Part II 2009 May 16

The bent side is cut by a ziggsaw. It does not cut a thick board vertically in enough accuracy.. This picture shows how you can shape the bent side vertical with a simple tool. Of course this tool has sandpaper on the part facing the base board.

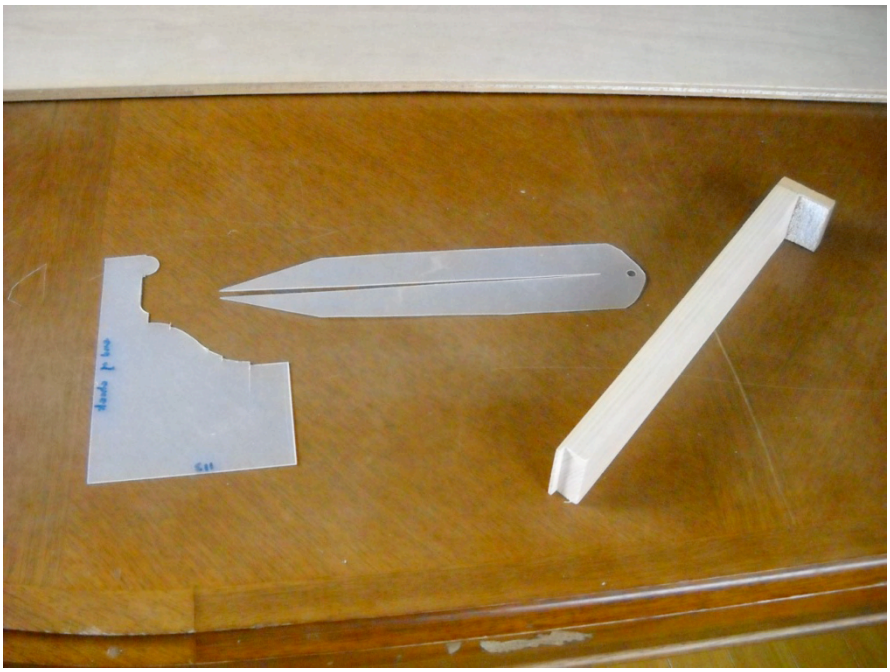
Gluing the bridge on a soundboard.
This is one of the most important work in the harpsichord making. You can choose a fine day after several fine days when the air is dry or you can use a dehumidifier in a small room or a cabinet.
This should be done when the soundboard is most dried and the total width of the soundboard is the narrowest.

This is one of the most difficult work which should be done without any delay. If you use a natural glue from animal, you can achieve a better fit heating over the bridge with a electric heater or a hair dryer. The natural glue will melt again with the heat so long as the glue has water in it.

Gluing soundboard bars

This should be done also when the soundboard is dried (when the total width of the soundboard is the narrowest).

You can see a chamfered part on the soundboard bars where crossing the bridge.



