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(54) **SUPPORT FOR A PIANO LID**

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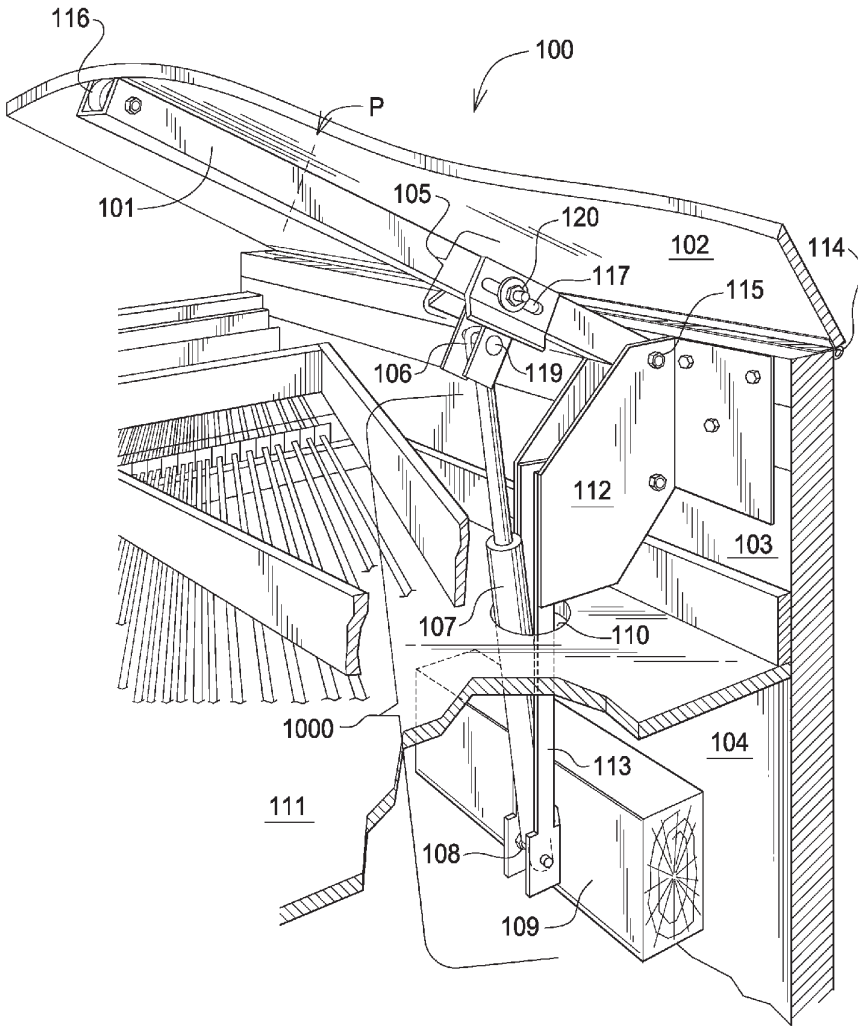
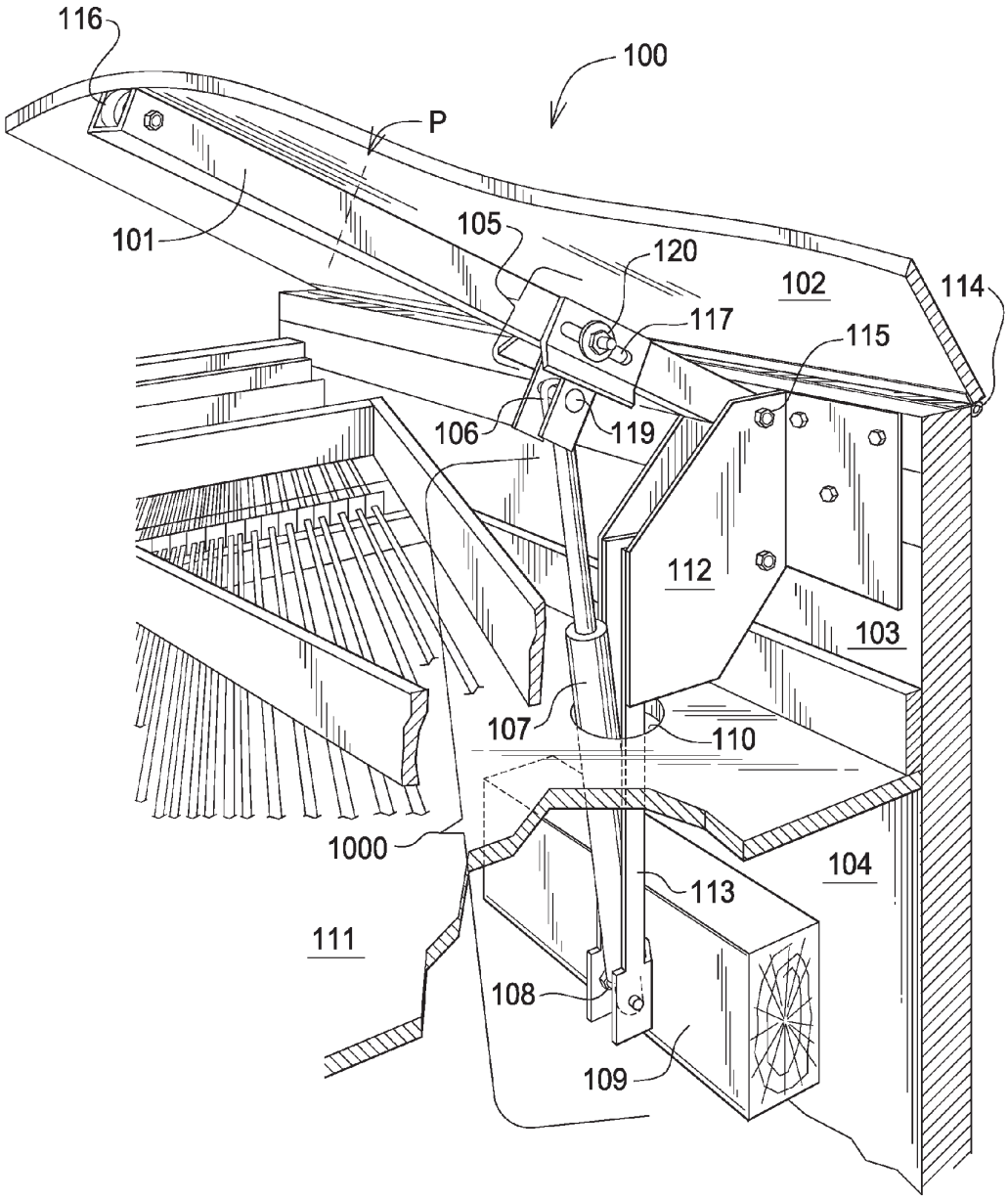
(57) **ABSTRACT**

A mechanism for supporting the weight of a piano lid is disclosed. One or more pneumatic cylinders and arms are used to assist a user in opening and closing the piano lid. In one embodiment, a guiding cup can be removably attached to the frame of the piano below each pneumatic cylinder. When the piano lid is open, the piston arm of the pneumatic cylinder engages the guiding cup. Because the pneumatic cylinder is not attached to the piano frame, the piano lid can be completely removed without the use of tools. Another embodiment provides a mounting bracket that fits over the rear frame of a piano, allowing the mechanism to be retrofit to any existing piano without any damage thereto.

