

COMMENTS

ON MECHANICAL MUSIC DIGEST

INTRODUCTION:

Our goal and desire to preserve the value, originality, and integrity of pneumatic musical instruments with as few changes as possible has prompted this special page for comment on subjects and procedures mentioned in recent MMD digests. We intend to examine a few pertinent subjects in detail as they arise whenever possible, and give you another aspect or more details to aid in your conclusions.

We want to help those brave enough to undertake a restoration or repair of their own instrument. Sometimes, because of editorial prerogative exercised on the MMD, full information cannot be had, and other fears and misgivings are seldom expressed, so the information is too often ambiguous and not useful, overall.

Feel free to avail yourself of our own archives library, and please compare what we say here with anything else you find, to make a wiser choice when you proceed. This page is for your benefit, and for the respect and preservation of all pneumatically operated player pianos. They work reliably and for many trouble-free decades when restored correctly. They will fill your home with music, and their music is beyond compare.

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This week's article in question:

From: dat-smc@juno.com.geentroep (Don Teach)

To: rolls@foxtail.com

Date: Fri, 9 Aug 2002 09:44:11 -0500

Subject: Piano Roll Tears While Rewinding

(The comments below were actually quoted from an earlier article by Craig Brougher. Don takes exception to this. The comments in parenthesis are my own, and also the quote marks:)

"I believe that rolls that tear on rewind are caused by a multitude of things, and it's seldom the geometry of the spool box or its components."

"I do not recommend modifying the spool box because you are tearing rolls. I also do not recommend taking off the rewind brake -- on any but the worst players with the worst tracking mechanisms. And I definitely do not recommend shortening the takeup spool."

(Craig's) Comments about coin pianos:

“- Since end plates of the spool frame are extra heavy and precision drilled, often with bushings or bearings installed as well,

- and since rolls are not reliant on small, thin cores with wobbly flanges,

“- and since the rolls are not changed by the pianolist each time it plays, and are not subjected at all to the same wear and tear of rolls which have been played on perhaps a half-dozen old players through their lifetime, losing tabs and being damaged in the process,

“- that's why rolls played on automatic players do not tear up, even though most of them have been played far more times than any ordinary home player roll.”

(Now Don begins speaking)

I have a few questions that these points bring to mind:

Nelson-Wiggen pianos used a wooden spool box, and they track well.

Is it the precision geometry of the spool box or the larger holes in the roll that makes the Nelson-Wiggen not need a tracker mechanism?

Early Wurlitzer instruments used a wooden spool box with a small five-tune roll wound on a wooden spool with wood spool ends (flanges). They also have a small take-up spool with adjustable flanges on the take-up spools. These instruments have small holes in the music roll.

By the way, it was a common math error that gave them their unusual hole spacing. These machines have no tracker and played the rolls more times than any home player and were often used on many different machines as the route operator would take the rolls from one location to another. They tracked well and are usually found with the roll edges intact. Was it the precision of the spool box that prevented these rolls from tearing and tacking well? I know it wasn't the quality of the paper, as it varied from poor to okay.

Every coin piano I have ever seen has flanges on the take-up spool that are adjustable. There were many cutting errors in the coin piano rolls yet they track well, even Coinola rolls with their nine-to-the-inch spacing.

The Reproduco had a model that used small rolls much like a home player piano with no tracker mechanism. I know of no original coin pianos with bearings, other than the Mills machines which were the most precision made of all the coin piano spool frames. There is little

play in them even after 90 years of use.

My question of the day is why not try to improve the geometry of an old player that tears up the rolls? Were they all perfect the day they left the factory?

Don Teach

[I feel that the crude Bakelite and plastic flanges are a big part
[of the problem, because they allow the spool to wobble on the chucks.
[Systems using pin-end spools, such as 58- and 65-note organs and
[pianos and most European player pianos and orchestrions, seem to
[be gentler. -- Robbie

MY ANSWER and SUPPLEMENTAL INFORMATION

Summary: I don't recommend starting to fix your spool box, even the late model Aeolians, by changing the geometry or shortening the take up spool, as Don also suggested in one instance. There's a better way. Remember also that any spool frame is by necessity larger and heavier made than the common spool box used in player pianos for the home. They are also more precision-made and control the paper more exactly, whether made from all metal, or wood and metal. It's immaterial.

