Spanish Clavichord [illegible] by Richard Wynn, West Redding

Description:

Marks: Marks on the inner left side of the tool box, the key levers of f^1 and $f\#^1$, on the "second soundboard" below the key levers of d^1 and $d\#^1$ and in several places inside the instrument (Heyde) look like an old German "d" or a Latin "p". These signs could be marks of the builder, showing him the right positions of several pieces of wood, before fixing them in the instrument.

Case dimentions: spine: 1050 mm (bottom), 1050 mm (top).
front wall: 1052 mm (bottom), 1052 mm (top), 1058 mm (with moulding).
tool box width: 72 mm, 68 mm considering the notch for fallboard.
soundboard compartment width: 276 mm, 272 mm considering the notch for fallboard.
remaining width for keyboard: 704 mm, 713 mm considering the notch
right side: 353 mm (bottom), 352 mm (top)
left side: 354 mm (bottom), 355 mm (top)
depth of tool box: 209 mm
position of nameboard inset from front: 118 mm (left), 118 mm (right).
height of instrument including bottom board: 114 - 115 mm
height of instrument including bottom board and lid: 124 - 125 mm.
height of walls: 97 mm.
visible height of instrument (without concave carving of bottom board): 107 mm.

Bottom board: Two layers of pine, upper layer with grains parallel to the side walls, 9 mm thick, lower layer with grains parallel to the spine, 7 mm thick, chamfered at the edge. Brace at front below key fronts, 61 mm broad, 30 mm high, nailed to bottom board. (Further braces under soundboard see sketch by Heyde).

Walls: Cedar, standing on the upper layer of the bottom board, nailed to both layers of bottom board with hand forged iron nails. Dovetailed tenons, mitred at top. Spine and guiding rail for key levers of one piece, extending to right wall and also serving as soundboard support, 24 mm thick, on top cut down 24 mm to leave an 11 mm shelf for the 2.5 mm cap of the hitchpin rail. Thickness of remaining walls 11 mm.

Tool box: On the left of the keyboard. Tool box lid (pivoted at front) with protruding integral stick, fitting in 6 notches of the main lid, keeping it open.

Hitchpin rail: At the back forming a part of the spine (see above) with beech cap, 2.5 mm thick, 14 mm broad, height above "second soundboard" 39 mm, on the left side replaced hitchpin block of fruitwood, 46 mm broad. The original hitchpin block on the left was probably connected with the spine and the rear wall of the tool box by tenons, which are still visible, three tenons on the spine, two tenons on the rear wall of the tool box, extending to the left wall. The hitchpin block was probably also connected with the left wall by at least 10 dowels.

Hitchpins on replaced hitchpin block of iron, Ø 1.8 mm; on original hitchpin rail in front of the spine mainly of brass, Ø 0.9 mm, and some replaced hitchpins.

Wrestplank: Straight along right side without angle, maple (?), approximately 55 mm broad, without direct connection to the bottom board, starting 43 mm above upper layer of bottom board. Four rows of unpierced iron tuning pins, flatted on top, Ø 4.7 - 4.2 mm (bass - treble).

Belly rail: Cedar, straight, 11 mm thick, reaching from the front wall to the spine. Connected to the spine by one tenon. At the front wall there are no tenons visible but a mitre at the top. Belly rail does not extend to bottom board, starting 37 mm above it (see sketch by Heyde). Mouschole in front of balance rail in the shape of a slight curve. Behind the balance rail the soundboard compartment is open to the space below the "second soundboard".

Soundboard: Fir or spruce, grain parallel to spine, at belly rail 3 - 3.5 mm thick (back - front). No ribs, no rose, 70 mm above upper bottom board.

Soundboard bridge: Beech, four straight pieces joined together with tenons, concave ends, 10 mm broad. The bridge is 10 mm broad and 10 - 9 mm high. One row of brass pins, Ø 0.9 mm, not arranged in groups. The joints of the bridge are at the following notes:
c^1, h^1, f^2 (begun with first pair of strings in bass).

"Second soundboard": There is a second plate of fir or spruce under the key tails with grain parallel to the spine, of approximately the same thickness as the soundboard, attached to the lower edge of the belly rail (see sketch by Heyde) and the back of the lower layer of the balance rail (see below).

Gauge numbers: None.