Simple tools

From left to right

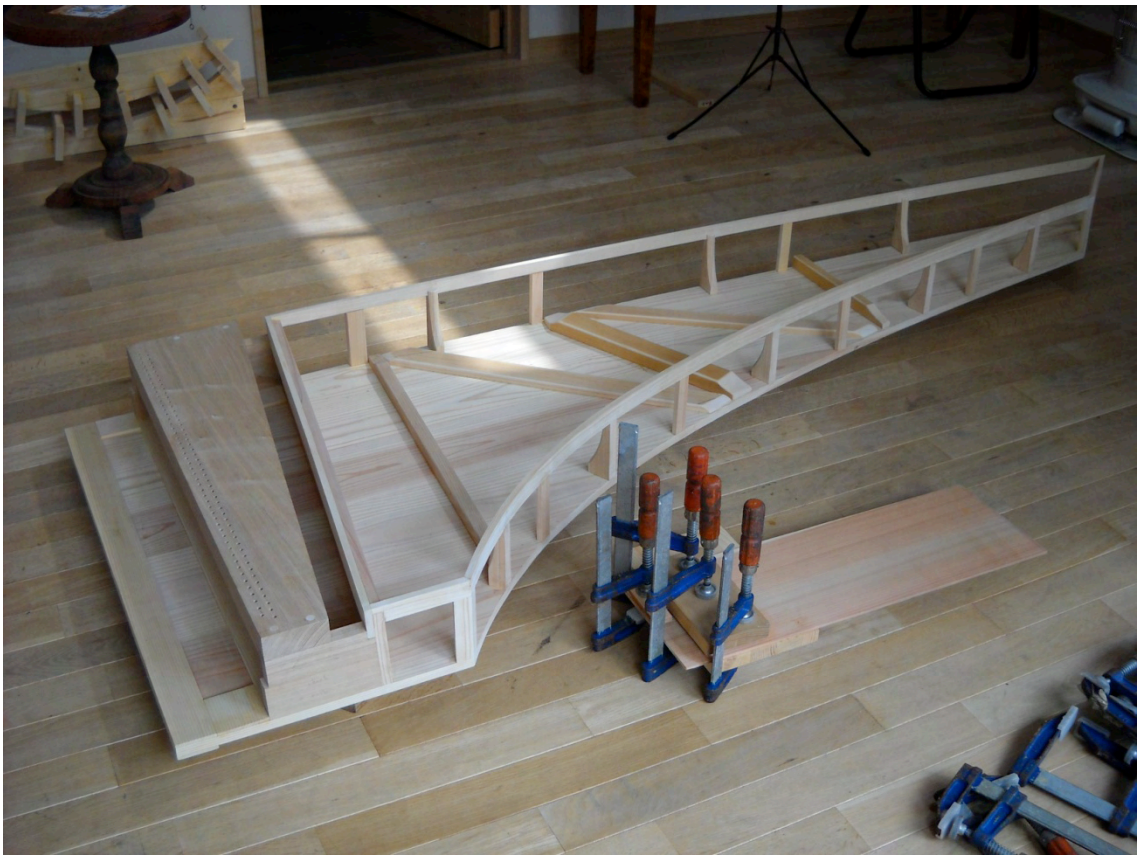
Cheek pattern

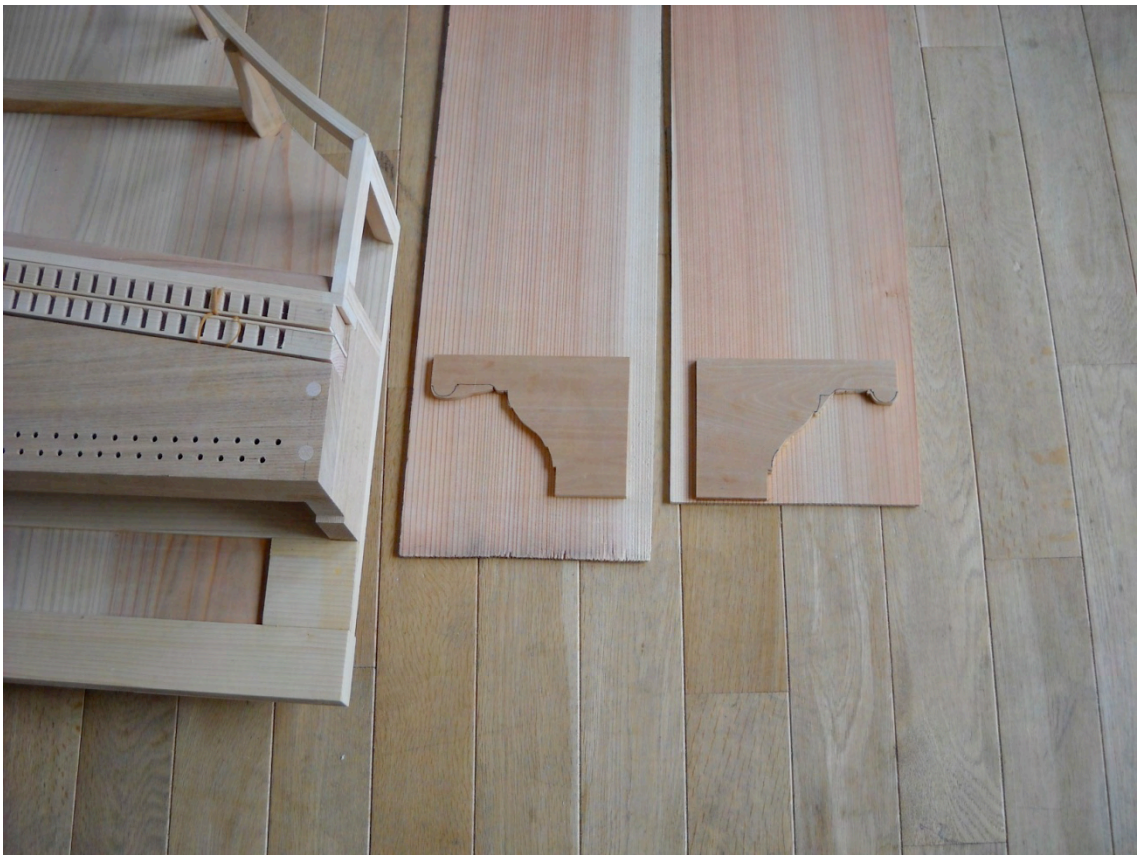
Bridge finder;

Using this finder, you can know the exact position of the bridge from underside of the soundboard. This will be necessary to glue the soundboard bars.

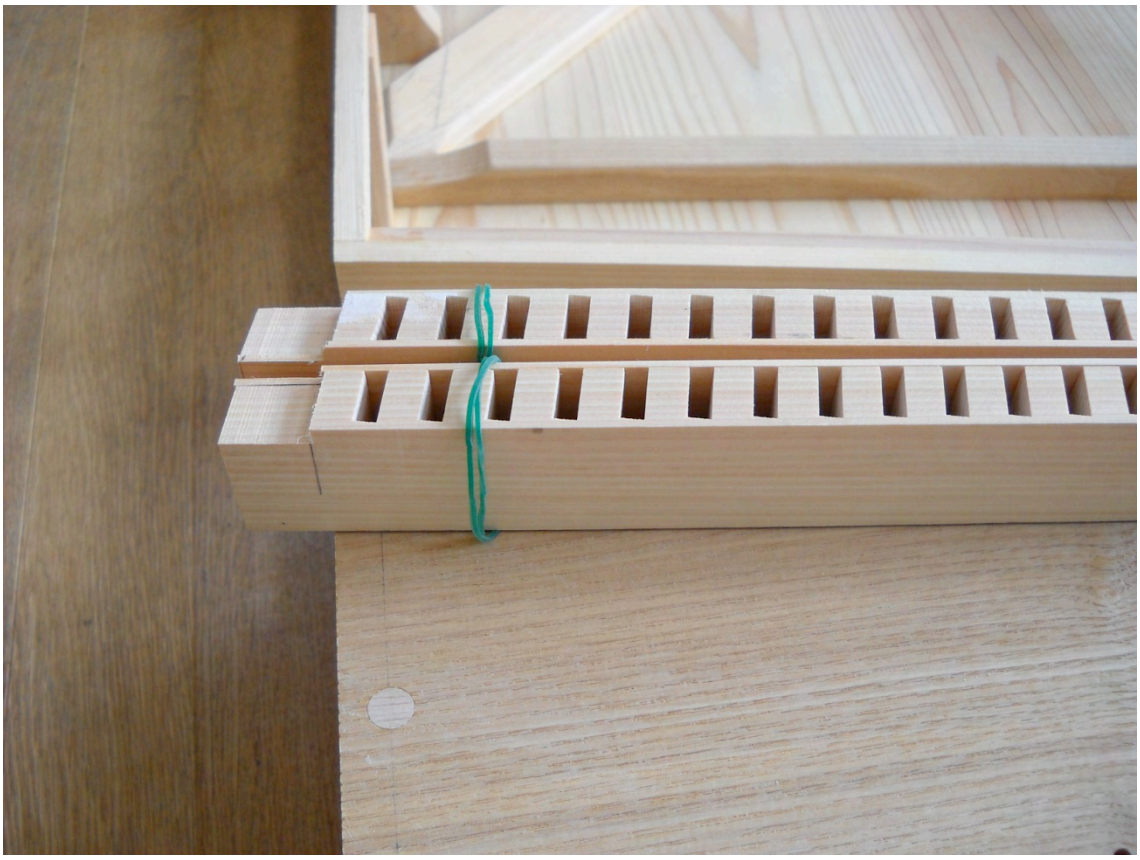
Dresser for base board;

You will see the small piece of sanding paper at the end of this tool.





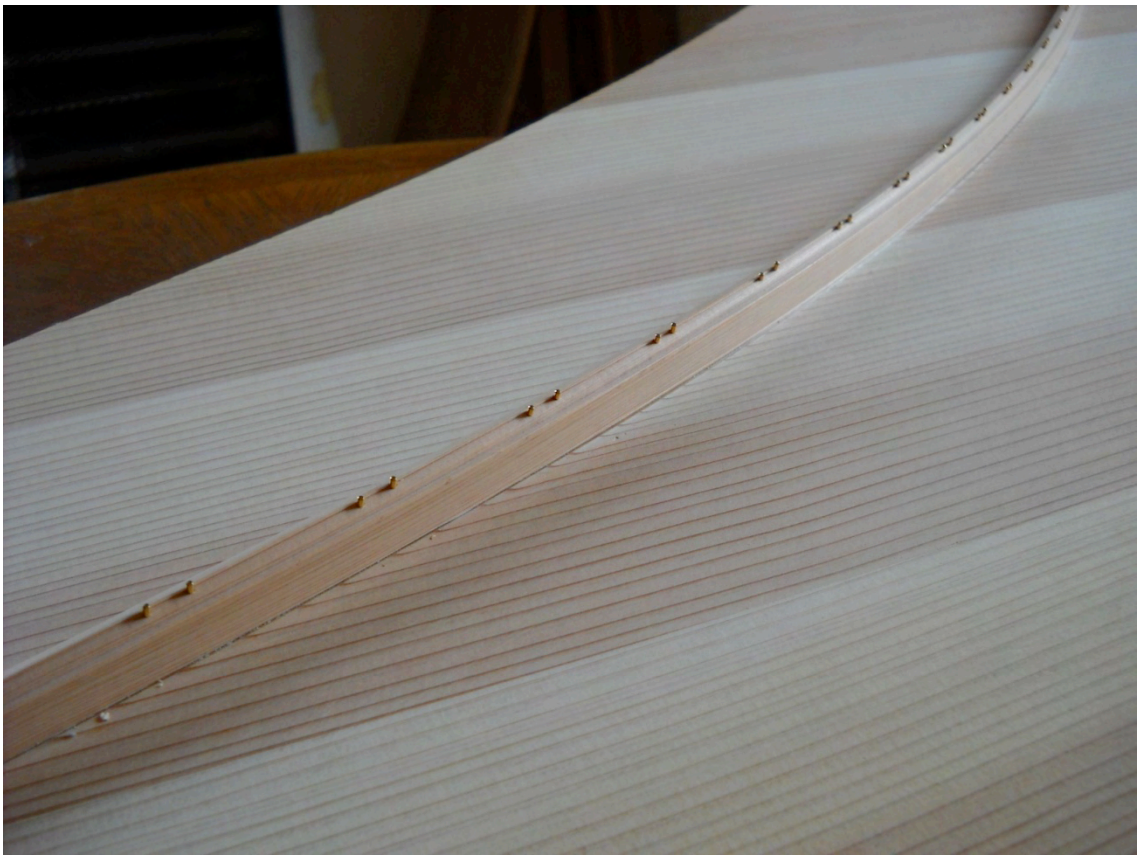
The inner piece of wood (cheek pieces) are roughly cut out and glued to the spine and the cheek side which is a side board of right position of the key board.