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100
P
101
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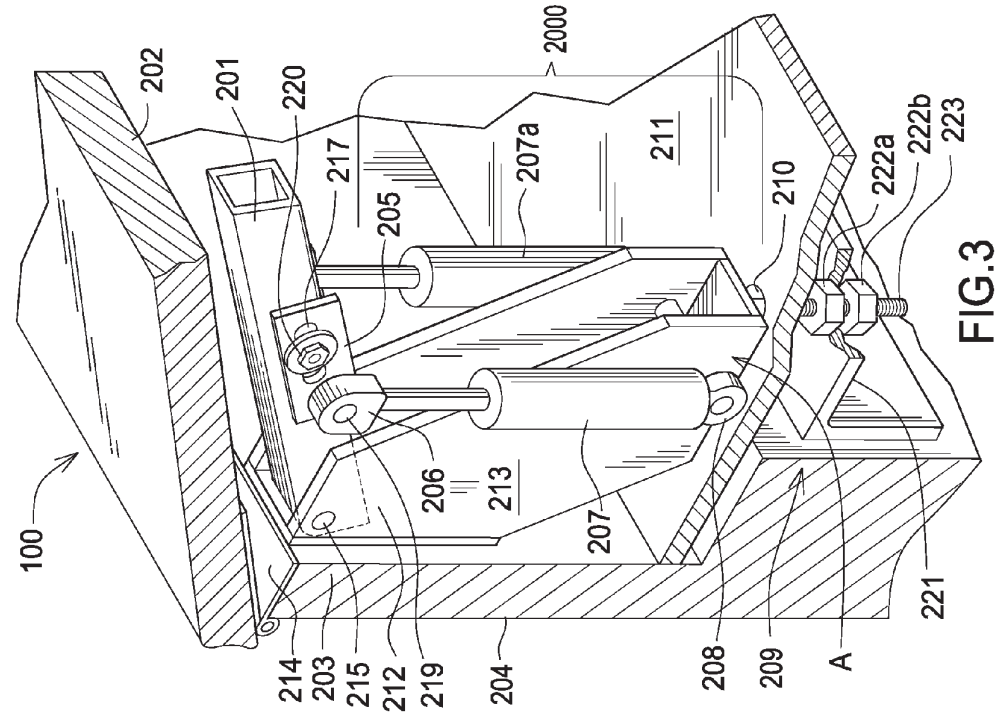
109

FIG.1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202
201
220
217
205
207a
211
210
222a
222b
223
100
206
213
207
214
203
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212
219
204
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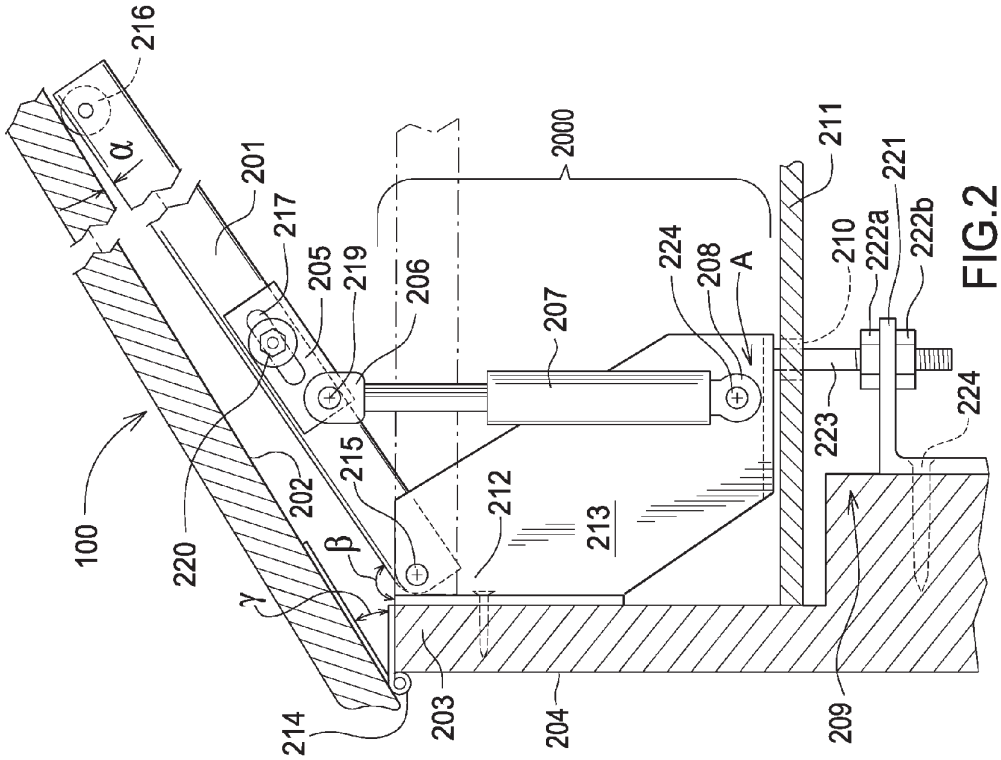
209
A
221

FIG.3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α
201
217
205
219
206
2000
211
207
224
208
A
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222b
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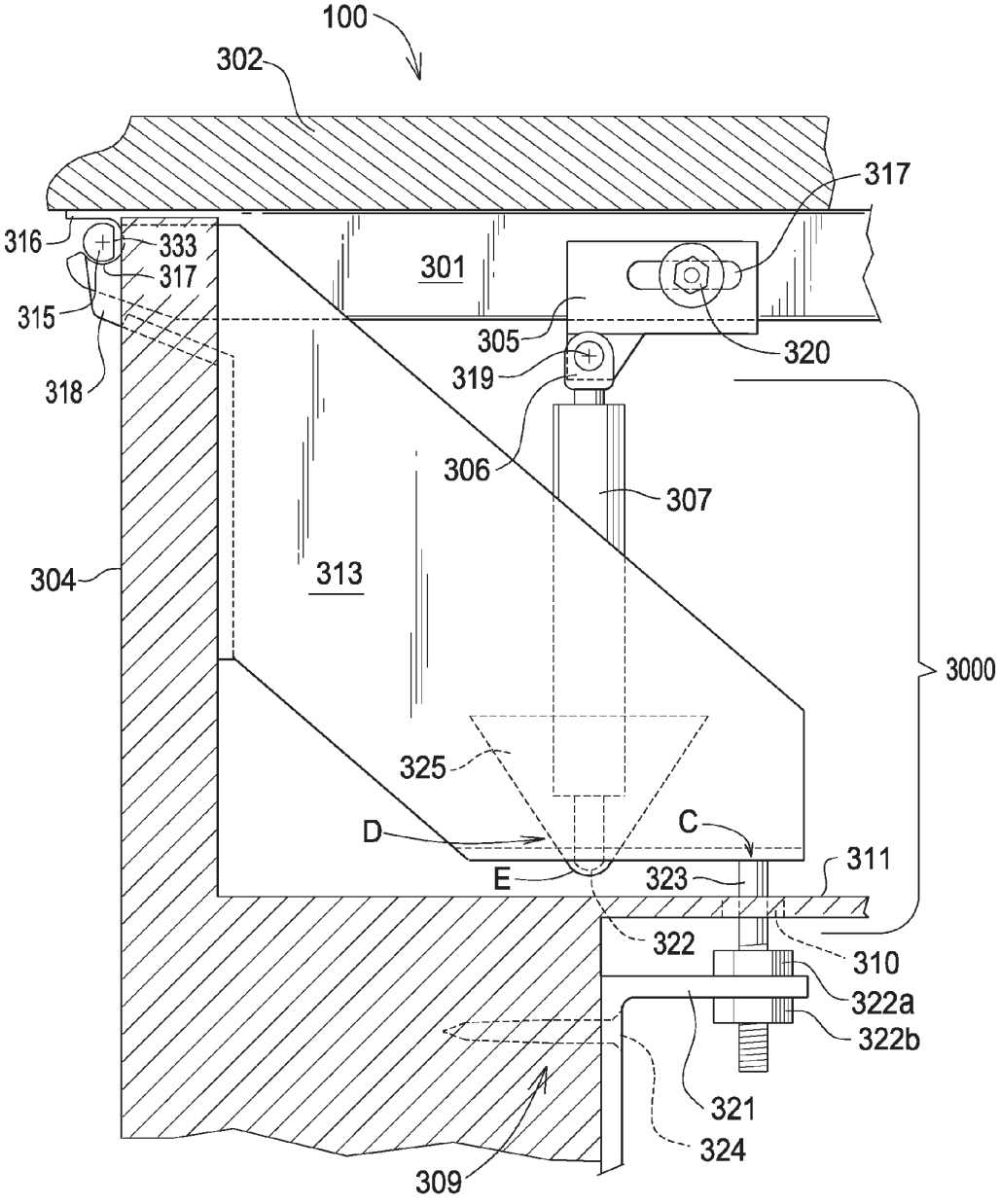
214
203
204
209

