

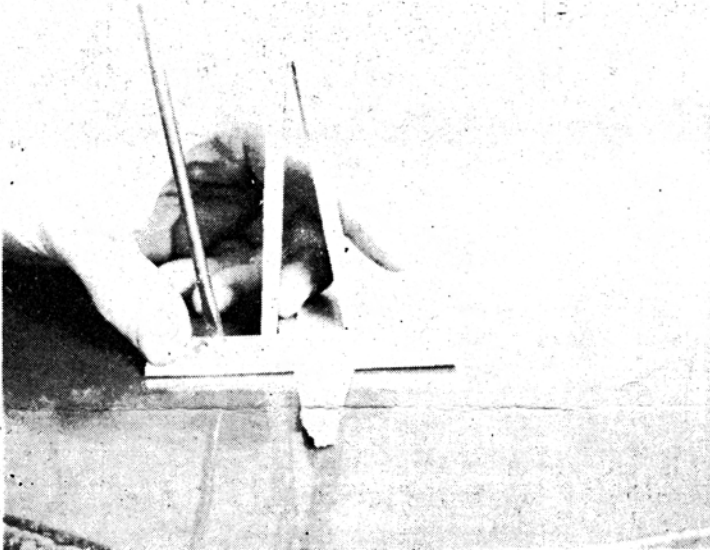
## INSTRUCTIONS FOR PNEUMATIC JIG

There are many methods for covering pneumatics. This simple pneumatic jig allows a great saving of time, because of its simplicity, over any system used. It is not awkward or any more inaccurate than the person using it. Great speed may eventually be picked up by professional users and it is possible to do the complete covering operation in one hour and fifteen minutes. Of course, the pneumatic sticks will first have to be sanded clean to the bare wood and rehinged if necessary.

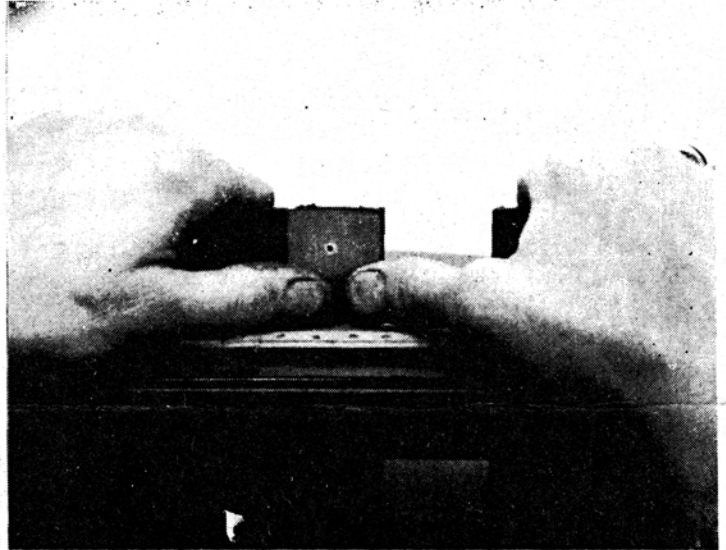
The average set of pneumatics consumes one and one third yards of pneumatic cloth. Use the best grade (available from Player Piano Co.) The average strip of pneumatic cloth will be about one and one half inches by one foot. The pneumatic jig is easily adjustable to handle any size. The other materials you will need are good sharp scissors, a disc sander, coarse grade flint sandpaper, boot patch cement, a small bottle of Elmer's glue. Ground rosin glue crystals are recommended for gluing the pneumatics back on the tier.

*Here are pictures and instructions to guide you step by step.*

1. Take measurement of span and set pneumatic jig.
2. Number of the pneumatics, unless they are all identical and you intend to sand both surfaces on replacing.
3. Remove pneumatics. Some pneumatics have a leather or cloth gasket glued underneath which makes it easy to remove. Others are glued wood to wood. Still, many actions may present no difficulty in breaking the glue without splitting the wood. Merely press with both thumbs and break it off. If it does not come off without breaking, then crack the joint at the hinge end with a wide chisel before doing this. This will break the glue joint from the opposite side up to the hole in the middle. Around the hole is where it is most likely to break. If all this fails, use a hot iron.