By Craig Brougher

Subject: Piano Roll Tears While Rewinding

Don Teach still has misgivings about not changing the geometry and takeup spools of player pianos to make them track. My opinion is that the fault is primarily the rolls and secondarily the tracker that causes rolls to mis-track and tear up, not spool box geometry. And certainly, the last thing one would wish to do is try to track rolls with close takeup spool flanges.

Don is a professional with many years experience in rebuilding and collecting and certainly knows what he's doing, in my opinion. He could modify a spool box and do it right. But he's not telling anyone exactly how he'd do it, and that's because there are too many things that you'd have to do. I don't take that route.

I've been rebuilding players professionally for about 37 years now and have not once had to modify a spool box to get a player to track, nor a takeup spool that was too long. I have put spacers in one or two that were too short. Many players have lightly sprung flanges to assure that they won't tear paper. I have never met a long takeup spool that I didn't like. Now, let's get to

some of his objections with what I've already written. Matter of fact, all of them.

- > Nelson-Wiggen pianos used a wooden spool box, and they track well.
- > Is it the precision geometry of the spool box or the larger holes in
- > the roll that makes the Nelson-Wiggen not need a tracker mechanism?

First was my comment that spool frames are always made more heavy. That's true, including the Nelson-Wiggen. You can find a picture of one of several that I've rebuilt in the recent new book, Golden Age of Musical Instruments.

Wood side plates notwithstanding, its spool frame is also built much more substantially using hard wood, because it has to play large, 10-tune rolls on 3-1/2" cores with 5" dia flanges. So the hardware to drive, rewind, and support rolls is heavier and mounted more solidly, usually to mahogany or maple (as opposed to poplar wood). The flange mounts are bigger and wider. And the side plates are just as precision-made as steel or cast aluminum. Matter of fact they will last longer than metal frames because they don't pass their shafts through drilled holes in the side plates without bushings or bearings. Just because a spool frame was made of wood (of any kind, for that matter) like the spool box on regular players doesn't mean then that it could not be precision. It can be exactly right and it will stay that way.

- > Early Wurlitzer instruments used a wooden spool box with a small
- > five-tune roll wound on a wooden spool with wood spool ends (flanges).
- > They also have a small take-up spool with adjustable flanges on the
- > take-up spools. These instruments have small holes in the music roll.

Again, wooden spool frames are quite acceptable. Don thought that unless the spool frame is metal, my comments don't apply. They certainly do. One look at the rolls being transported by such a spool frame and one would see they must be heavier. I too have restored commercial instruments with wooden spool frames. I designed a spool frame 23 years ago, still being sold and a great success. To do that, one needs a bit of experience on what works, and why.

As far as wooden spools and wooden flanges go, these are the old style but quite acceptable, being far more precision and long-lasting than cardboard and plastic. So wood doesn't negate my comments. Everything I have said previously still applies and these examples are not even exceptions. No die-cast rules were ever given that metal had to be used for side plates. I have already mentioned the Wurlitzer roll changer, and the Hupfeld had a 6 and a 10 roll changer, as well as other companies. In the units I've seen, they used wooden roll flanges and wooden cores.

The material used isn't the point. It's how it's done. Robbie commented below Don Teach's letter, reminding Don that perhaps the way that the flanges are stuffed and glued into a rather thin, relatively flimsy cardboard core might have something to do with how they track. This was a mass-produced system to turn common player rolls out by the millions for as little as 50 cents apiece. I think perhaps we are gaining on the real problem.

For instance, the percentage of acid in the paper also has to do with how long the roll can last.

That isn't observable either in a new roll, but the manufacturers probably knew. For some reason, the cheapest rolls usually had the cheapest paper, too.

