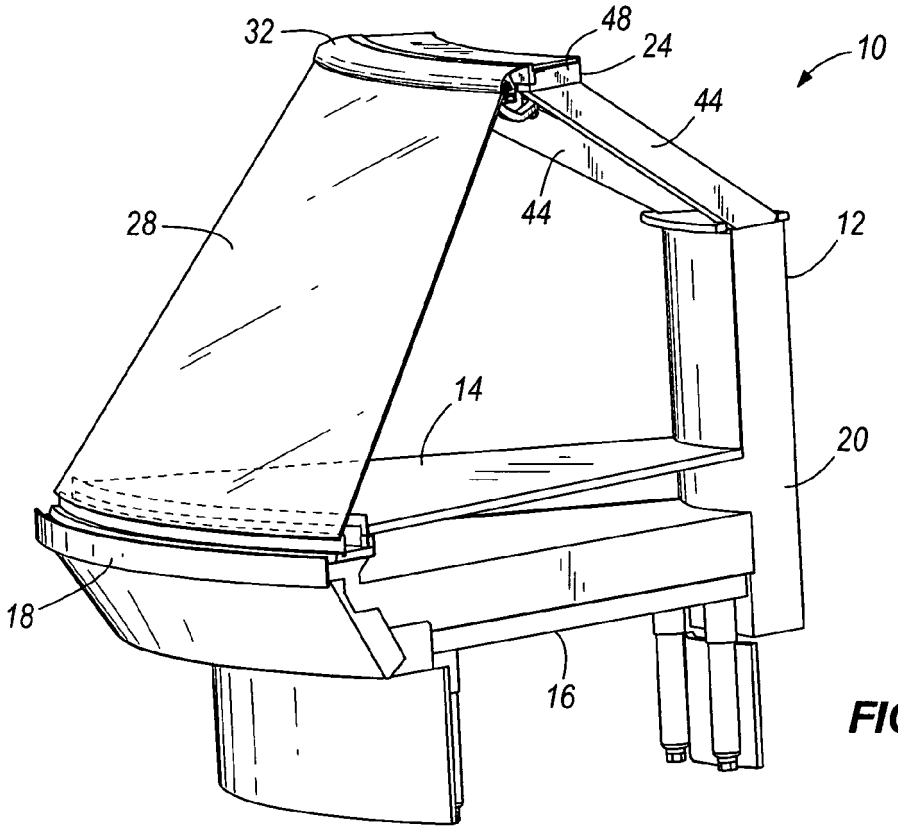
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FIG. 1

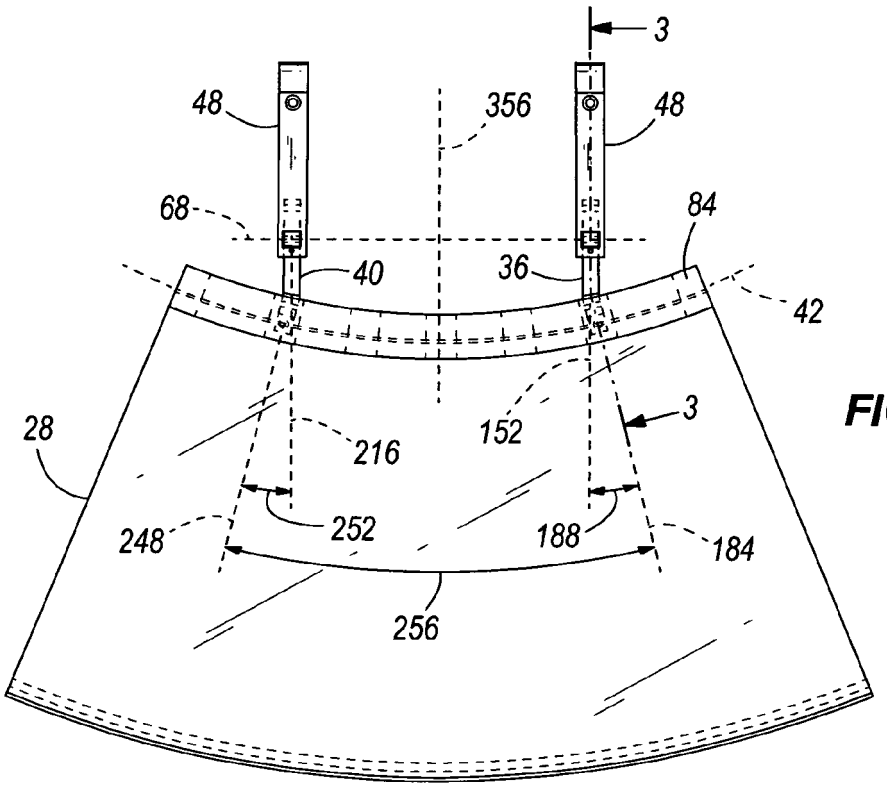
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FIG. 2