Fretting system: C to c^1 unfretted, the remaining notes consequently fretted in pairs of two:
$c\#^1$-d^1, $d\#^1$-e^1, f^1-$f\#^1$, g^1-$g\#^1$, a^1-$a\#^1$, b^1-c^2,
$c\#^2$-d^2, $d\#^2$-e^2, f^2-$f\#^2$, g^2-$g\#^2$, a^2-$a\#^2$, b^2-c^3,
$c\#^3$-d^3.
Size of fretted pairs in cents (begun with first pair of strings in the bass / begun with second pair of strings in the bass):

	c^1	c^2	c^3
c#-d	95,8 / 106,8	85,6 / 84,5	214,4 / 180,6
d#-e	93,4 / 93,1	123,7 / 104,9	
f-f#	85,3 / 80,1	90,3 / 86,3	
g-g#	76,5 / 80,3	113,2 / 96,5	
a-a#	104,9 / 110,9	115,9 / 121,1	
b-c	88,8 / 97,3	104,0/109,9	

Correct fretting is only achieved by putting the tangents on different places on the key levers not by bending the keys. The tangent positions show clearly the above mentioned fretting system. This requires 38 pairs if strings, but actually there are 39 pairs. Guiding slots of the key levers do not coincide with the positions of the tangents.

Scaling: Two strings per note. Because of the above mentioned difference of needed and actually existing string pairs, there are two kinds of measurements possible. The differences of both systems occur mostly in the fretted area. In the unfetted part the bridge is nearly parallel to the side walls, and therefore the differences of both measurements are very small.
(First measurement beginning with the first pair of stings in the bass, second measurement beginning with the second pair of strings in the bass, both strings of a pair have been measured in mm):

C	849/848	847/847
C#	832/831	833/832
D	818/817	818/817
D#	801/800	800/799
E	790/789	788/787
F	776/775	776/774
F#	762/761	760/759
G	745/744	743/743
G#	731/730	729/728
A	716/715	715/714
A#	700/700	698/698
B	688/688	688/688
c	676/675	675/675
c#	658/658	658/658
d	643/643	642/642
d#	628/627	627/626
e	616/615	615/614
f	599/598	597/598
f#	587/586	585/585
g	571/570	570/570
g#	556/556	556/555
a	542/542	542/542
a#	528/528	528/528
b	513/513	513/513
c^1	500/498	493/485
$c\#^1$	483/476	468/460
d^1	457/449	440/443
$d\#^1$	438/430	420/413
e^1	415/408	398/392
f^1	395/384	376/369
$f\#^1$	376/366	359/351
g^1	347/339	331/322
$g\#^1$	332/323	316/307
a^1	306/297	290/284
$a\#^1$	288/278	272/267
b^1	260/255	256/257
c^2	247/241	242/243
$c\#^2$	228/229	231/232
d^2	217/219	220/221
$d\#^2$	203/204	204/208
e^2	183/190	192/196
f^2	177/181	185/189
$f\#^2$	168/172	176/180
g^2	158/162	166/171
$g\#^2$	148/152	157/162
a^2	139/143	148/152
$a\#^2$	130/135	138/143
b^2	120/124	130/134
c^3	113/118	122/127
$c\#^3$	103/107	111/116
d^3	91/96	100/105

Tangent positions are measured as they are now, not in perpendicular position, because such a position might not have been intended by the maker.
Changes of tangent positions (visible holes next to the tangents on the key levers):
C 2 mm on the right of the tangent

C#	2 mm	on the	left	"	"	"		
D	2 mm	"	"	"	"	"	"	
D#	3 mm	"	"	"	"	"	"	
E	2 mm	on the	right	"	"	"		
F	4 mm	"	"	"	"	"	"	
F#	2 mm	"	"	"	"	"	"	
e	2 mm	"	"	"	"	"	"	
g	1 mm	"	"	"	"	"	"	
a^2	2 mm	"	"	"	"	"	"	

Balance rail: Two pieces of pine, lower piece 31 mm high, upper piece 12 mm high and 36 mm broad. The lower piece is extending to the back, serving as supporter of the "second soundboard". Position of balance rail: 106 mm behind the back of the front wall. The lower layer of the balance rail is nailed to both layers of the bottom board with hand forged nails. Two rows of brass balance pins, Ø 2.1 mm, upper layer of balance rail chamfered in front and behind the balance pins. Cloth not original.

Key guiding: Key levers are guided in slots of broader spine section below the hitchpin rail. The slots are at equal distances. At the back of the key levers guiding pins of palisander (???), appoximately in the middle of each key lever. In front of the key guiding rail two layers of green cloth, lower layer old, glued on top of the "second soundboard".