FIG.2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302
317
316
333
317
301
315
305
320
319
318
306
307
304
313
3000
325
D
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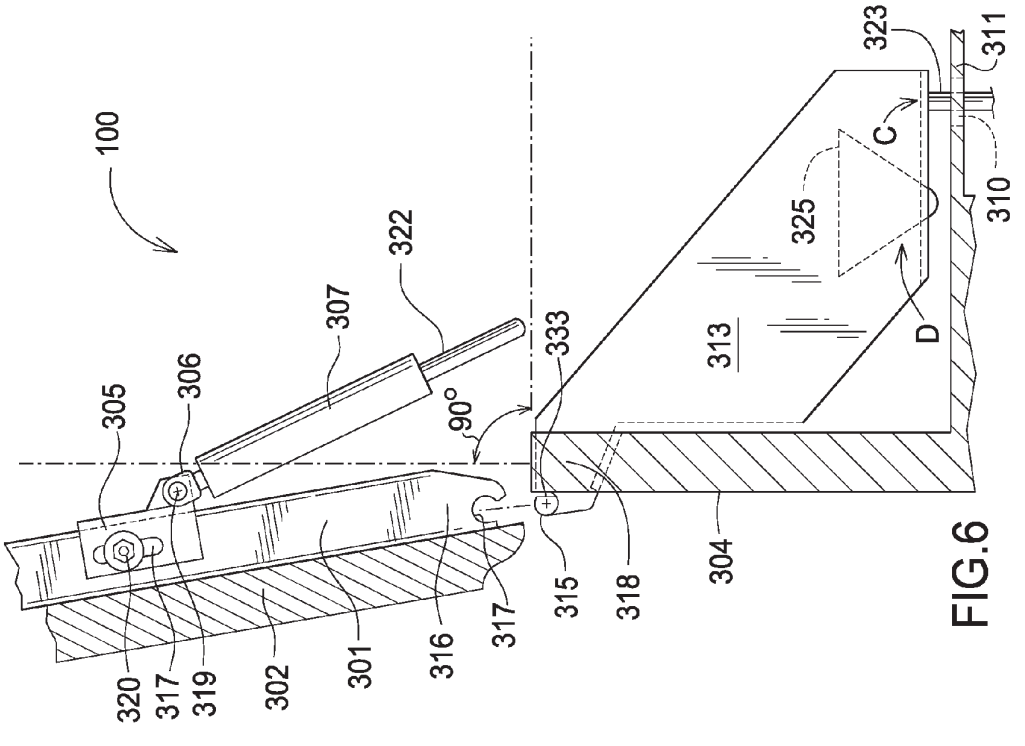
E
323
322
310
322a
322b
321
324
309

FIG.4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322
307
306
305
90°
333
323
311
C
325
310
313
D
320
317
319
302
301
316
317
315
318
304

FIG.6

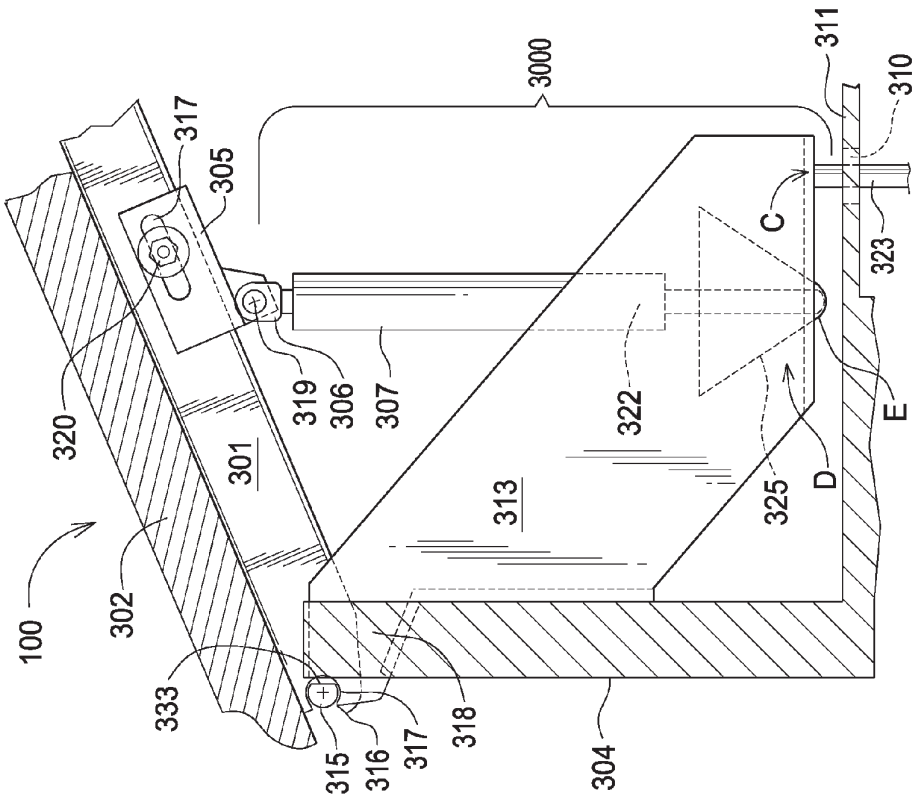
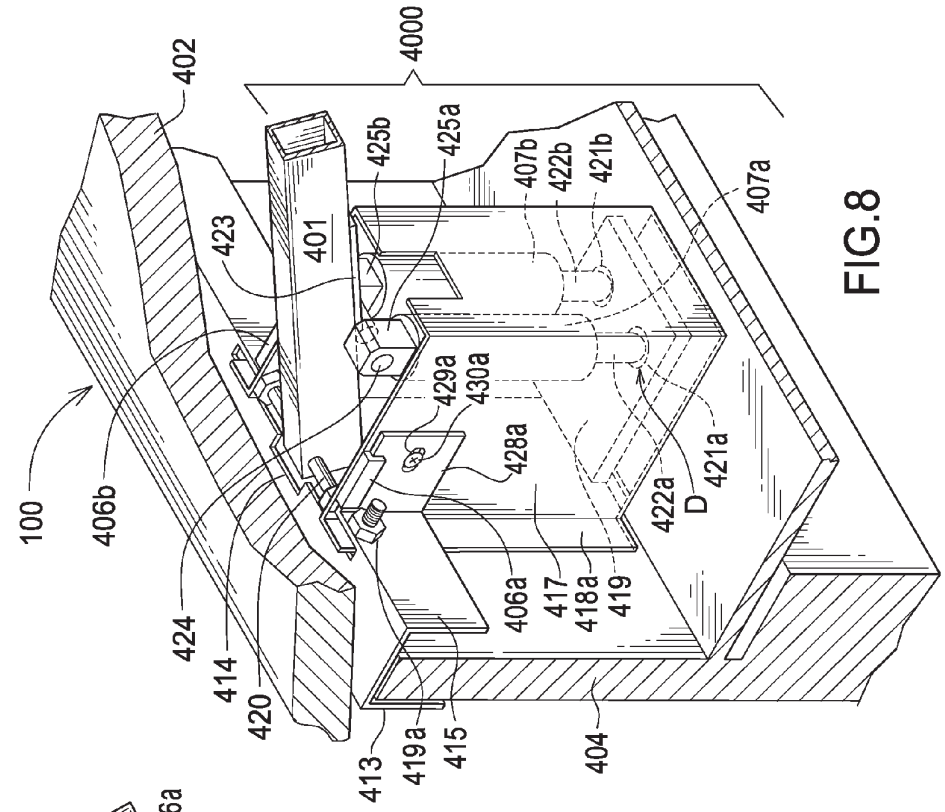