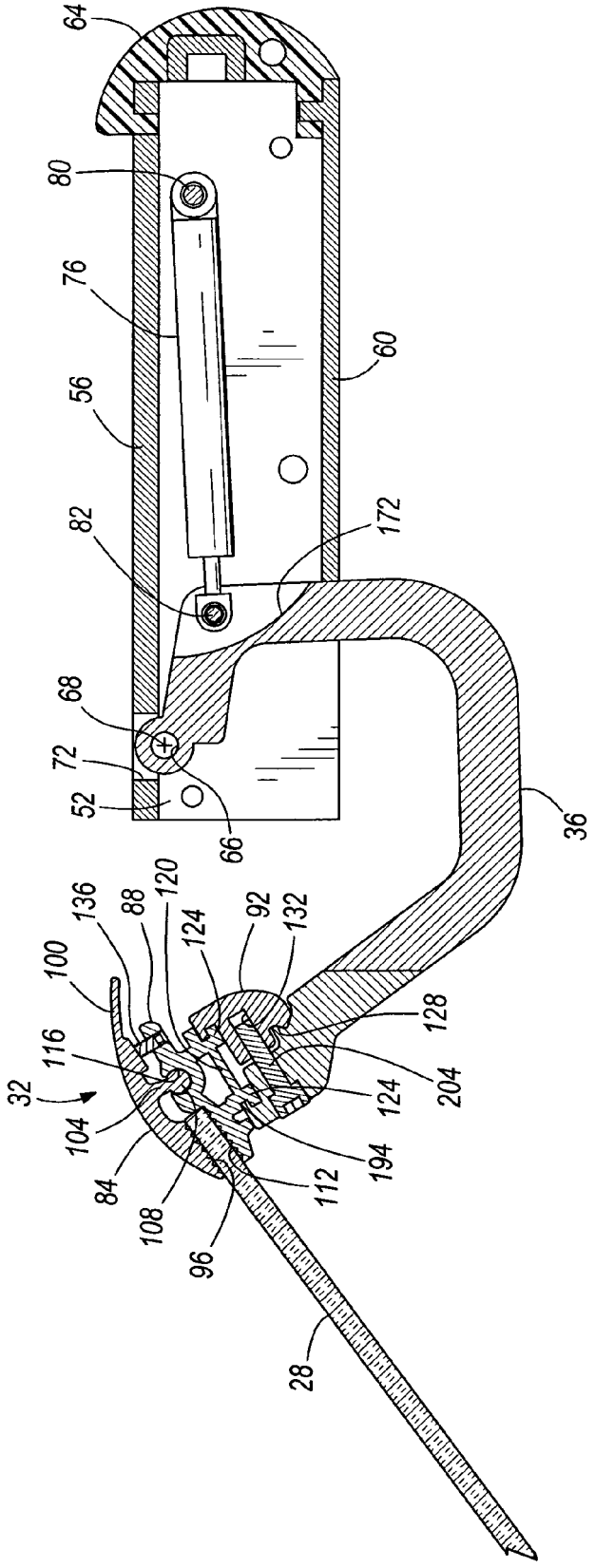
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FIG. 3