At both sides, the bottoms of the box slides have cut off like this which are going to rest on both of the wrest plank supports.

The fronts of spine and the cheek are now trimmed accurately to the pattern.

You can try to move right and left both of the box slide.



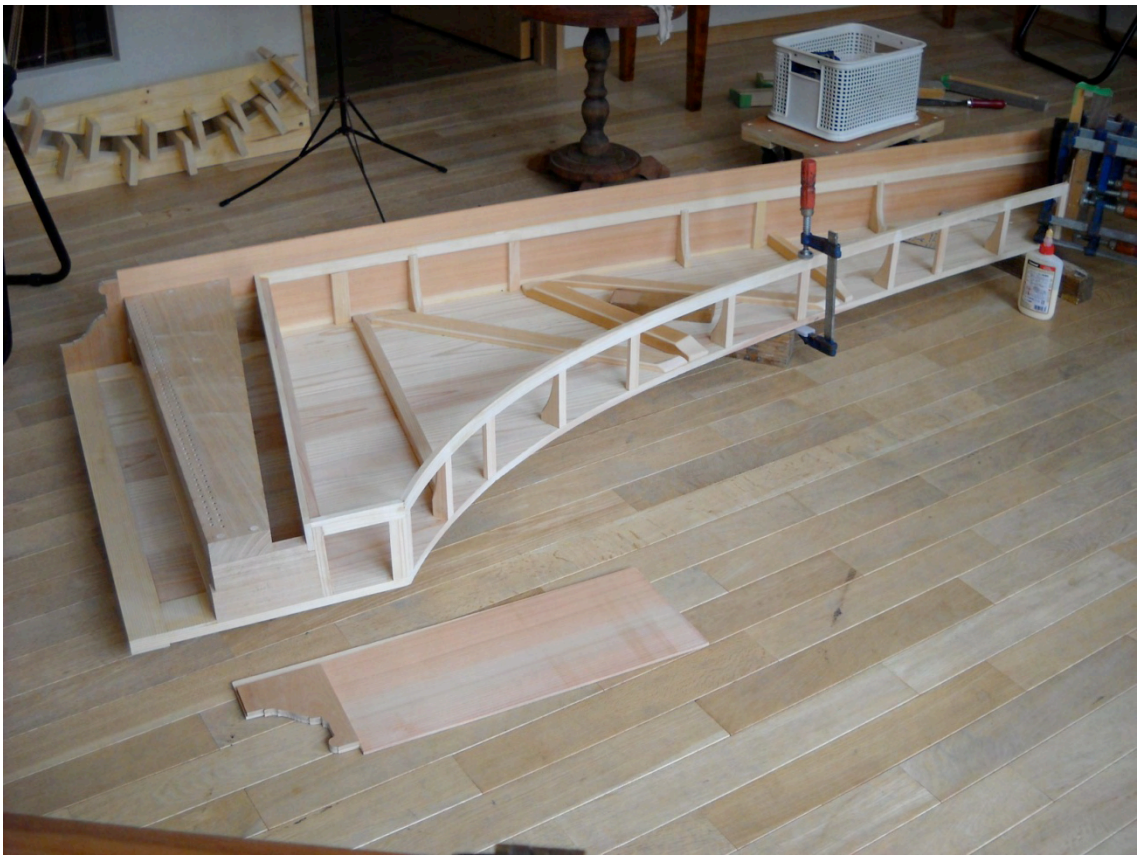
Tap in the bridge pins. You will need to finish the surface of the bridge before doing this.

Cut the soundboard bar in curve with a small saw.

This is a small saw which is used to cut off the excess part of dowels which is glued into a board.

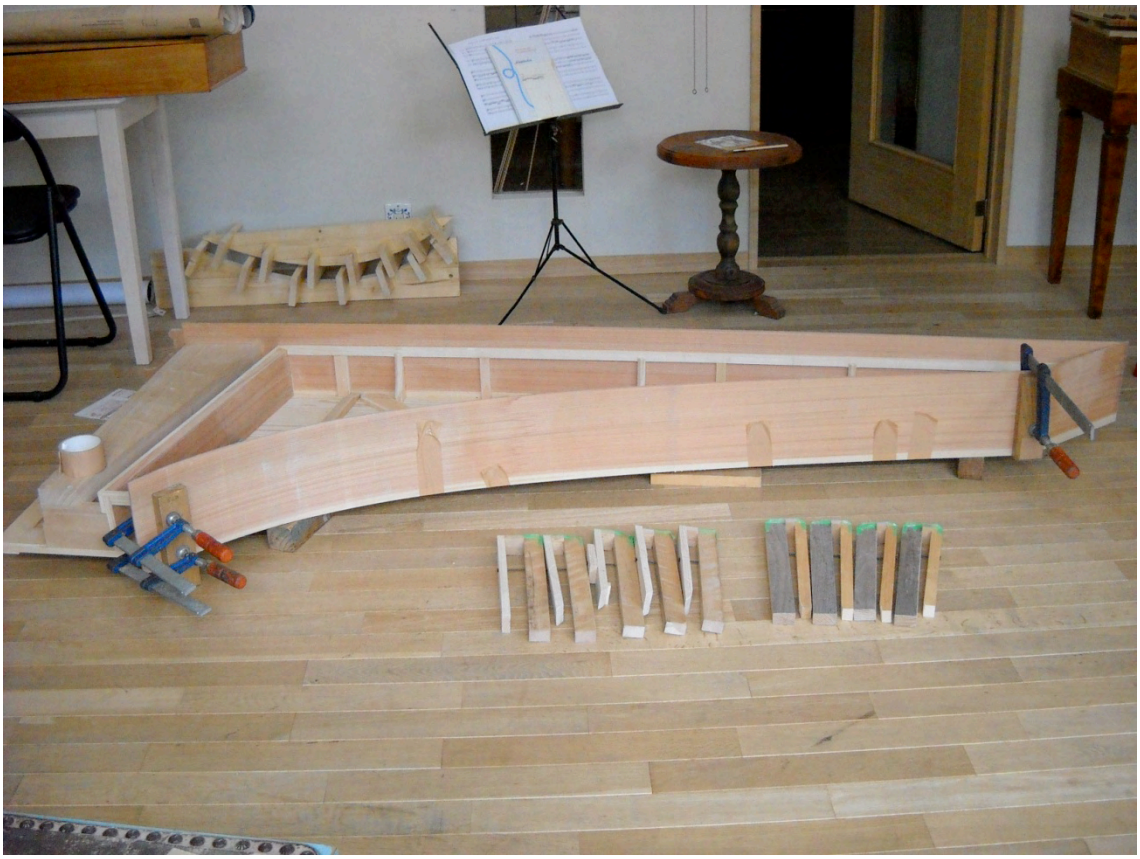
The liners will have several cut off where the soundboard bars are coming in.
In this stage, that is, before case sides are glued, you will be easily adjust the sound board to the frame work. The sound board should be just the size of the frame because the liners are very thin.

