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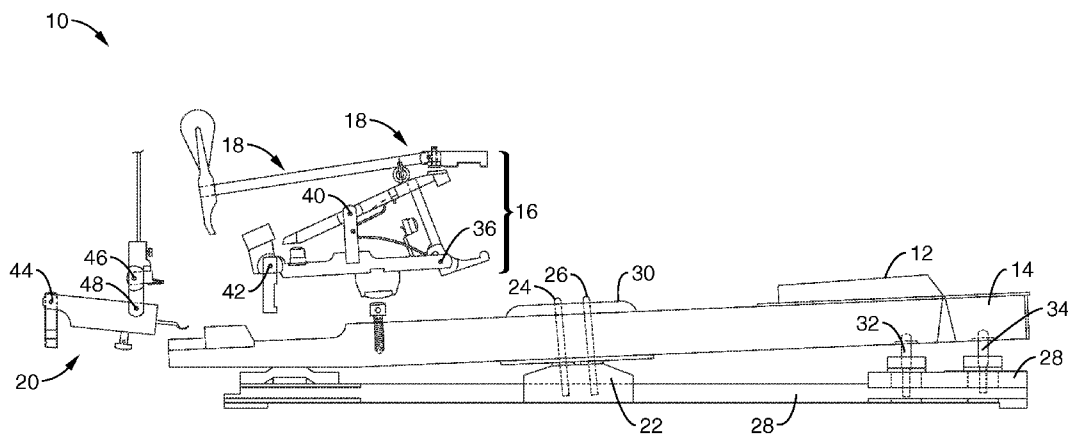
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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31 July 2008

(54) Title: REDUCED FRICTION PIANO ACTION PINS



(57) Abstract: An improved key pin and action pin that is resistant to corrosion, is very durable and has surfaces with a very low coefficient of friction. The pins are preferably made of aluminum or aluminum alloy with a hardened anodized oxide surface. The anodized pins may be polished to provide a surface with a very low coefficient of friction that is also very durable. As a consequence of the low friction and corrosion resistance, piano actions using the pins have less resistance providing an action with a lighter "feel" and consistency. Longevity of the components of the action and the pins is also greatly improved especially for pianos located in humid climates where traditional pins experience corrosion.

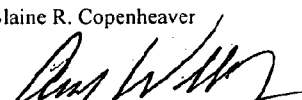


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## INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. <i>G10C 3/12</i> (2006.01) <i>G10C 3/16</i> (2006.01)		
US Cl. 84/236 84/243 84/433		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI, Espacé, USPTO with IPC marks and keywords including piano, pin, key, action, hardened, aluminium, anodised, oxidised, friction, corrosion, etc. Google Scholar search using similar keywords.		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5035168 A (WILLIAMS et al.) 30 July 1991 - See whole document, in particular see the abstract, figs. 2, 6, 10-11, column 3 lines 40-54, column 4 lines 46-51	1-6, 13-18
Y	US 4386455 A (DRASCHE) 7 June 1983 - See whole document, in particular see figures 1-5, column 1 lines 11-16 and 45, column 5 lines 1-35, column 7 lines 40-51	7-18
Y	Hardcoat Anodizing [Online]. Aluminum Anodizers Council, 16 May 2000 [retrieved on 10 December 2007]. Retrieved from the Internet: <URL:http://web.archive.org/web/20000516171324/http://anodizing.org/hcwebdoc.htm> - See whole document	1-18
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex		
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	
"P" document published prior to the international filing date but later than the priority date claimed		
Date of the actual completion of the international search 10 December 2007	Date of mailing of the international search report <b>26 MAR 2008</b>	
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer:  Blaine R. Copenheaver Helpdesk: 571-272-4300 PCT OSP: 571-272-7774 	

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International application No.

PCT/US2007/071591

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4920847 A (CONKLIN, JR.) 1 May 1990 - See whole document, in particular see figs. 1-7, column 3 lines 1-5, column 8 lines 33-34, column 10 lines 38-60, column 12 lines 11-13 and 47-52, column 18 lines 25-44	1-18
A	US 5471902 A (CHAPLIN) 5 December 1995 - See whole document, in particular see fig. 1, column 4 lines 18-20, column 5 lines 10-12	1-18
A	GB 1488782 A (STEINWAY & SONS) 12 October 1977 - See whole document, in particular see page 1 column 1 lines 12-35, page 3 column 1 lines 19-24 and 37-62, figs. 1 and 2	1-18
A	EP 1622126 A1 (KABUSHIKI KAISHA KAWAI GAKKI) 1 February 2006 - See whole document in particular see paragraphs [0003], [0006], [0025], figs. 1-3	1-18
<p>Note: For the Y indications D1 (Williams et al.) can be combined with D3 (Hardcoat Anodizing) for claims 1-6. D2 (Drasche) can be combined with D3 (Hardcoat Anodizing) for claims 7-12. D1, D2 and D3 can be combined for claims 13-18.</p>		

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2007/071591**

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. These particulars are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	5035168	NONE					
US	4386455	NONE					
US	4920847	NONE					
US	5471902	AU	16689/95	BR	9506600	CA	2183956
		CN	1146253	CZ	9602427	EP	0746841
		WO	9522815				
GB	1488782	DE	2603356	JP	51115812	US	3942403
EP	1622126	CN	1728233	JP	2006039253	US	2006021490
END OF ANNEX							