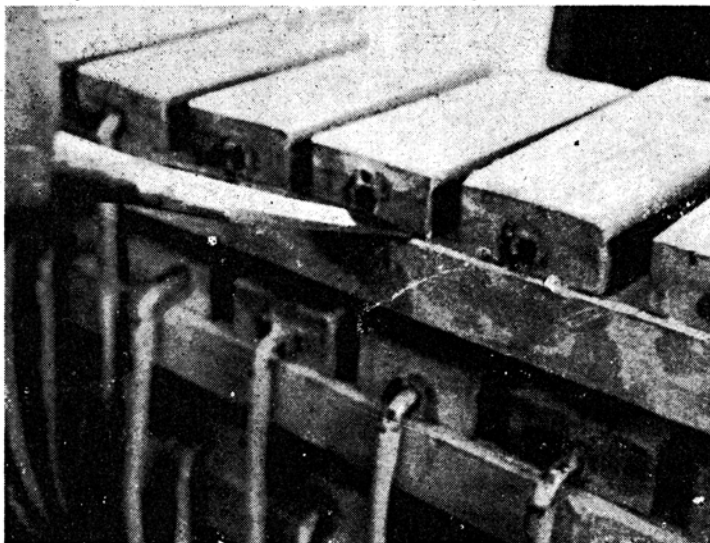


**SET SPAN**

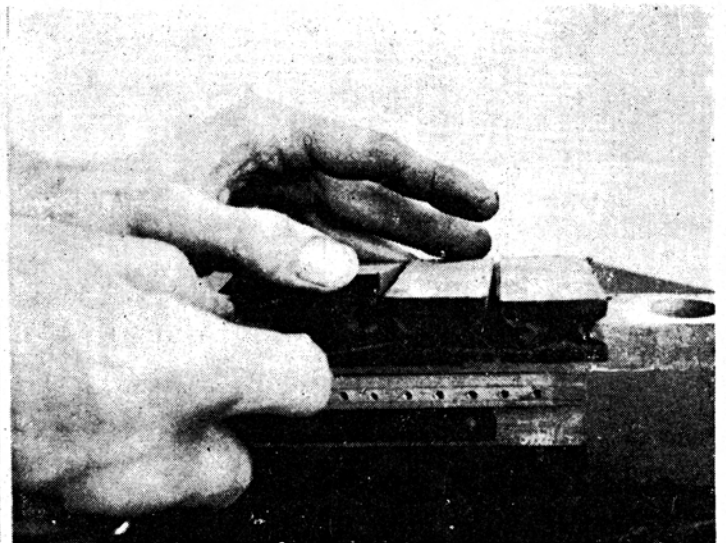


**PRESS WITH BOTH THUMBS**

4. Heating off pneumatics. Cut the old cloth from the front and lay back the pneumatic leaf. Peel off most of the old cloth from the glued part as it will eliminate part of the smell when heat is applied. Try not to use a good iron regularly used for ironing clothes. If an old one is not laying around, a good used one can be bought at a second hand store for a dollar. It is worth a dollar just not to have the job of cleaning it after the job.