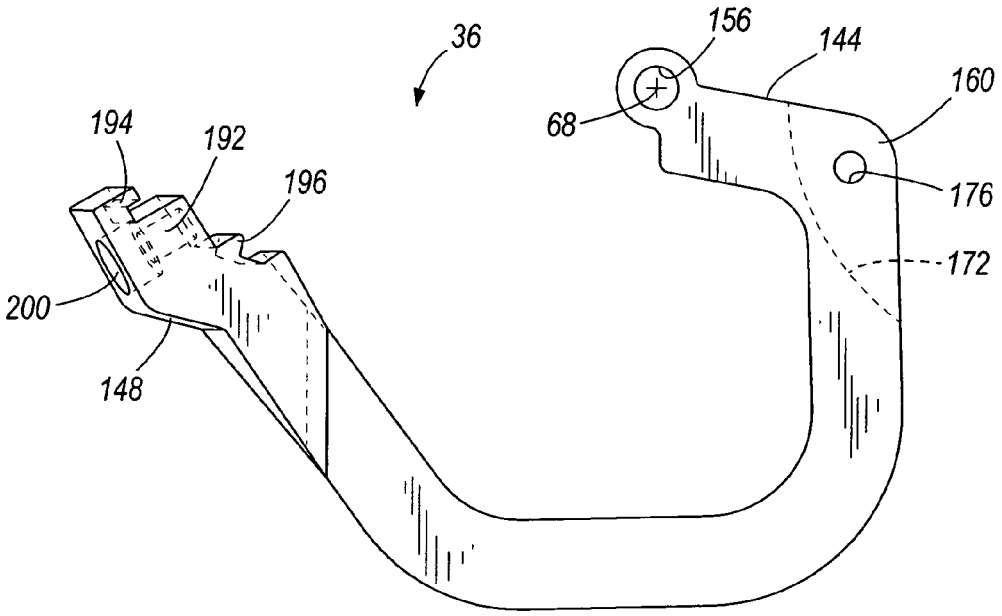
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FIG. 4

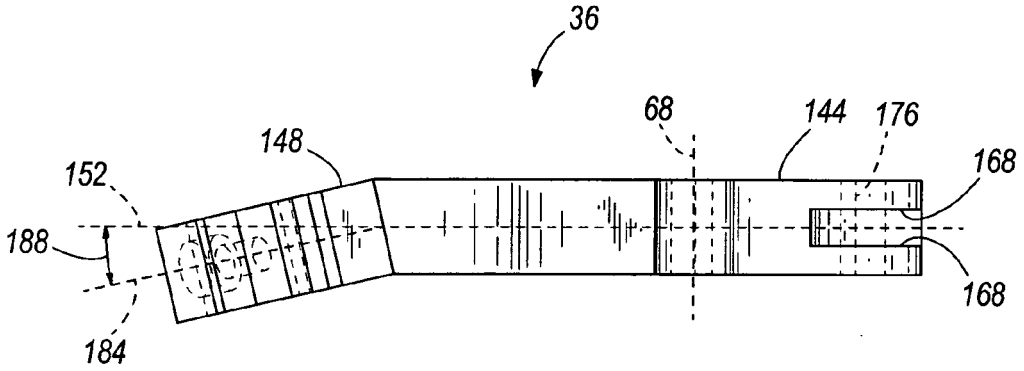
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FIG. 5