3000
311
310
317
305
C
323
320
319
306
307
322
E
301
313
325
D
100
302
333
315
316
317
318
304

FIG.5


4000
402
425b
425a
407b
422b
421b
407a
423
401
429a
430a
428a
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422a
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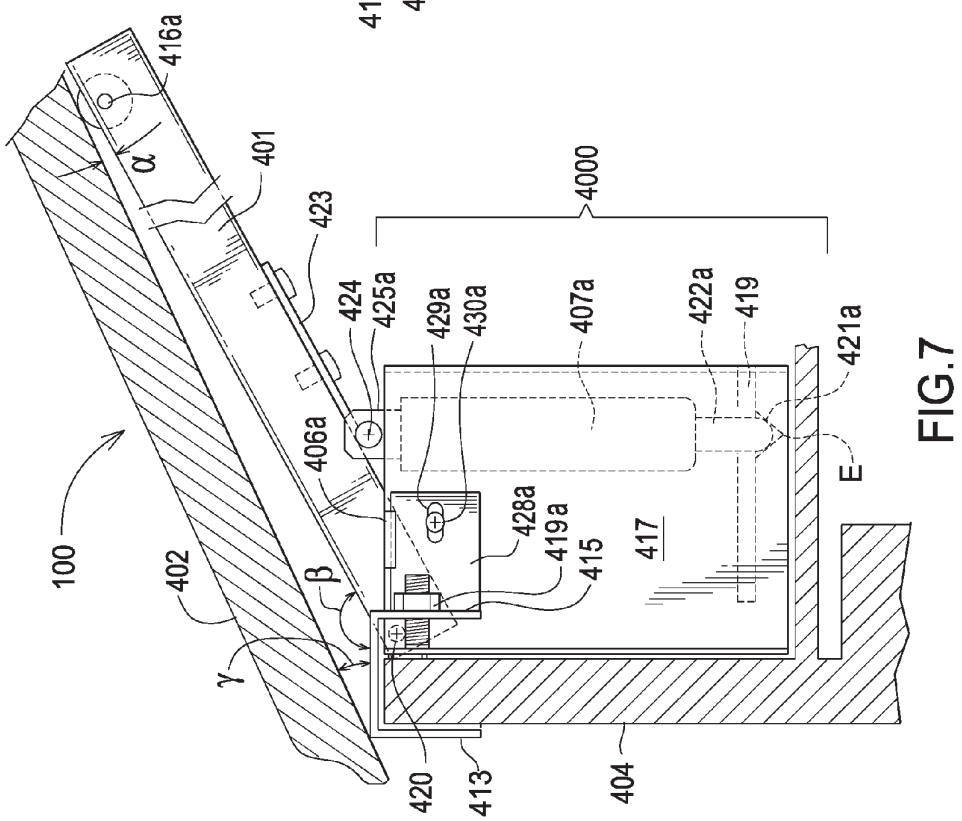
419a
415
404

FIG.8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α
401
423
4000
424
425a
429a
430a
407a
422a
419
421a
406a
E
428a
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415
417
100
402
β
γ
420
413
404

FIG.7

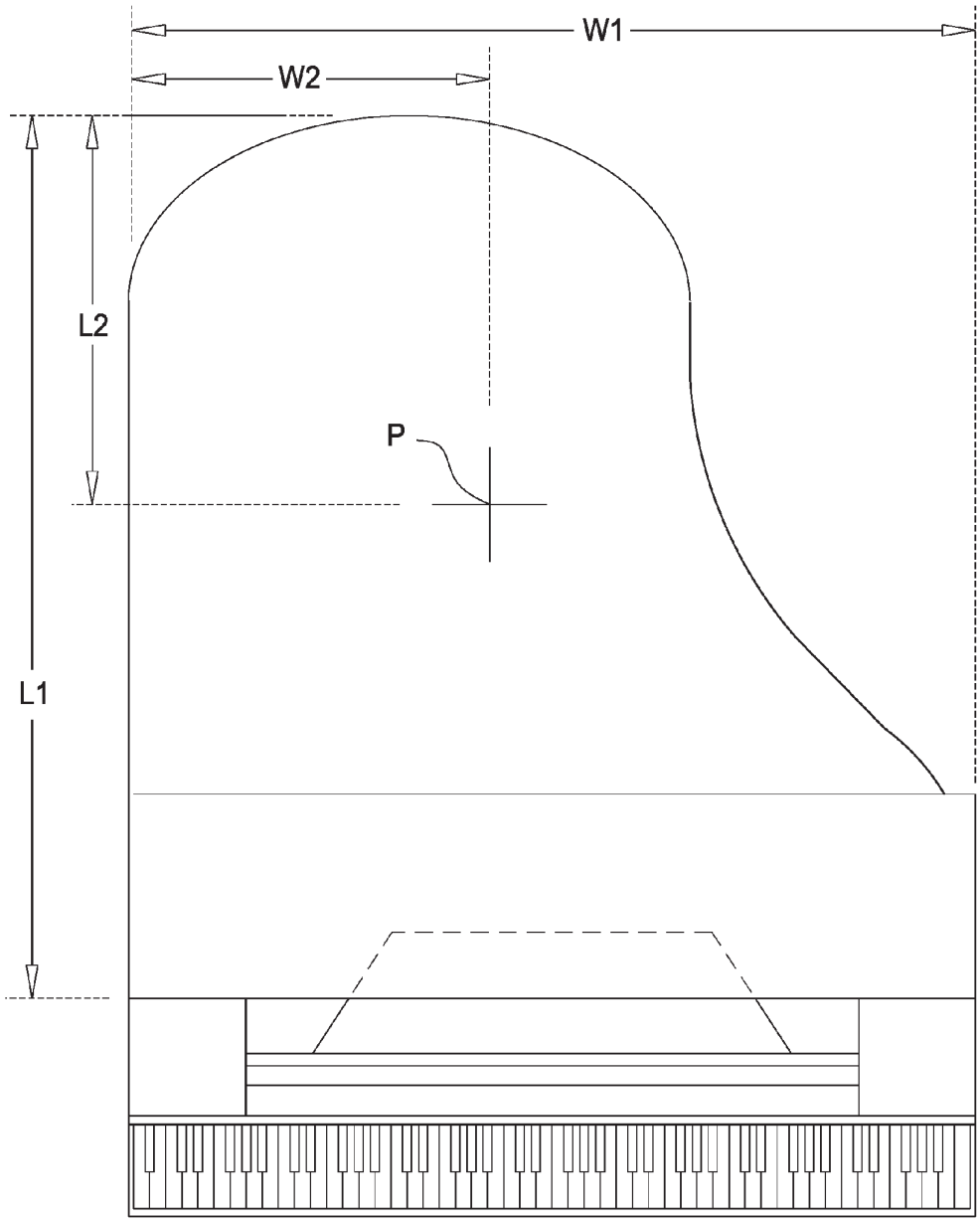

FIG.9

SUPPORT FOR A PIANO LID

CROSS REFERENCE APPLICATIONS

[0001] This application claims the benefits of provisional application No. 61/021,263 filed Jan. 15, 2008 and is a continuation-in-part of international application PCT/US2009/030859 filed Jan. 13, 2009, each of which is hereby incorporated herein by reference for all purposes.