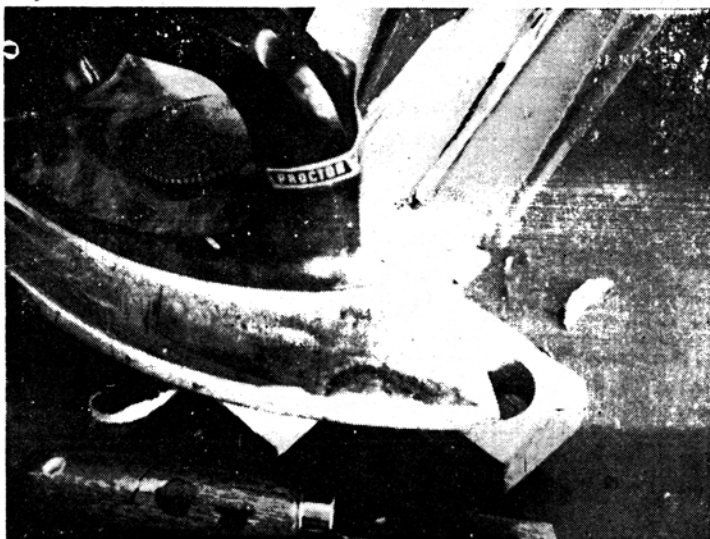


**CRACK HINGE END WITH CHISEL**

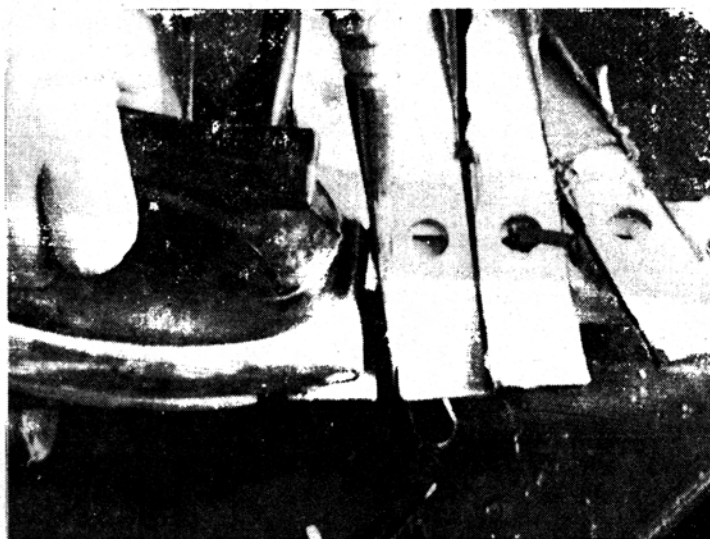


**SLASH OLD CLOTH FROM FRONT**

5. A slow penetrating heat is needed, rather than a high heat. Usually low temperature is right. It should take about one minute to penetrate to the glue depending on the thickness. About four at a time may be covered and so the iron may be moved along progressively taking one at a time, which will be about as fast and you can pry them loose once the iron is warmed up. It is better to pry sideways as the glue starts to melt. This will avoid warpage. Bending the wood while hot tends to form it the way.



**A SLOW PENETRATING HEAT**



**PRY SIDeways IF POSSIBLE**

6. As the wood is heated, the moisture in the wood activates the glue into sticky part-melted state briefly. If the heat is left for too long, you will have defeated your purpose by actually driving all the moisture out of the wood and bake it on harder than ever.

7. Sanding the pneumatic sticks. The edges must be sanded to remove all old cloth and glue. Don't bother to peel off any of the old cloth. It will use more sandpaper, as it will be clogged up quickly with the old rubber, however, the time saved by the extra sandpaper is well worth the money. Some of the original glue used to cover the pneumatics may have spilled over the inside edge and should be removed with a knife, file, or sanding, to prevent the sharp edge from cutting the new cloth.

8. Use a circular sanding wheel or disc sander. If you do not own a disc sander, a circular piece of plywood may be fitted to an old motor bolted to large pulley. Cover the disc with boot patch cement. (This may be purchased at any automotive supply store.) Cut the sandpaper with tin snips into corresponding circles and coat the back of the sandpaper with boot patch cement. After it has dried, the two surfaces will stick together as the sandpaper is pressed on over the disc. After sanding about a dozen pneumatics the sandpaper can be pulled off and another slapped on in its place without recoating the disc.

9. Sand four pneumatics at a time. This will prevent bearing down too hard on one corner and sanding them crooked. Sand a little and look, then sand some more until all the glue and rubber is off. Keep a tight grip on the four pneumatics all the while. There may be several widths. These can be sorted out beforehand or picked up to match as the sanding is done. However, be sure they are all the same size and mashed down straight. The hinge end is sanded alone.