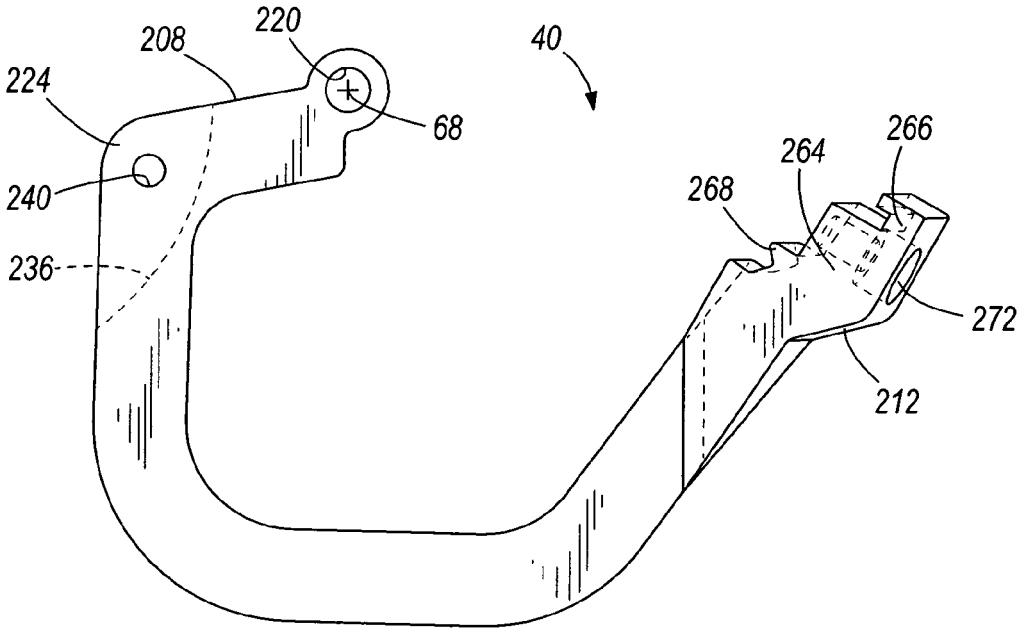
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FIG. 6

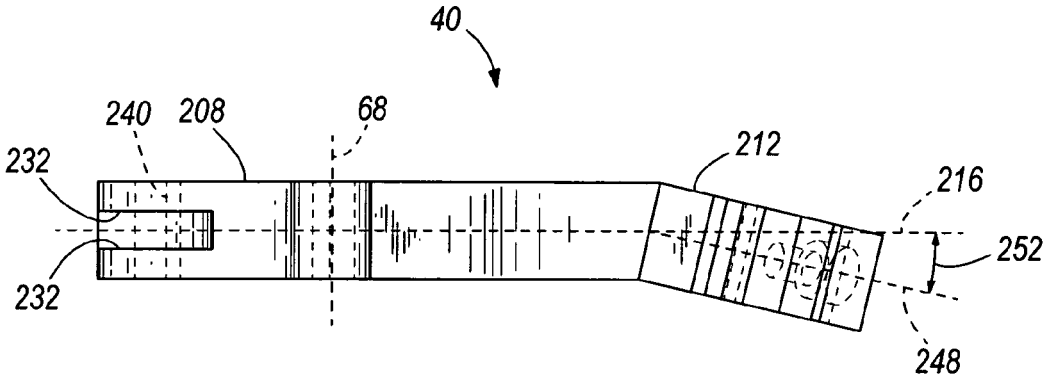
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FIG. 7