FIELD OF INVENTION

[0002] The present invention relates to a mechanism and method for assisting users in lifting and supporting a piano lid. More specifically, it consists of a mechanism which uses at least one pneumatic cylinder to assist a user in opening and closing a piano lid.

BACKGROUND

[0003] It is often necessary to open the lid of a piano and hold it open. Hinges and braces have been used to open a piano lid and support its weight for some time. Several difficulties exist in opening a piano lid, keeping it open, and eventually closing it. The piano lid is very heavy and can be difficult to raise. Once the lid is raised, it can be difficult to place the end of the brace into the receiving mechanism. Many braces can be easily knocked out of place, causing the lid to drop. When the heavy lid is closed, it can easily overcome the user's strength and fall too quickly, potentially injuring either the user or the piano. Additionally, traditional hinges and braces do not allow a user to bring a piano lid to rest anywhere between an open and closed position.

[0004] The foregoing example of the related art and limitations related therewith are intended to be illustrative and not exclusive. Other limitations of the related art will become apparent to those of skill in the art upon a reading of the specification and a study of the drawings.

SUMMARY

[0005] An aspect of the invention is to assist the user in opening a piano lid.

[0006] Another aspect of the invention is to damp the closing motion of a piano lid.

[0007] A further aspect of the invention is to stop a piano lid at any point between open and closed.

[0008] The following embodiments and aspects thereof are described and illustrated in conjunction with systems, tool and methods which are meant to be exemplary and illustrative, not limiting in scope. In various embodiments, one or more of the above described problems have been reduced or eliminated, while other embodiments are directed to other improvements.

[0009] One embodiment discloses a pneumatic cylinder attached to the frame of a piano. An arm is pivotally attached to the lid of the piano. The pneumatic cylinder and arm are connected. The disclosed embodiment has one arm and one pneumatic cylinder. More arms and cylinders are possible. The pneumatic cylinder and arm can be retrofit to a piano.

[0010] Another embodiment discloses an internal brace attached to the frame of the piano. An arm is removably attached to the lid of the piano. The brace has two pneumatic cylinders removably attached to it. The brace and cylinders are pivotally attached to the arm. More arms and cylinders are possible. The pneumatic cylinder and arm can be retrofit to a piano.

[0011] A further embodiment discloses two arms removably attached to the lid of a piano. Each arm is attached to a pneumatic cylinder. A guiding cup is removably attached to the frame of the piano below each arm and pneumatic cylinder. When the piano lid is closed, the base of the pneumatic cylinder engages the guiding cup. More arms and pneumatic cylinders are possible. Because the pneumatic cylinder is not attached to the piano frame, the piano lid can be completely removed without the use of tools.

[0012] Another embodiment discloses an arm removably attached to a housing. The housing is removably attached to a mounting bracket. The arm is attached to a pair of pneumatic cylinders. Guiding cups are mounted in the housing below each arm and pneumatic cylinder. When the piano lid is closed, the base of the pneumatic cylinder engages the guiding cup. The mounting bracket can be placed over the rear frame of the piano without any modification to the piano.

[0013] In addition to the exemplary aspects and embodiments described above, further aspects and embodiments will become apparent by reference to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] FIG. **1** is a side perspective view of an embodiment of a mechanism for supporting the weight of a piano lid.

[0015] FIG. **2** is a longitudinal sectional view of a second embodiment of a mechanism for supporting the weight of a piano lid.

[0016] FIG. **3** is a perspective view of the embodiment shown in FIG. **2**.

[0017] FIG. **4** is a longitudinal sectional view of a third embodiment of a mechanism for supporting the weight of a piano lid.

[0018] FIG. **5** is a similar view of the embodiment shown in FIG. **4** with the lid partially open.

[0019] FIG. **6** is a similar view of the embodiment shown in FIG. **4** with the lid lifted more than 90° open and separated from the piano.

[0020] FIG. **7** is a longitudinal sectional view of a fourth embodiment of a mechanism for supporting the weight of a piano lid.

[0021] FIG. **8** is a perspective view of the embodiment shown in FIG. **7**.

[0022] FIG. **9** is a top plan view of a grand piano.

[0023] Before explaining the disclosed embodiment of the present invention in detail, it is to be understood that the invention is not limited in its application to the details of the particular arrangement shown, since the invention is capable of other embodiments. Exemplary embodiments are illustrated in referenced figures of the drawings. It is intended that the embodiments and figures disclosed herein are to be considered illustrative rather than limiting. Also, the terminology used herein is for the purpose of description and not of limitation.

DETAILED DESCRIPTION

[0024] Referring first to FIG. **1** a piano **100** includes a lid support **1000** and has an arm **101** attached to the underside of the lid **102**. The lid **102** is attached to the rear frame **104** of the piano **100** by hinge **114**. The lid **102** is shown in the open position. Arm **101** is approximately 40 inches long, approximately 1 inch wide and approximately 1 inch high. Alternatively, arm **101** can end at point P, which represents the center of gravity of the lid **102**. Extending arm **101** beyond point P reduces stress on hinge **114**. In the depicted embodiment, arm **101** is 16 gauge mild steel. While 16 gauge mild steel is depicted, any material of similar strength and rigidity, includ-

ing, but not limited to metals, plastics and ceramics, could be used. Roller **116** rolls on the interior portion of a second end of arm **101**. In the depicted embodiment, roller **116** is approximately 15 mm in diameter and 20 mm in width and is nylon. While a nylon roller is depicted, a roller made of any material of similar strength and rigidity could be used. Roller **116** protrudes from the second end of arm **101** approximately 1-2 mm and contacts lid **102**. No special treatment of the underside of lid **102** is required. Arm **101** is substantially parallel to the underside of lid **102** when lid **102** is in a closed position. As lid **102** is rotated from a closed to an open position, the second end of arm **101** traverses the underside of piano lid **102** and the angle α (depicted in FIG. **2**) between the second end of arm **101** and piano lid **102** increases to a range of approximately 1-3 degrees.

[0025] A first end of arm **101** is attached at pivot point **115** to mounting bracket **112**. Mounting bracket **112** has a leg **113** that extends downward through a hole **110** in the sounding board **111**. In the depicted embodiment, mounting bracket **112** is 1"×1" angle, mild steel. While 1"×1" angle, mild steel is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used. Hole **110** has an approximate diameter of 2 inches. Mounting bracket **112** is attached to the upper interior portion **103** of rear frame **104**. The top of mounting bracket **112** is substantially coplanar with hinge **114**. The joint of hinge **114** is located on the opposing side of rear frame **104** from mounting bracket **112**.

[0026] An adjustable pivotal connector **105** is removably attached to arm **101** at a distance determined by the equation W=(X·F)/L, where W=the weight to lift, X=the distance from the center of pivot point **119** to the center of pivot point **115**, L=the distance from roller **116** to pivot point **115** and F=the force needed in pneumatic cylinder **107** to lift the weight of lid **102**. Bolt **120** is slideable within slot **117** to adjust pivotal connector **105**. The piston arm **106** of a pneumatic cylinder **107** is removably attached to the adjustable pivotal connector **105** at pivot point **119**. The lower portion **108** of the pneumatic cylinder **107** is pivotally attached to the leg **113** of mounting bracket **112**. Leg **113** is connected to the lower interior portion **109** of the rear frame **104** of piano **100**. For the purposes of this application, the rear frame of piano **100** refers to the side on which the hinge for the piano lid is located.