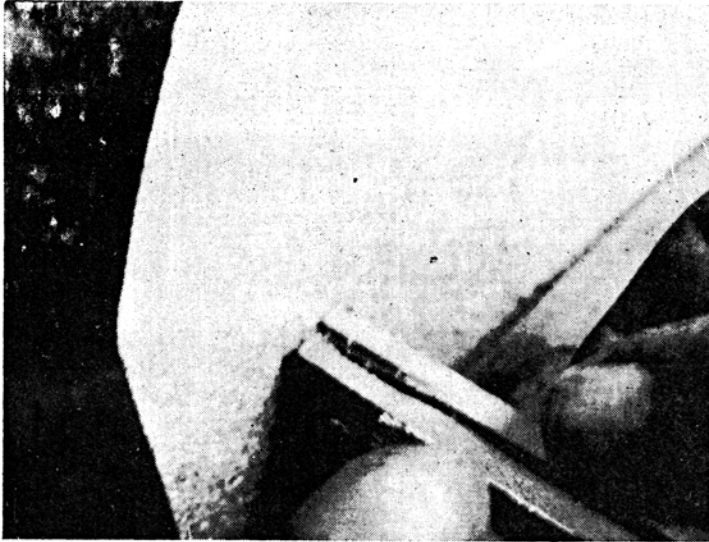


**SAND FEET FIRST**

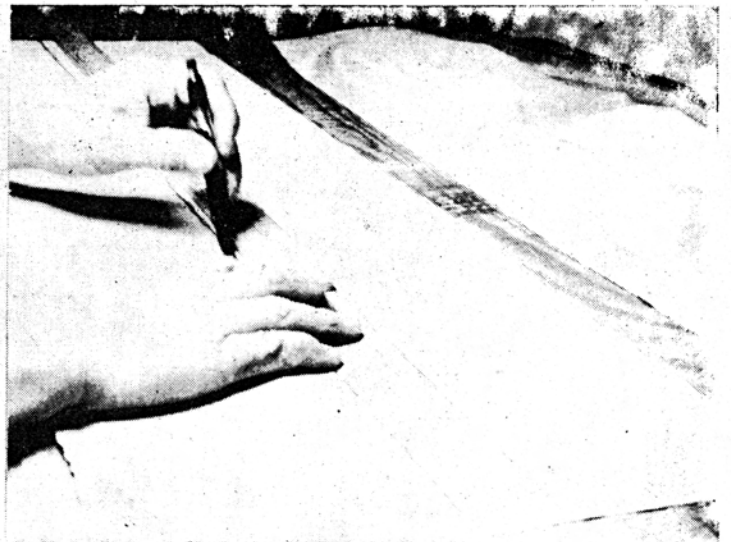


**KEEP A TIGHT GRIP**

10. Sanding the hinge end to save the hinge. The hinge end is sanded individually in two operations. By slipping the other out of the way or sanding at a slight angle, one edge at a time is sanded and misses the hinge cloth. The outer surfaces usually do not need to be sanded at this point. It is better to wait until the job is completed and after trimming.

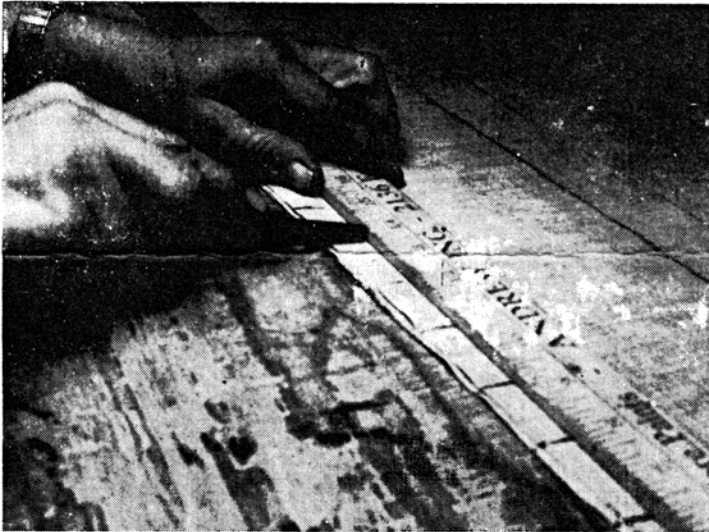


**SANDING HINGE END**

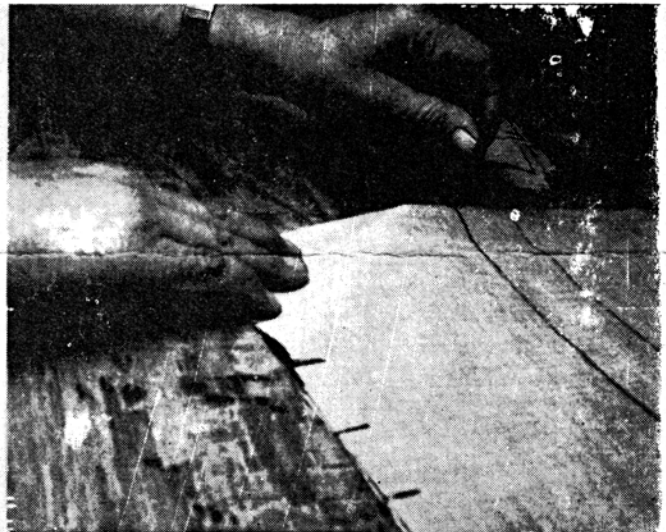


**MARK CENTER LINES**

11. *Cutting the pneumatic Cloth.* Measure around pneumatic and allow lap over on hinge end. Cut strip proper length by the yard width. Calculate width of the small strips needed and allow about  $\frac{1}{8}$ " trim to hang over on both sides. This will average about one and one half inches. Four large pieces of cloth should be enough figuring 22 or 23 pieces from each.