You can set the soundboard on the frame work and run a pencil to mark along the liners. Then you can cut carefully according the pencil line. This should be done when the soundboard is dried.



The spine and the tail are glued.

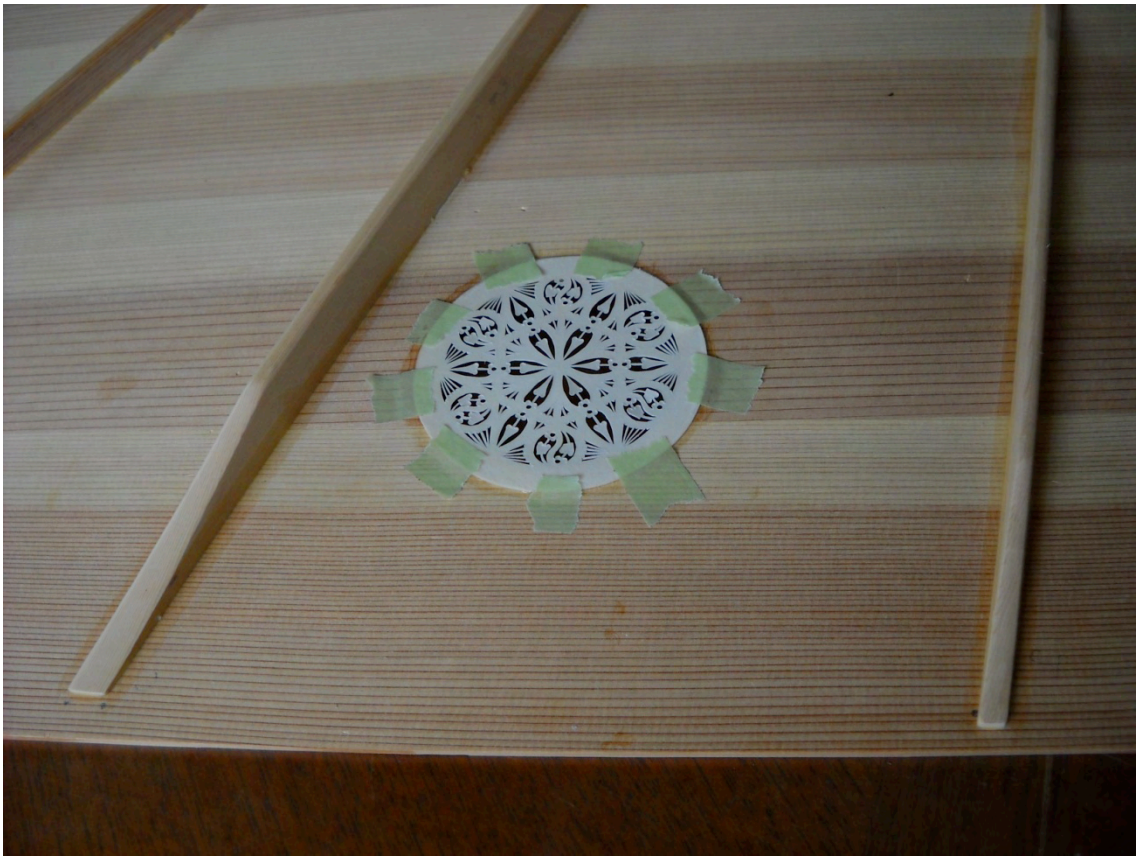
I made several wood clamps to glue the sides which will appear later.



You will see several wooden tools to sandwich the bent side and the knees or blocks. Yet gluing bent side or spine is a most difficult work using modern glue, because it should be completed in several minutes. You have run a dry run, that is, without glue you set all the cramps and the tools and check carefully if you can achieve a good fit. Especially dry run is necessary when you glue a large board like spine or bent side.

As the bent side was curved too sharp, the cheek side was glued the last.
It may be better to glue the cheek side first then glue the bent side if you curved the bent side too sharp.

All the case sides are glued.



Now it is the time to glue the rose if it is going to be glued underside of the sound board. I am going to use a rose in two pieces, one below the soundboard and one on the soundboard. I used instant glue to glue this piece because the excess of glue is not visible.

The wooden pieces for cramping the sound board is prepared and numbered.

Could you see the sanded area of 8mm wide in the right edge of the sound board? You will need to sand with sand paper where glue is applied.　The very smooth part of wood sanded by fine sandpaper does not get a good contact with natural glue.

The front most of the sound board is not glued at this stage, so I applied glue and let it dry. This part can be glued to the upper part of the belly rail later if you use natural glue from animal.

Install a sound board to the instrument.

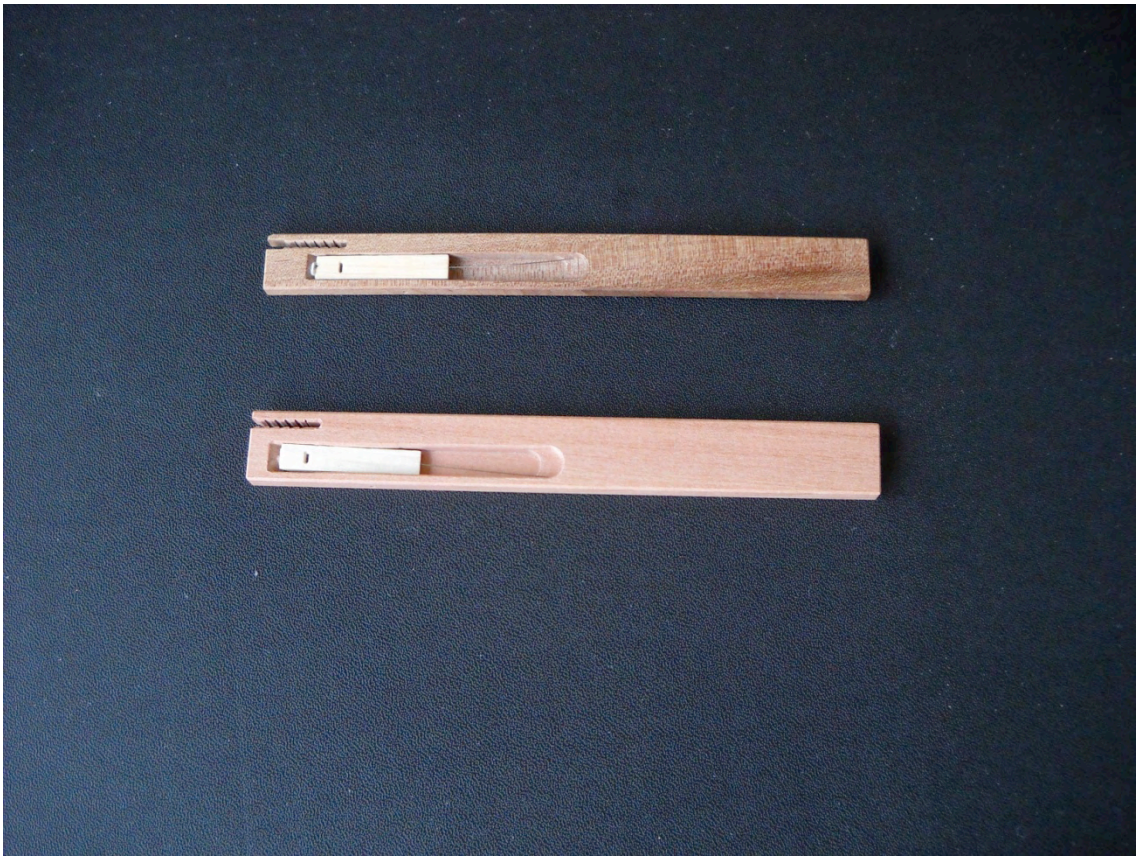
This is also one of the most important work of the harpsichord making. You can choose a fine day after several fine days when the air is dried.