Keys: Compass C to d^3
Key levers cedar, 12,5 mm thick, key board sections were joined together with dowels before cutting the key levers, and chamfered at front edge of the sharps and the natural keys between the sharps. All key levers are straight and don´t have "clavichord-like" chamfers at the top. Two scribe lines on key levers for each balance point and the place, where the numbers are written (slanting lines), and the front end of the key guiding pins. The key levers are numbered in ink.
The key covers of the natural keys are of bone in two pieces, 2 mm thick, the key fronts are of bone and ebony in a rhombe pattern. One scribe line in front of the sharps, edges slightly rounded. The sharp keys are of palisander (???), plated with ebony at the top and the front, inlaid with bone in a pattern also found on Spanish organs [reference!]. The workmanship of the inlays is very irregular. The sharps are 11 - 9 mm high (front - back)and 65 - 62 mm long (bottom - top).
Stichmaß: 489 - 490 mm, octave span: 162 - 164 mm.
Width of individual key levers in mm: Natural keys at the front piece 22 mm (slightly differing), at the back:

c	d	e	f	g	a	b
12,1	12,2	12,1	12,0	11,9	12,1	12,0

(exceptions: a^1 11,2 mm, b 11,5 mm, and h^2 12,4 mm).

c#	d#	f#	g#	a#
12,5	12,5	11,5	11,5	11,8

span from c# to d# 43 mm, span from f# to b 66 mm.
(avarages of measurements, actual measurements are not very homogeneous).

Length of key levers 313 - 314 mm (C - d^3), balance point at 112 mm, distance from balance pin to tangent 114 - 188 mm (C - d^3), length of natural key covers: front plate 35 mm, whole length to nameboard 102 mm.

Tangents: Brass, 1 mm thick, at the top approximately 5 mm broad (different measurements). No bending or flattening at the top for overspun strings. No scribe lines showing tangent positions on the key levers. To get the right distances for the fretting, the tangents are set on different positions on the key levers, not in the middle, but sometimes on the very edges. To achieve the right tangent positions on the strings many of the tangents are bent, not perpendicular.

Dampers: No cloth damping or damper rail. Two pieces of palisander screwed on the spine, not original, probably fixed a damper rail at one time.

Lid, front board and nameboard: Lid cedar, three pieces, above keyboard divided to cover the soundboard separately. Fall board hinged to the front wall. Nameboard not original, shape of intersertion < >.

Hinges: Brass. Three hinges between lid and spine, and fall board and the front wall, five hinges holding the parts of the lid together. Iron lock on the fall board. Lock plate of brass.

Mouldings: Mouldings covering both layers of the bottom board and surrounding the soundboard on the walls and the hitchpin rail on the spine (channeled). No mouldings on the top of the walls.

Alterations:

So far the wood carving on the outsides of the walls and the lid has been supposed to be not original. Irregularities of the carving at the positions of the hinges seem to prove this assumption. The carving could have been made later to make the instrument looking older as it actually is. Also the painting at the inner side of the lid is not original. Alterations seem to be made also at the hitchpin block on the left. The tenons of the hithpin block on the spine and the rear wall of the tool box don't find a continuation to the present hitchpin block. Therefore the original hitchpin block could have been cut out, leaving the original tenons on their old places in the instrument. Marks of later cutting are visible on the key guiding rail, which is part of the spine, the spine and the moulding on top of the hitchpin rail. Beside that the fruitwood of the hitchpin block is nowhere else found in the instrument. In front of the spine some hitchpin alterations can be observed:

- d^1 closed hole on the right of the [?] hitchpin.
- $f\#^1$ first hitchpin 1 mm on the left of its original position.
- $g\#^1$ replaced first hitchpin 5 mm on the left of the probably original position.
- d^3 two hitchpins instead of one for the first hitchpin.