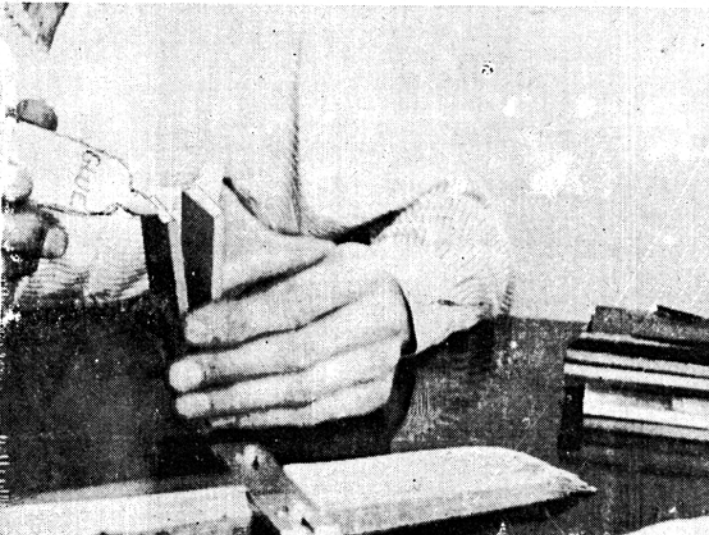


**STARTING CUT**

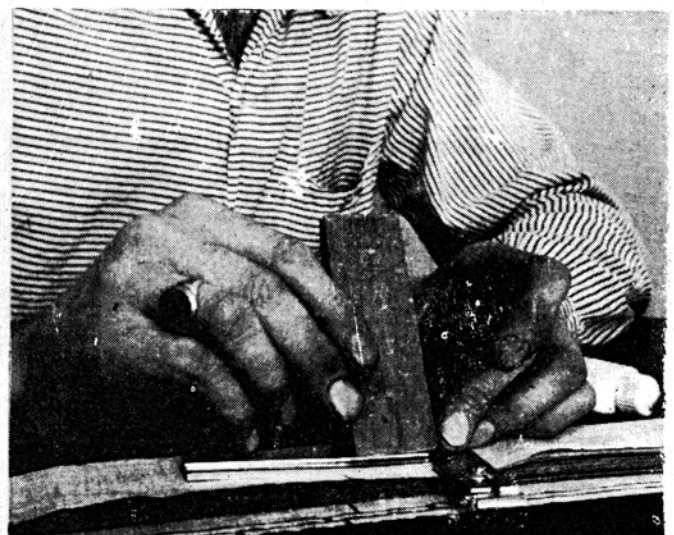


**TEAR FOUR AT A TIME**

12. Mark two center lines on the large strip of cloth. Lay them one on top of the other. Mark along the top piece at the edge of the cloth, the width of the strips, then make a starting cut with a knife. From this starting cut it may be torn four at a time. Collect them in a pile and jog them to the edge. Divide the pile in half. Lay the jig on top and you are ready to start. The purpose of working on the pile of torn strips is to give a cushion surface to work on.