[0027] Once lid support **1000** is installed, piano lid **102** can be opened and closed with ease. Additionally, piano lid **102** can now be stopped at any point between open and closed. A user can open, close or stop the lid with as little as one half Newton of force, the equivalent of the force exerted by a single finger.

In the disclosed embodiment pneumatic cylinder **107** can be a range of sizes exerting between approximately 50 Newtons of force to approximately 1,300 Newtons of force. In the depicted embodiment, pneumatic cylinder **107** has an extended length of 7½ inches, a diameter of 1 inch, a ⅜ inch cylinder rod, a 2 inch stroke and exerts 1,000 Newtons of force. As shown in FIGS. **2** and **3**, a second embodiment, lid support **2000**, a mechanism for supporting weight of piano lid is shown. Lid **202** is attached to the rear frame **204** of piano **100** by hinge **214**. For the purposes of this application, the rear frame of piano **100** refers to the side on which the hinge for the piano lid is located. Lid **202** is shown in the open position. An arm **201** rolls on the underside of the lid **202**. No special treatment of the underside of lid **202** is required. A first end of arm **201** is attached to the rear upper portion **212** of a bracket **213** at pivot point **215**. Bracket **213** is attached to the upper interior portion **203** of the rear frame **204** of piano **100** and the sounding board **211**. The top of bracket **213** is substantially coplanar with hinge **214**. The joint of the hinge **214** is located on the opposing side of rear frame **204** from bracket **213**. In the depicted embodiment, bracket **213** is made from 1"×1" square tube, 16 gauge mild steel. While 1"×1" square tube, 16 gauge mild steel is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used.

[0028] Arm **201** is approximately 40 inches long, approximately 1 inch wide and approximately 1 inch high. Alternatively, arm **201** can end at the center of gravity of lid **202**. Extending arm **201** beyond the center of gravity of lid **202** reduces stress on hinge **214**. In the depicted embodiment, arm **201** is made from 16 gauge mild steel. While 16 gauge mild steel is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used. Roller **216** is attached to the interior portion of a second end of arm **201**. In the depicted embodiment, roller **216** is approximately 15 mm in diameter, 20 mm in width and is nylon. While a nylon roller is depicted, a roller made of any material of similar strength and rigidity could be used. Roller **216** protrudes from the second end of arm **201** approximately 1-2 mm and contacts lid **202**. Arm **201** is substantially parallel to the underside of lid **202** when lid **202** is in a closed position. As lid **202** is rotated from a closed to an open position, the angle represented by α increases from approximately 0 degrees to approximately 1-3 degrees, the angle represented by β increases to approximately 132-150 degrees and the angle represented by γ increases to approximately 32-45 degrees.

[0029] Adjustable pivotal connector **205** is removably attached to opposing sides of the arm **201** at a distance determined by the equation W=(X·F)/L, where W=the weight to lift, X=the distance from the center of pivot point **219** to the center of pivot point **215**, L=the distance from roller **216** to pivot point **215** and F=the force needed in pneumatic cylinders **207**, **207***a* to lift the weight of lid **202**. Bolt **220** is slideable within slot **217** to adjust pivotal connector **205**. The piston arms **206** of pneumatic cylinders **207**, **207***a* are removably attached to adjustable pivotal connector **205** at pivot point **219**. The lower portion **208** of pneumatic cylinders **207**, **207***a* are removably attached to opposing sides of area A of the bracket **213** at pivot point **224**.

[0030] Optionally, a leg **223** can be attached to the lower portion of bracket **213** to provide structural support. Leg **223** extends through a hole **210** in the sounding board **211** and is removably attached to bracket **221** with nuts **222***a*, **222***b*. In the depicted embodiment, hole **210** has an approximate diameter of ½ inch. Bracket **221** is attached to the lower portion **209** of the rear frame **204** of piano **100** with bolt **224**.

[0031] Once lid support **2000** is installed, piano lid **202** can be opened and closed with ease. Additionally, piano lid **202** can now be stopped at any point between open and closed. A user can open, close or stop the lid with as little as one half Newton of force, the equivalent of the force exerted by a single finger.

[0032] In the disclosed embodiment pneumatic cylinder **207** can be a range of sizes exerting between approximately 50 Newtons of force to approximately 1,300 Newtons of force. In the depicted embodiment, pneumatic cylinder **207** has an extended length of 7½ inches, a diameter of 1 inch, a ⅜ inch cylinder rod, a 2 inch stroke and exerts 1,000 Newtons of force.

[0033] As shown in FIGS. **4**, **5** and **6**, a third embodiment, lid support **3000**, a mechanism for supporting the weight of piano lid **302**, has an arm **301** attached to the underside of the lid **302** of piano **100**. A first end **316** of arm **301** has a recessed opening **317**. Arm **301** is approximately 40 inches long,

approximately 1 inch wide and approximately 1 inch high. Alternatively, arm **301** can end at the center of gravity of the lid **302**. In the depicted embodiment, arm **301** is 16 gauge mild steel. While 16 gauge mild steel is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used.

[0034] Adjustable pivotal connector **305** is removably attached to opposing sides of arm **301** at a distance determined by the equation W=(X·F)/L, where W=the weight to lift, X=the distance from the center of pivot point **319** to the center of pin **315**, L=the distance from the second end of arm **301** to pin **315** and F=the force needed in pneumatic cylinder **307** to lift the weight of lid **302**. Bolt **320** is slideable within slot **317** to adjust pivotal connector **305**.

[0035] The piston arm **306** of a pneumatic cylinder **307** is attached to adjustable pivotal connector **305** at pivot point **319**. The upper portion **318** of a bracket **313** is attached to the upper portion of the rear frame **304** of piano **100**. A guiding cup **321** is attached to area D of bracket **313**. Area D is approximately one third of the distance total depth of bracket **313** from the frontal portion of bracket **313**. Guiding cup **325** is conical in shape. The base E of guiding cup **325** is just large enough to accept the piston arm **322** of pneumatic cylinder **307**. When lid **302** is closed, gravity will pull piston arm **322** into guiding cup **321**. The conical shape of guiding cup **325** will cause the piston arm **322** of pneumatic cylinder **307** to rest in the base E of guiding cup **325**.

[0036] In the depicted embodiment, bracket **313** is made from 1"×1" square tube, 16 gauge mild steel. While 1"×1" square tube, 16 gauge mild steel is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used. In the depicted embodiment, pneumatic cylinder **307** can be a range of sizes exerting between approximately 50 Newtons of force and approximately 1,300 Newtons of force. In the depicted embodiment, the cylinder has an extended length of 7½ inches, a diameter of 1 inch, a ⅜ inch cylinder rod, a 2 inch stroke and exerts 1,000 Newtons of force.