You will need check the item below before you start the installation.

1. The sound board is dried enough. Its width is the shortest.
2. The interior of the instrument is finished neatly.
3. The lower surface of the sound board is finished neatly.
4. The size of the sound board is good enough to rest on all the liners and the belly rail.

I applied glue not only to the frame but also to the sound board. The gluing of the soundboard and the belly rail can be done later if you use natural glue which will melt again by heat so long as it contains water in it.

To glue all around the soundboard may be possible if you have enough clamps and somebody will help you.



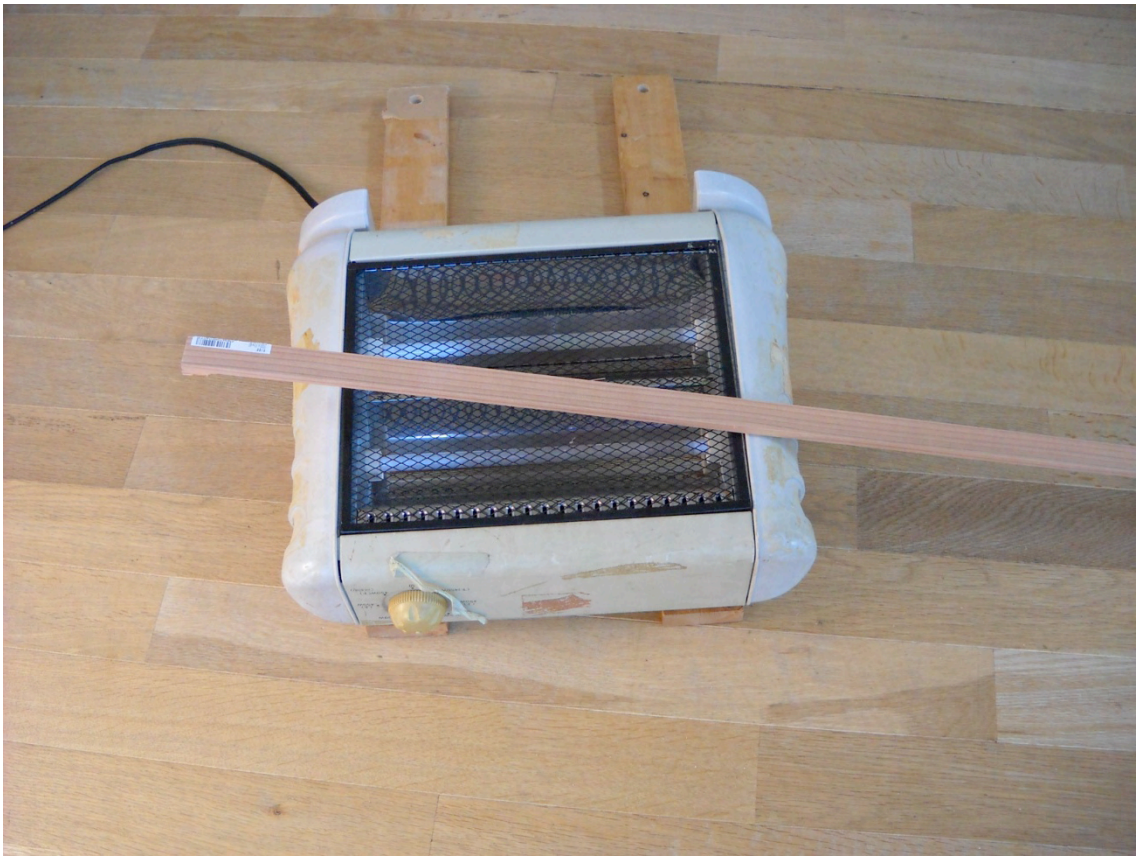
The front large jack is made by Marc Vogel oHG in Germany with special measurement(4.8x14x120, the distance between plectra and the top ; 11mm). The back is the normal size of Christofori jack.

In the Italian instruments the distance between plectra and the top of the jack is very short. This means the height of the case wall above the soundboard should be low. Some instruments have 9mm of the distance. The Christofori jacks have 11mm at the shortest because they have the top adjustment screws, so I have to choose 11mm. This will cause the height of the instrument 2mm higher than the original instrument.

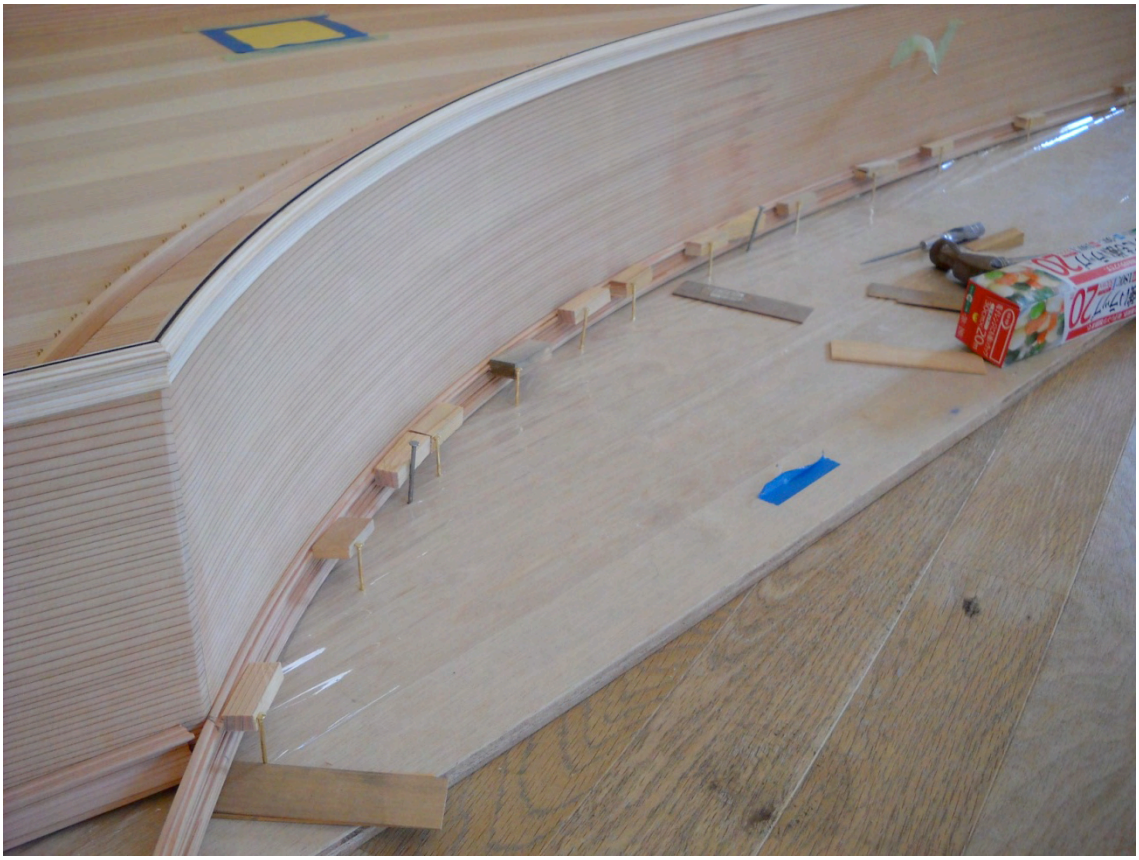
At this stage you may try to string a pair of bass strings to check the action of the key, box slide and the jack. If you limit the movement of the both box slides at this stage, you can set some other jacks at the treble and the middle area with stringing or not stringing.