Considerations on the construction and the historical place of the instrument:

The Spanish clavichord described here shows some contradictions, which make it difficult to determine its right place in the history of clavichord building, and also to imagine the position of its maker in the world of carpenters or builders of musical instruments. Some features show clearly, that the man who made the instrument was a good cabinetmaker. The complicated joints connecing the pieces of spine, hitchpin rail, hitchpin block and tool box require a well trained carpentier. The use of a bottom board in two layers, as is usual for square pianos in the early 19th. century, lets us assume, that he was well aware of the effects string tension can have on the instrument´s corpus and how damage could be avoided. Otherwise the construction of the wrestplank is very weak in lacking a direct connection to the bottom board, and the balance rail has no hardwood, carrying the balance pins. Also the fact that the walls are standing on top of the upper layer of the bottom board, instead of on top of the lower layer, shows that the construction of the instrument was thought-out in some way, but not in the best.
A clear anachronism is the use of a "second soundboard" under the key levers. This device has been derived from 15th-century clavichords with a low soundboard, covering the whole inside of the instrument and protruding also below the key levers. Such a clavichord is found for example in the intarsia at the palace in Urbino [reference!]. A "second soundboard" under the keys in the way of the clavichord owned by Wyton is also found in a clavichord of the first half of the 17th century (Deutsches Museum, München). Some 18th-century clavichords built in South America and a clavichord in the Händel Haus, Halle, show also this feature [see Beryl Kenyon de Pascal, Heyde].
Beside this the instrument shows features, which could be interpreted as deviations from the normal tradition of clavichord building. The shape of the soundboard bridge and the use of straight key levers in a fretted clavichord can be considered as such. The bridge probably has been made of straight pieces, because this is easier to make, but this again contradicts the obviously good training in cabinet making of the builder. The same is true for the straight key levers., which seem to have been introduced by Carl Lemme, who declares at second of November 1780 the following improvement as his own:
1) The key levers of my unfretted clavichords are mostly straight. The touch is therefore lighter and faster, and also the duration of the keys is improved.
[*1) Die in der Claviatur der Bundfreyen, wo nunmehro fast alle Claves gerade gehen, und dadurch sowohl ein leichterer und schnellerer Anschlag, als auch die Dauerhaftigkeit der Claves selbst, bewürket wird.* Johann Georg Meusel, Miscellaneen artistischen Innhalts, sechstes Heft, Erfurt 1781, S. 45].
But Boalch points out, that the advantages of this improvement are doubtful, because careful workmanship can produce excellent touch and durability in resonably crooked keys. And also such a straightening could be attained only at the expense of either the string-scaling or the good position of the bridge on the soundboard [Boalch 1974, S. 100]. Forthermore this feature is only useful for unfretted clavichords, not for fretted ones. As a result of the straight keys this fretted clavichord was not constructed as normal. Already Arnault de Zwolle described, that in a fretted clavichord usually the

positions of the tangents are equal to the positions of the guiding slots for the key levers. So the different construction of the present instrument seems to show, that the maker was not familiar with the regular way of building fretted clavichords. Also the fretting system of the instrument is quite unusual, although not completely unknown in the history of clavichord building. The straight key levers require a large number of unfretted keys in the bass, where fretting distances can't be achieved by straight key levers. Therefore fretting first occurs between $c\#^1$ and d^1 and then continues adjacent in double frettings. Double fretting without unfretted keys between is quite rare, but appears in some German clavichords of the middle of the 18th. century (Münchner Stadtmuseum, 82-2) and are also described by Andreas Werckmeister. He mentions in *Die Nothwendigsten Anmerkungen und Regeln wie der Bassus Continuus oder General-Baß wol könne tractieret werde*, Aschersleben 1698, S. 67, a fretting system with double fretting (c-c#, d-d#, e-f, f#-g, g#-a, a#-h). The question why a well trained cabinetmaker used straight key levers leads to the assumption, that he did this, because using an organ keyboard.

Despite all these strange features of the present clavichord its scaling, and even the distances of the fretted pairs of strings - at least from c^1 to h^1 - lead to the assumption, that its maker was familiar with the basic principles of string lengths.The scaling of c^1 is approximately twice of the length of c^2, and c^1 is half of it. The fretting seems to be oriented in meantone tuning, at least between c^1 and h^1, where the right place of the tangents is easier to achieve than in the upper octaves. The c^2 of 247 or 242 mm lets us assume a stringing in brass thoughout the compass, probably standing in "Kammerton". The existence of a extra pair of strings however is difficult to explain and represents probably a mistake.

Missing mouldings at the walls and the key levers indicate an origin in the early 19th century, as well as the influence of early 19th century square piano building seen in the construction of the bottom board. Key covers with only one scribe line are also seen more often in the early 19th. century keyboard instruments. A feature usually not found in German clavichords are nails, fixing several parts of the instrument to the bottom board.

Sabine Klaus, September 5th, 1995.