[0037] The interaction of the upper portion **318** of bracket **313** and recessed opening **317** of arm **301** acts as a hinge to attach lid **302** to the rear frame **304** of piano **100**. A pin **315** is inserted in recessed opening **317** and acts as a joint for the created hinge. The interior portion **333** of pin **315** is missing a portion of its circumference. In the depicted embodiment, pin **315** is approximately 2½ long. The missing portion of the circumference of the interior portion **333** of pin **315** and the size of recessed opening **317** are proportionate. Recessed opening **317** of arm **301** extends greater than 180 degrees around the circumference of pin **315**. Thus, lid **302** must be lifted beyond 90 degrees (see dotted line of 90 degrees marked "90°" in FIG. **6**) in order to remove the lid **302** from piano **100**. Once lid **302** is lifted beyond approximately 90 degrees, the missing portion of the circumference of the interior portion **333** of pin **315** allows lid **302** to be completely removed from piano **100**. Extending arm **301** beyond the center of gravity of lid **302** reduces stress on the upper portion **318** of bracket **313** and recessed opening **317** of arm **301**, which act as the hinge to attach lid **302** to piano **100**.

[0038] Optionally, a leg **323** can be attached to the lower portion of bracket **313** to provide structural support. Leg **323** extends through a hole **310** in the sounding board **311** and is removably attached to bracket **321** with nuts **322***a*, **322***b*. Hole **310** has an approximate diameter of ½ inch. Bracket **321** is attached to the lower portion **309** of the rear frame **304** of the piano **100** with bolt **324**. For the purposes of this application, the rear frame of piano **100** refers to the side on which the hinge for the piano lid is located.

[0039] The disclosed third embodiment **3000** has an arm assembly on the opposite side of the piano that is a mirror image of that disclosed in FIGS. **4**, **5** and **6**.

[0040] Once lid support **3000** is installed, piano lid **302** can be opened and closed with ease. Additionally, piano lid **302** can now be stopped at any point between open and closed. A user can open, close or stop the lid with as little as one half Newton of force, the equivalent of the force exerted by a single finger.

[0041] FIG. **4** shows the lid **302** in the closed position.

[0042] FIG. **5** shows the lid **302** raised from the closed position. FIG. **6** shows the lid **302** completely removed from the piano.

[0043] As shown in FIGS. **7** and **8**, a fourth embodiment, lid support **4000**, a mechanism for supporting the weight of piano lid **402**, has a mounting bracket **413** placed over the rear frame **404** of the piano **100**. For the purposes of this application, the rear frame of piano **100** refers to the side on which the hinge for the piano lid is located. In the depicted embodiment, bracket **413** is 16 gauge mild steel sheet metal. While 16 gauge mild steel sheet metal is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used. The internal surface of mounting bracket **413** is coated with felt so as not to scratch the surface of the piano. While felt is the preferred material, any material that would prevent scratching could be used. Mounting bracket **413** has a recessed portion **414** in the approximate center of its front face **415**. Mounting bracket **413** has holes (not shown) on either side of recessed portion **414**. Connector **428***a* extends generally perpendicular to front face **415** of mounting bracket **413**. Connector **428***a* includes slots **429***a*. A mirror image connector extends from the other side of mounting bracket **413** and is not shown. The top of mounting bracket **413** is substantially coplanar with the hinge connecting lid **402** to the rear frame **404** of piano **100**. The joint of the hinge connecting lid **402** to the rear frame **404** of piano **100** is located on the opposing side of rear frame **1404** from front face **415** of mounting bracket **413**. In the disclosed embodiment, mounting bracket **413** is approximately 10 inches long, approximately 1.25 inches high and approximately 1.5-2 inches wide. In the disclosed embodiment, recessed portion **414** of mounting bracket **413** is approximately 2.5 inches long.

[0044] A housing **417** is attached to mounting bracket **413**. In the depicted embodiment, housing **417** is 16 gauge mild steel sheet metal. While 16 gauge mild steel sheet metal is depicted, any material of similar strength and rigidity, including, but not limited to metals, plastics and ceramics, could be used. Housing **417** has a width approximately equal to that of the recessed portion of mounting bracket **413**. In the disclosed embodiment, housing **417** has a length of approximately 4 inches, a height of approximately 5.5 inches, and a width of approximately 2.5 inches. Housing **417** has extension **418***a*. In the disclosed embodiment, extension **418***a* has a width of 0.75 inches. Extension **418***a* extends behind front face **415** of mounting bracket **413** and is attached thereto via screw **419***a*. In the disclosed embodiment screw **419***a* is a socket head bolt 5⁄16"-18×¾". The rear face of extension **418***a* is coated with felt. While felt is the preferred material, any material that would prevent scratching could be used. Housing **417** has a mirror image extension on its other side, which is not shown. Screw **430***a* further attaches housing **417** to mounting bracket **413**. Screw **430***a* is slideable within slot **429***a*. In use, the interaction of screw **430***a* and slot **429***a* functions to prevent connector **428***a* and housing **417** from moving when bolt **419***a* is tightened. Bracket **406***a* also functions to prevent connector **428***a* and housing **417** from moving when bolt

419*a* is tightened. Screw **430***a*, slot **429***a* and bracket **406***a* can all be used together. Alternatively, a user may choose to use either screw **430***a* and slot **429***a* or bracket **406***a*. It should be understood that any method that can prevent connector **428***a* and housing **417** from moving when bolt **419***a* is tightened may also be used. The base **419** of housing **417** has guiding cups **421***a*, **421***b* in area D. Area D is approximately one third of the distance from the frontal portion of housing **417**. Guiding cups **421***a*, **421***b* are conical in shape.

[0045] An arm **401** is attached to housing **417** via a pin **420**. Pin **420** transverses a first end of arm **401** and mounts in housing **417**. In the disclosed embodiment pin **420** has a diameter of approximately ⅜". A second end of arm **401** rolls on the underside of lid **402** via roller **416**. No special treatment of the underside of lid **402** is required. Roller **416** is attached to the interior portion of the second end of arm **402**. Arm **401** is substantially parallel to the underside of lid **402** when lid **402** is in a closed position. As lid **402** is rotated from a closed to an open position, the second end of arm **401** traverses the underside of piano lid **402** and the angle represented by a increases from approximately 0 degrees to approximately 1-3 degrees, the angle represented by β increases to approximately 132-150 degrees and the angle represented by y increases to approximately 32-45 degrees.

[0046] Arm **401** is approximately 40 inches long, approximately 1 inch wide and approximately 1 inch high. In the depicted embodiment, arm **401** is 16 gauge mild steel. Alternatively, arm **401** can end at the center of gravity of the lid **402**. Extending arm **401** beyond the center of gravity of lid **402** reduces stress on the existing hinges. In the depicted embodiment, roller **416** is approximately 15 mm in diameter, 20 mm in width and is nylon. While a nylon roller is depicted, a roller made of any material of similar strength and rigidity could be used. Roller **416** protrudes from the second end of arm **401** approximately 1-2 mm and contacts lid **402**.

[0047] Bracket **423** is removably attached to the underside of arm **401**. A pin **424** is attached to bracket **423**. Pneumatic cylinders **407***a*, **407***b* are attached via eyelets **425***a*, **425***b* to either side of pin **424**. In the disclosed embodiment pin **424** and eyelets **425***a*, **425***b* each have a diameter of approximately ⅜". The location of bracket **423** on arm **401** is determined by the equation W=(X·F)/L, where W=the weight to lift, X=the distance from the center of pin **424** to the center of pin **420**, L=the distance from roller **416** to pin **420** and F=the force needed in pneumatic cylinder **407***a*, **407***b* to lift the weight of lid **402**.

[0048] The base E of guiding cups **421***a*, **421***b* is just large enough to accept the piston arms **422***a*, **422***b* of pneumatic cylinders **407***a*, **407***b*. When lid **402** is closed, gravity will pull piston arms **422***a*, **422***b* into guiding cups **421***a*, **421***b*. The conical shape of guiding cups **421***a*, **421***b* will cause the piston arms **422***a*, **422***b* of pneumatic cylinder **407***a*, **407***b* to rest in the base E of guiding cups **421***a*, **421***b*.