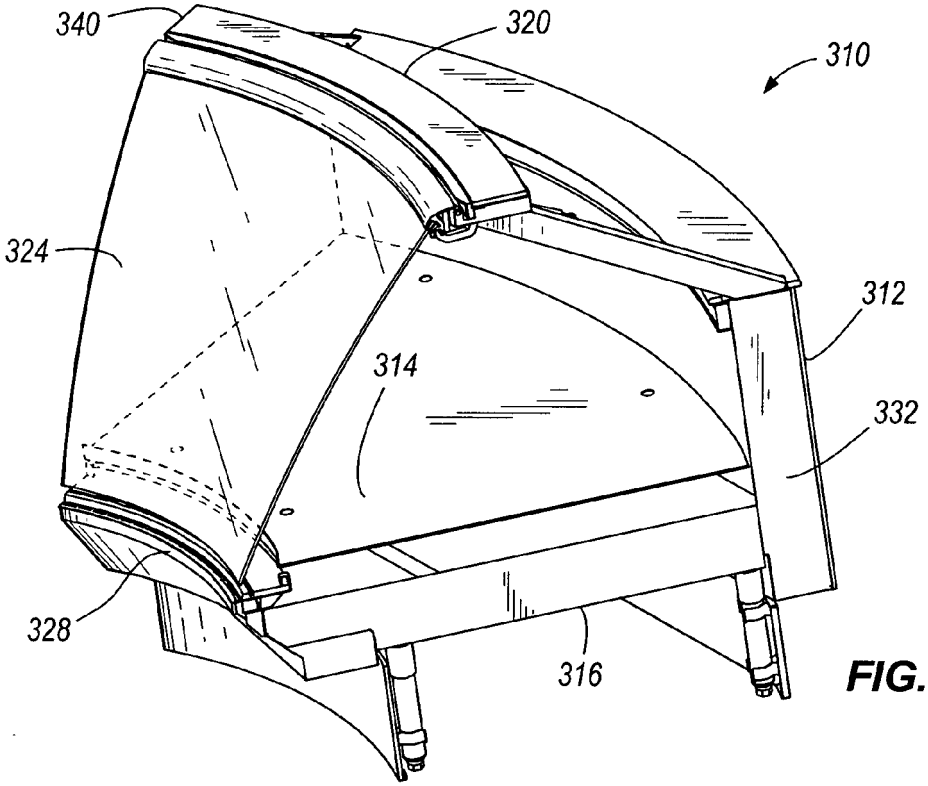
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FIG. 8

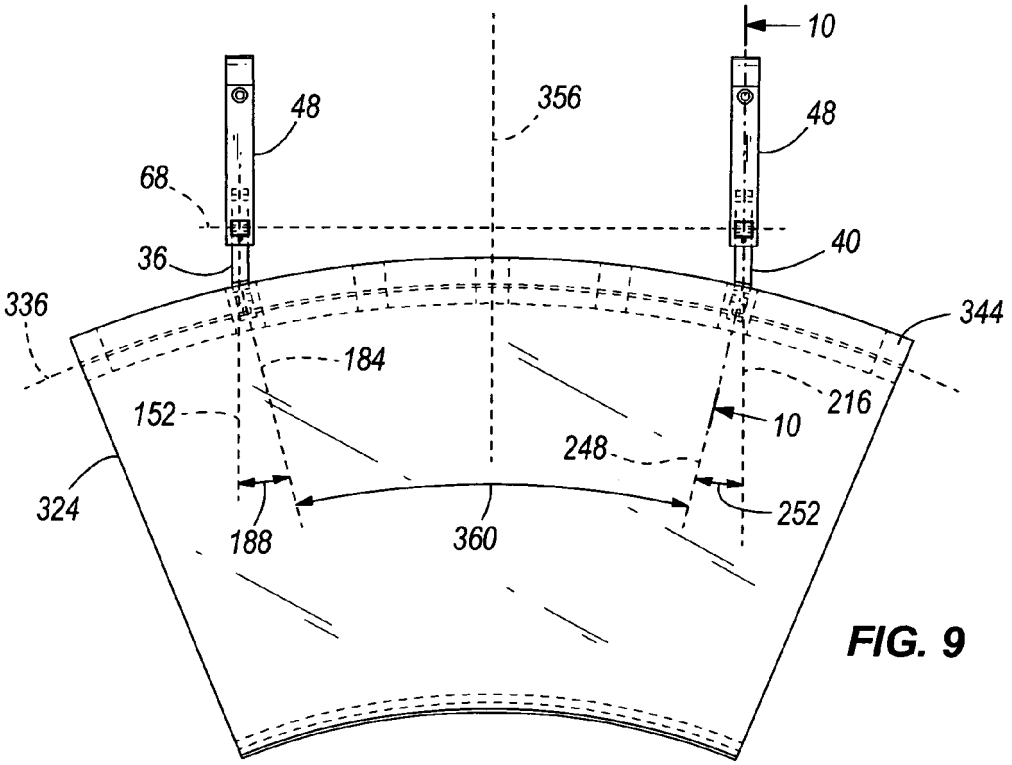
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FIG. 9