Now it is the time to make moldings. This photo shows how to make cap molding. Two strips of cedar (white) and a thin strip of ebony (black) is prepared. The ebony strip is actually consists of several short pieces, but if finished you will not see the joint.

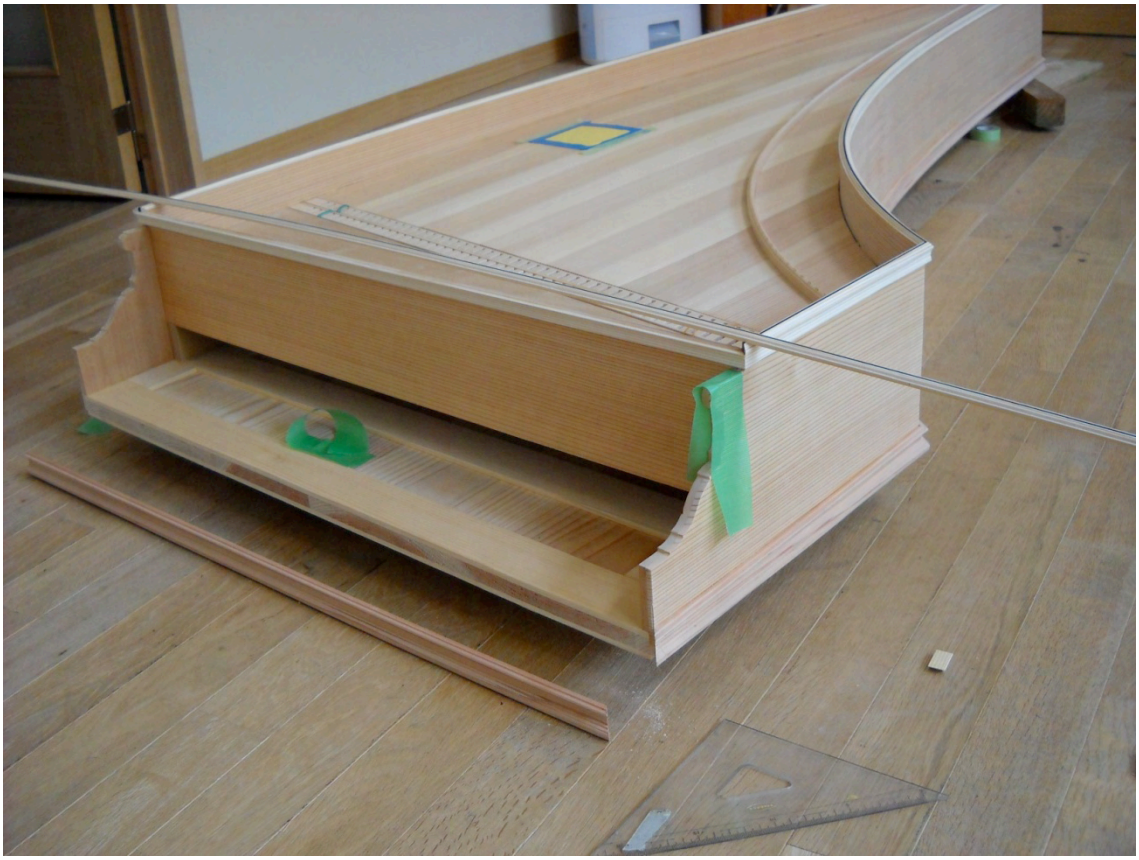
The cap molding of the bent side is simply make like this, using the bent side of the instrument. The width of the cap molding is 12mm, and it may not be curved if you make a straight molding.



The bottom molding may be curbed simply by a electric heater.



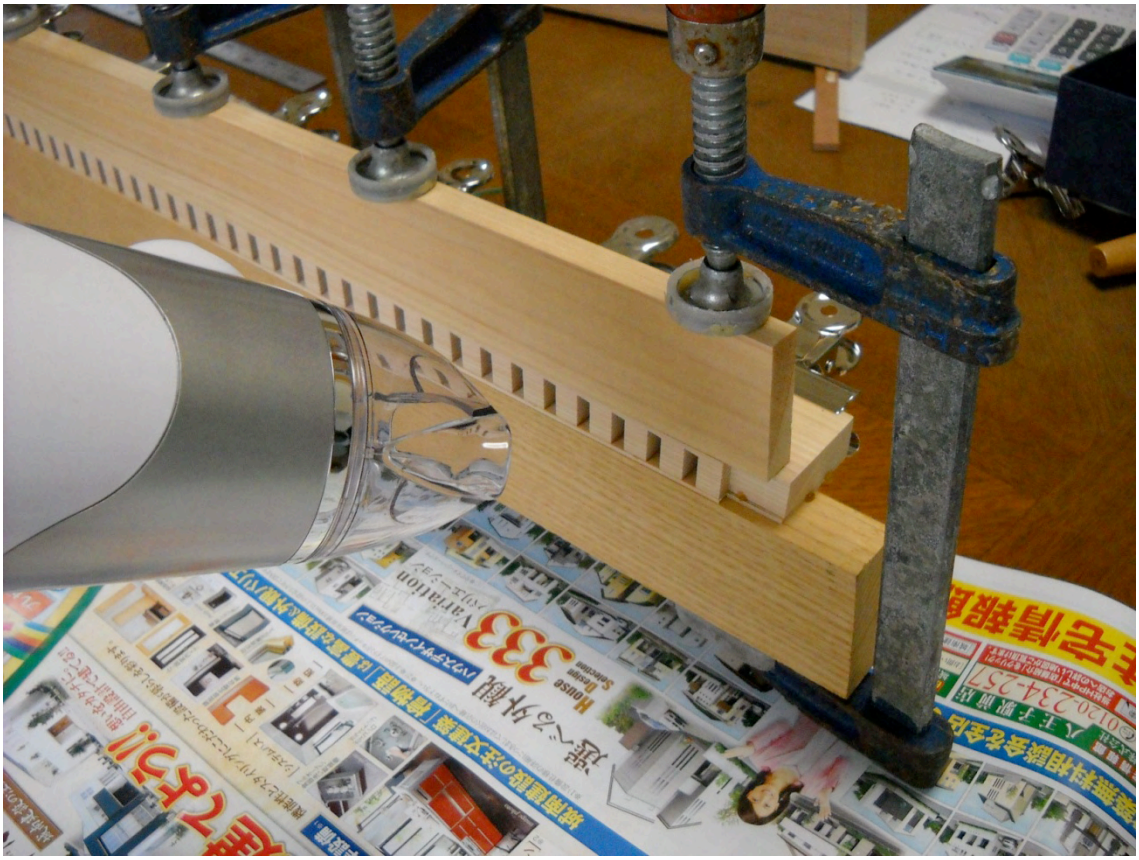
The Bottom molding at the bent side should be pushed to the instrument like this. To do this small piece of wood and nails work pretty good if you work on a working board and the bottom molding is bent previously. The instrument is pushed to the direction of the spine, so you will need to arrange that the instrument will not move.