[0049] Pneumatic cylinder **407** can be a range of sizes exerting between approximately 50 Newtons of force and approximately 1,300 Newtons of force. In a preferred embodiment, the cylinder has an extended length of 7½ inches, a diameter of 1 inch, a ⅜ inch cylinder rod, a 2 inch stroke and exerts 1,000 Newtons of force.

[0050] In use, mounting bracket **413** is placed over the rear frame **404** of a piano **100** at a chosen point between the existing hinges. Screws **419***a*, **419***b* are used to tighten lid support **4000** onto the piano **100**. Piano lid **402** can now be opened and closed with ease. Additionally, piano lid **402** can now be stopped at any point between open and closed. A user can open, close or stop the lid with as little as one half Newton of force, the equivalent of the force exerted by a single finger.

[0051] FIG. **9** shows a top plan view of a grand piano. Grand piano lid **502** has a width, measured between W**1** and W**2**, of approximately 150 cm. Grand piano lid **502** has a length, measured between L**1** and L**2**, of between approximately 140 cm and 275 cm, depending on the type of grand piano. Grand piano lid **502** weighs between 21 and 65 pounds, depending on the type of grand piano. The center of gravity P for grand piano lid **502** is located between 55 and 60% of the total length of piano lid **502** when measured from L**2** and between 40 and 45% of the total width of piano lid **502** when measured from W**1**. Variation in the center of gravity is caused by variations in the size and shape of piano lid **502**. The lid support of the present invention can be adjusted along the length of the piano **100** during installation to locate the exact center of gravity. The disclosed embodiments of the present invention can be used with a grand piano as disclosed in FIG. **9**. A single lid support of the present invention can support a lid of up to approximately 45 pounds having a length of up to approximately 214 cm. Two lid supports of the present invention are utilized to support a lid of greater than approximately 45 pounds having a length of greater than 214 cm.

[0052] While a number of exemplary aspects and embodiments have been discussed above, those of skill in the art will recognize certain modifications, permutations, additions and sub-combinations therefore. It is therefore intended that the following appended claims hereinafter introduced are interpreted to include all such modifications, permutations, additions and sub-combinations are within their true spirit and scope. Each apparatus embodiment described herein has numerous equivalents.

I claim:

1. A support for a piano lid comprising:
an arm having a first end and a second end;
said second end in contact with an underside of a piano lid;
said first end pivotally attached to a mounting bracket;
said arm substantially parallel to said underside of a piano lid when said lid is in a closed position;
as said lid is rotated from a closed to an open position the second end of said arm traverses the underside of the piano lid and the angle between said second end of said arm and said lid increases to about 2 degrees;
said mounting bracket attached to the rear frame of a piano; and
a pneumatic cylinder pivotally attached to said arm.

2. The apparatus of claim **1**, wherein said mounting bracket further comprises a leg extending below the bracket, said bracket attached to said rear frame below the sounding board.

3. The apparatus as claimed in claim **1** having multiple pneumatic cylinders.

4. The apparatus as claimed in claim **1** wherein the top of the mounting bracket is substantially coplanar with the hinge connecting the piano lid to the rear frame.

5. The apparatus as claimed in claim **1** wherein the joint of the hinge connecting the piano lid to the rear frame is located on the opposing side of the rear frame from the mounting bracket.

6. The apparatus as claimed in claim **1** wherein the angle between the second end of the arm and the lid increases to about 3 degrees as said lid is rotated from a closed to an open position.

7. The apparatus as claimed in claim **1** wherein the angle between the second end of the arm and the lid increases to about 2 degrees as said lid is rotated from a closed to an open position.

8. A support for a piano lid comprising:
arm means for supporting a piano lid;
said arm means having a first end and a second end;
said arm means substantially parallel to said piano lid when said lid is in a closed position;
as said lid is rotated from a closed to an open position the second end of said arm means traverses the underside of the piano lid and the angle between said second end of said arm means and said lid increases to about 2 degrees;
means for connecting said first end of said arm means to said piano;
a portion of said means for connecting substantially coplanar with the hinge connecting said piano lid to the rear frame of a piano;
the joint of said hinge located on the opposing side of said rear frame from said means for connecting;
means for assisting a user in opening a piano lid and dampening the closing motion of said piano lid;
said means for assisting a user in opening a piano lid and dampening the closing motion of said piano lid comprising a pneumatic cylinder; and
means for connecting said arm to said means for assisting a user in opening a piano lid and dampening the closing motion of said piano lid.

9. The apparatus of claim **6**, wherein said means for connecting comprises a mounting bracket.

10. The apparatus as claimed in claim **8**, wherein said means for assisting a user in opening a piano lid and damping the closing motion of said piano lid comprises multiple pneumatic cylinders.

11. The apparatus as claimed in claim **8** wherein the angle between the second end of the arm and the lid increases to about 2 degrees as said lid is rotated from a closed to an open position.

12. The apparatus as claimed in one of claim **8** wherein the angle between the second end of the arm and the lid increases to about 2 degrees as said lid is rotated from a closed to an open position.

13. A support for a piano lid comprising:
an arm attached to the underside of a piano lid;
said arm having a first end and a second end;
said first end having a recessed opening;
a pneumatic cylinder pivotally attached to said arm;
a mounting bracket attached to the rear frame of a piano;
the interaction of said recessed opening and the upper portion of said mounting bracket creating a hinge;
a pin sized to fit into said recessed opening of said arm;
said pin having a portion of the circumference of its interior surface removed;
said pin forming the joint of said hinge;
said recessed opening extending more than 180 degrees around said pin;
wherein rotating said piano lid greater than approximately 90 degrees will allow removal of said lid from said piano.

14. The apparatus of claim **13**, wherein said mounting bracket includes a guiding cup.

15. The apparatus as claimed in claim **13**, wherein said mounting bracket further comprises a leg extending below the bracket, said bracket attached to said rear frame below the sounding board.

16. An apparatus for us with a piano, the piano having an upper interior portion of a frame of the piano, the apparatus comprising:
a mounting bracket;
said mounting bracket having a first portion extending parallel to the upper interior portion of a piano frame;
said mounting bracket having a second portion extending downward from said parallel portion on the outside of the piano frame;
said mounting bracket having a third portion extending downward from said parallel portion on the inside of the piano frame;
wherein said mounting bracket fits over said upper interior portion of the piano frame;
an arm having a first end and a second end;
said second end in contact with an underside of the lid of said piano;
said first end pivotally attached to said mounting bracket;
said arm substantially parallel to said underside of a piano lid when said lid is in a closed position;
as said lid is rotated from a closed to an open position the second end of said arm traverses the underside of the piano lid; and
a pneumatic cylinder pivotally attached to said arm.

17. A method for supporting a piano lid comprising the steps of:
lowering a mounting bracket over the upper interior portion of a piano frame;
said mounting bracket having a first portion extending parallel to the upper interior portion of a piano frame;
said mounting bracket having a second portion extending downward from said parallel portion;
said mounting bracket having a third portion extending downward from said parallel portion;
whereby said first portion is on top of the upper interior portion of the piano frame;
whereby the second portion is on the outside of the upper interior portion of the piano frame;
the method further comprising pivotally attaching a first end of an arm to the first portion of said mounting bracket;
the method further comprising pivotally attaching a pneumatic cylinder to said arm; and
the method further comprising placing the second end of said arm in contact with the piano lid.

18. The method of claim **17** further comprising opening the lid to at least 30 degrees.

19. The method of claim **18** wherein the lid stays open to at least 30 degrees when a user removes his or her hand.

20. The method of claim **17** wherein a user exerts as little as one half Newton of force to open the lid.

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