Don made the comment:

- > By the way, it was a common math error that gave them (the rolls)
- > their unusual hole spacing.
- > There were many cutting errors in the coin piano rolls
- > yet they track well, even Coinola rolls with their nine-to-the-inch
- > spacing.

This isn't true. The 9 to the inch is a printer's pica scale, and still used today. 6 to the inch is another subhead scale. It was the printing industry that first provided the technology and machinery to make player rolls. As far as the Wurlitzer scale is concerned, they used what was known as a "scale engine" to develop that scale end for end so that it would be very difficult to duplicate. A scale engine is a mechanical device that divides an increment by subtracting a fixed amount and then repeats the division across the scale, allowing for the width of type (or hole) to be included. It was done on purpose, in order to sell all the rolls for Wurlitzer and have a corner on that market. I think it was a good idea by Wurlitzer, myself. Certainly not an error by Wurlitzer.

Don also says:

- > Every coin piano I have ever seen has flanges on the take-up spool that
- > are adjustable.

Of course. An initial adjustment can be made according to the roll chuck position, or when the roll chuck is changed or substituted for another. The position of the fixed flange on the roll chuck can vary among spool frames. That really isn't why the takeup flanges were adjustable, however. The main reason they are "adjustable" is because the easiest and cheapest way to mount them and disassemble and repair them was by fastening them with set screws on the takeup shaft. I suppose that also makes them "adjustable."

- > These machines have no tracker and played the rolls
- > more times than any home player and were often used on many different
- > machines as the route operator would take the rolls from one location
- > to another. They tracked well and are usually found with the roll
- > edges intact. Was it the precision of the spool box that prevented
- > these rolls from tearing and tacking well? I know it wasn't the
- > quality of the paper, as it varied from poor to okay.

That was also my point, too. Answer: It was the precision of the spool frame transport, and not the quality of the paper that preserved the coin piano rolls. I said at the beginning that Don is a professional, and knows these things already. As far as the rolls being switched from piano to piano by the route man, that point is moot. If the transport is able to safely control the roll when

properly chucked up, then my point is made. It's more likely the old home player that would feather one side of its rolls, so that when another player tried to play them, they wouldn't last very long.

- > The Reproducto had a model that used small rolls much like a home
- > player piano with no tracker mechanism. I know of no original coin
- > pianos with bearings, other than the Mills machines which were the
- > most precision made of all the coin piano spool frames. There is
- > little play in them even after 90 years of use.

What have we just determined about the spool frames found in commercial machines? That they are heavier-made, they control paper better, there is no tracking mechanism and none was needed, and that they would undoubtedly be stronger and would last longer. Commercial rolls used in those machines, if they came with flanges, were also made heavier and were more precision. Frames that didn't use bearings didn't last as long, but with continual maintenance, would outlast a home player doing the same duty. One point that was not made is that the paper path in a commercial spool frame is usually more deeply convoluted than the path of a home player. This also stabilizes the paper travel, especially on reroll.

- > My question of the day is why not try to improve the geometry of an old
- > player that tears up the rolls? Were they all perfect the day they
- > left the factory?

Nothing is perfect. But why not ask yourself how many player pianos in a lifetime have you seen whose geometry is so crooked that you need to re-machine it? The lateral lost motion in the left roll chuck itself is far greater than the geometric error one will almost ever find in a spool box. It orbits as the roll goes around. And the vertical alignment of the ends of a tracker bar can be off a 16th of an inch and still track just fine. It is the deeply convoluted paper path of a spool frame that requires very close tolerances in regard to chuck and tracker bar alignment with the takeup spool, not a home spool box whose paper is making a shallow angle with the tracker bar. But then we agree, they were heavier and more precision.

Just for terminology's sake, I thought I might also add that in a home player piano, the transport is called the "spool box," and in the commercial machine, the transport is known as the "spool frame." The difference is often that the spool frame doesn't have to be integral with the stack or piano to be stable. It can be mounted anywhere or stood on a bench separately and tested without a mount, while the spool box more often requires the mounting board itself to stabilize and square it. If you want to make sure of your spool box alignment, re-tighten the screws mounting it to the board and check square.

Craig Brougher