The cap molding of the name board should be carefully cut out for a good appearance, because the name board is a removable section.

The three at the left are the bars of the sound board, the three at the right are the moldings, bottom molding, top side molding and the cap molding (left to right).

The moldings are finished.



The box slide is made in two part;

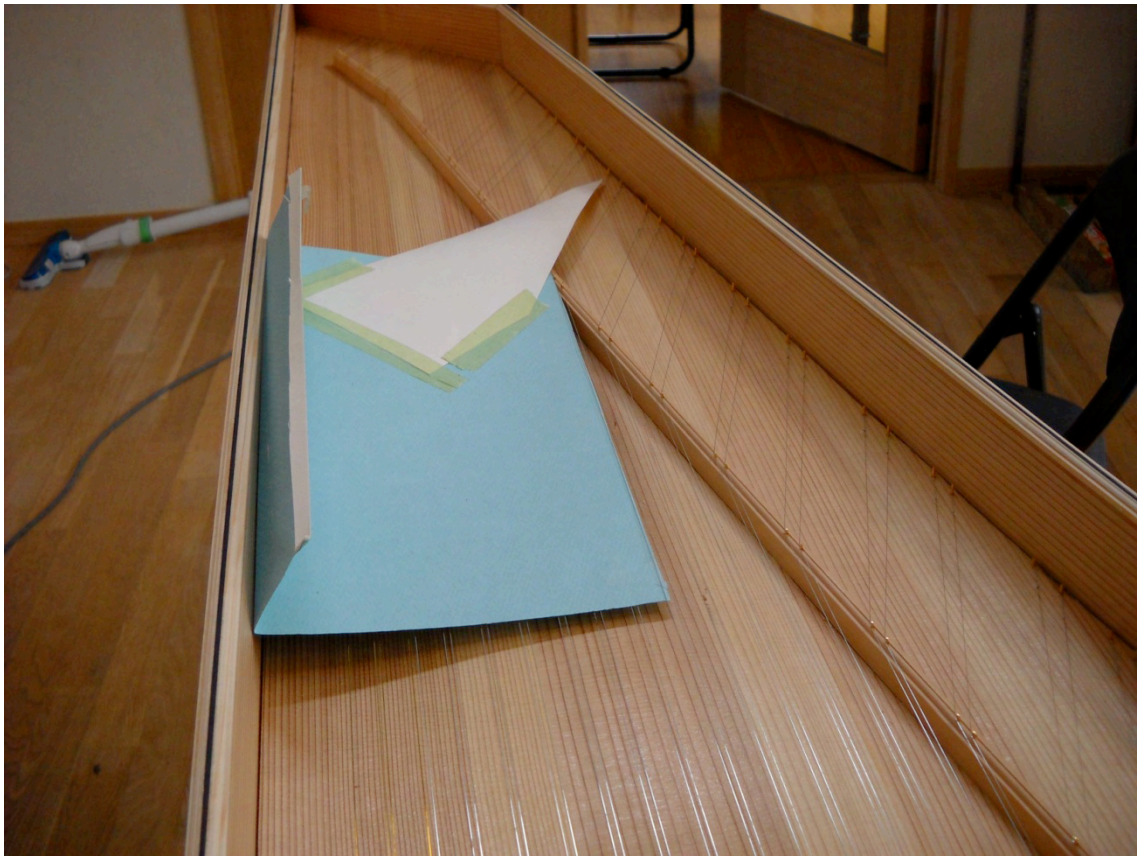
The thick wood strip with mortises for jacks and the thin piece of wood strip. They are glued now with hot glue from animal.

If you are going to this with cold glue, you need to do it very quickly before the glue dries, and it may not successful.

You need to make so called soundboard bridging piece at both end of the gap for the box slides. The height of the box slides is 40mm and the liners, 22 at the spine, 24 at the bent side. The liners are pushed towards the wrest plank, so the bridging pieces are essential if the box slides system is used. The bridging pieces should be fitted into the gap snugly.

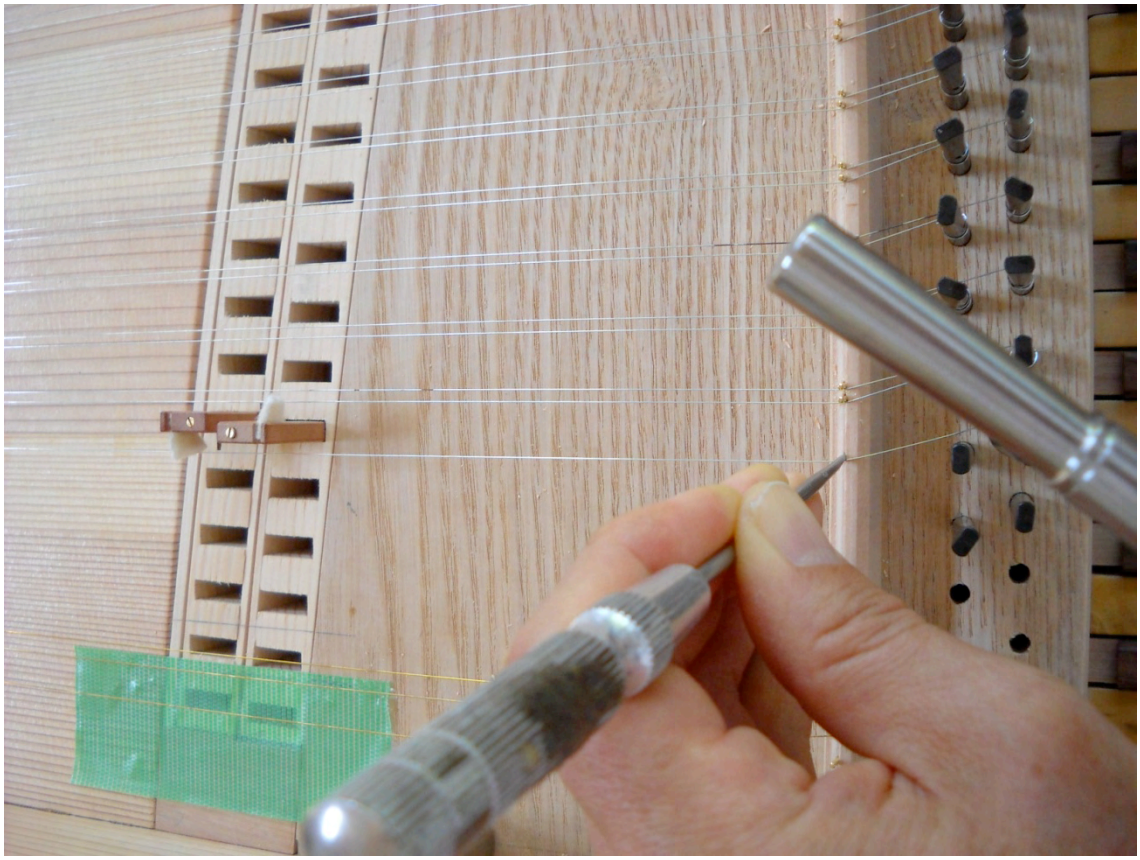
Using two standard jacks you may start stringing from the treble. If you are certain enough of the position of the box slides, you can start from the bass. The holes of the nut pins are drilled now very carefully. You may take great attention to

1 the equal distance between the jacks and the strings
2 the back of the jacks do not touch when the jacks at the front 8' or back 8' are off
3 the two strings between the jacks are not too close which cause the damper felt touch the both strings



This is a simplest hitch pin pointer made by cardboard. Please note the angles so called side bearing are not equal from treble to the base, so you will have to make several cardboard pointers or modify it several times with mending tape.