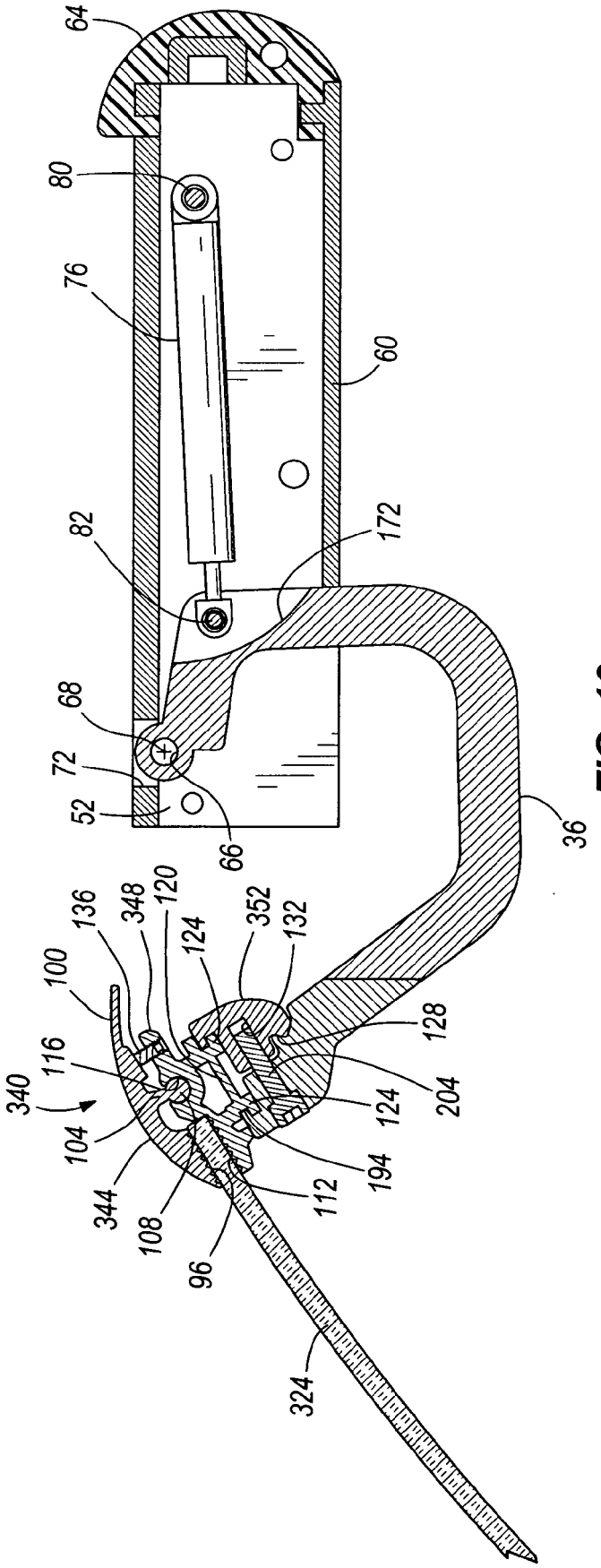
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FIG. 10

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EUROPEAN SEARCH REPORT

Application Number
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	16 May 2008	Reichhardt, Otto

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