The hitch pin is bent with a simple tool. You can make this tool with brass plate of very hard wood.



To position the nut pin you can use a point tool like this. The two jacks are the standard jacks to keep the distance between the jack and string equal.

The close up of the bridging piece at the treble end

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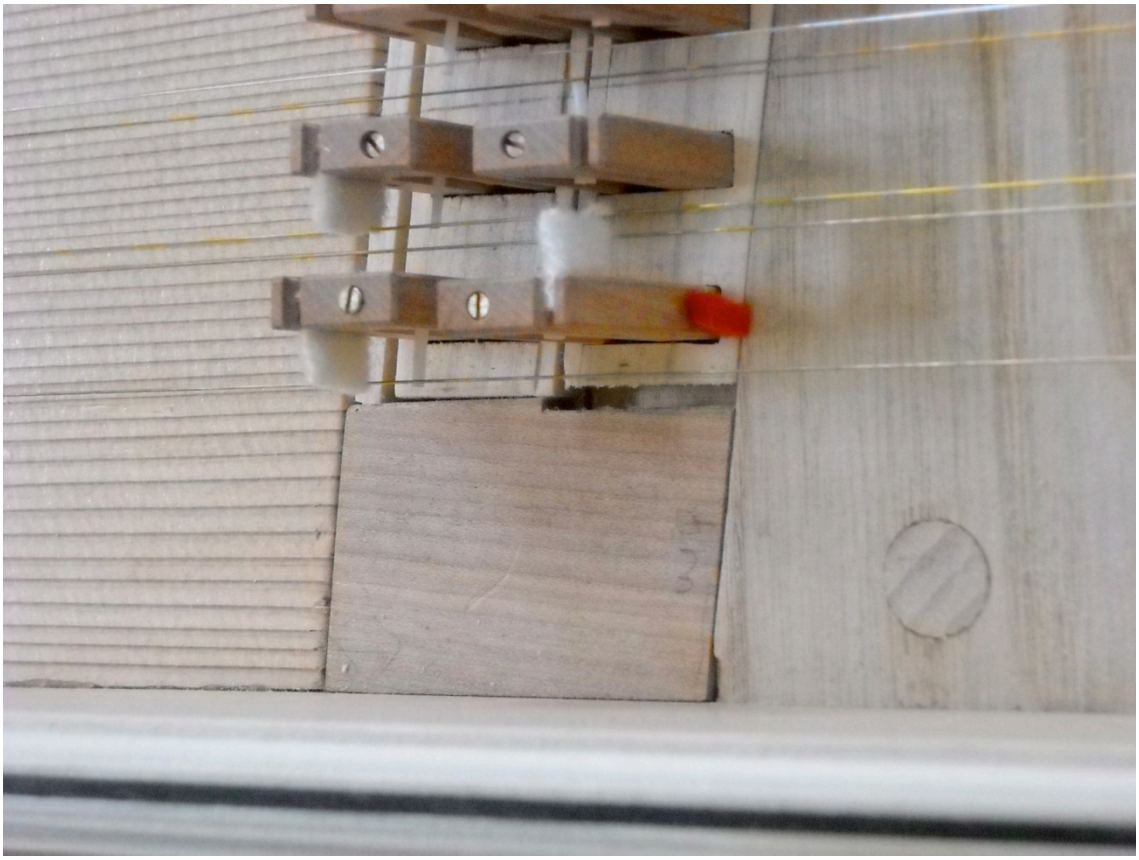
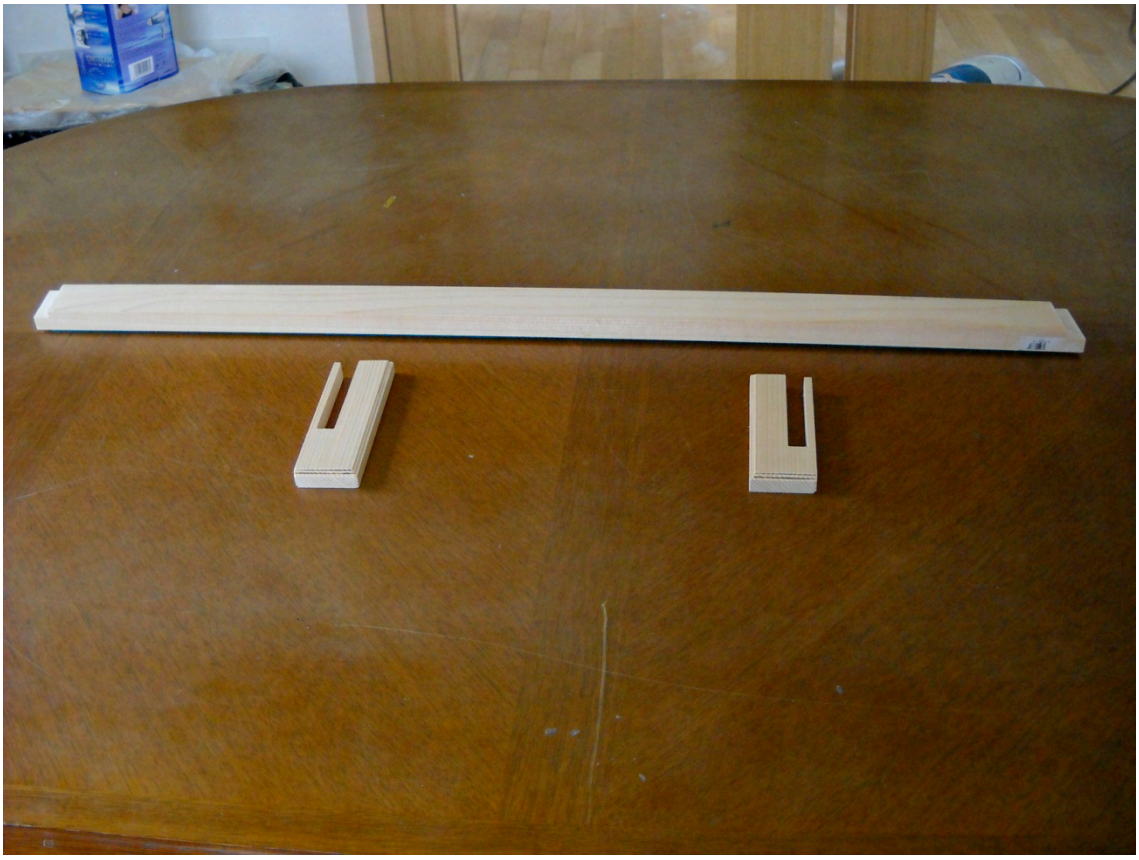


The bridging piece at the bass end. You can see cut out of the bridging piece to get the enough movement of the box slide.

At this stage before putting in the damper felt, you can trim off the plectra of the jacks.



The jack rail and the two jack rail supports are made now. The jack rail is made from a very fine wood which will not warp.