**GLUING FEET**

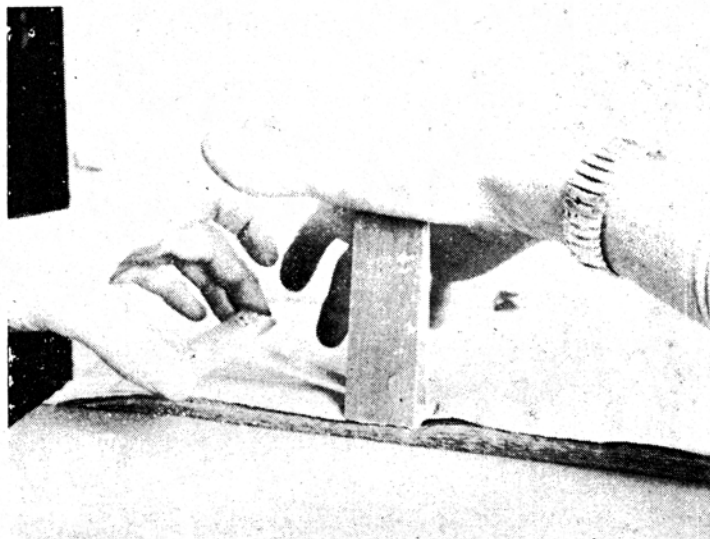


**SWING THE OTHER INTO POSITION**

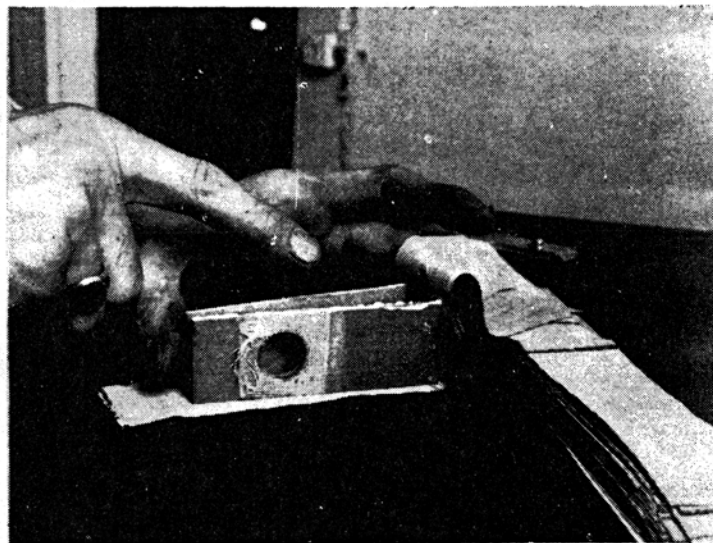
13. Now is when the center lines come in handy. They show you exactly where to position the jig each time. Use a small squeeze bottle of white resin glue (Elmer's Glue) and squeeze a dab on each of the pneumatic feet. Pat with your index finger to even it out. You might as well get used to glue being on your finger all through this whole operation, because this is the quickest and most exacting way.

14. Plant the feet down, putting one in place and then swinging the other into position as shown in the picture. With thumb pressed on top, the jig is easily slipped out from between.

15. Lay on side and throw back cloth over your other index finger (the one without the glue on it). Draw a string of glue. It is not necessary to go all the way. If you don't get enough the first time you can squeeze out more. The glue may be distributed over the edge surfaces by raking your finger across and patting it into the corner. Then bevel the inside edge of the glue with your finger at an angle. This glue will squeeze out when cloth is pressed down, so it is not desirable to have more than a bare minimum of glue close to the inside edge. It doesn't matter how much is squeezed out the other side; this is trimmed off with scissors.



**JIG SLIPS OUT**

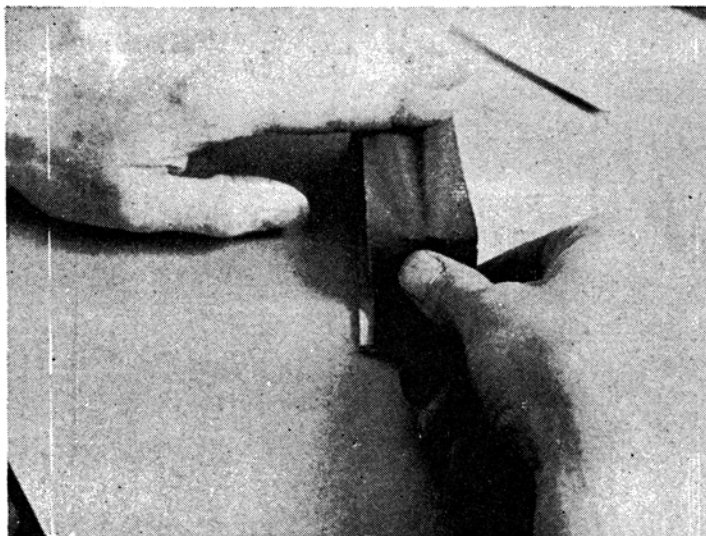


**LAY ON SIDE**

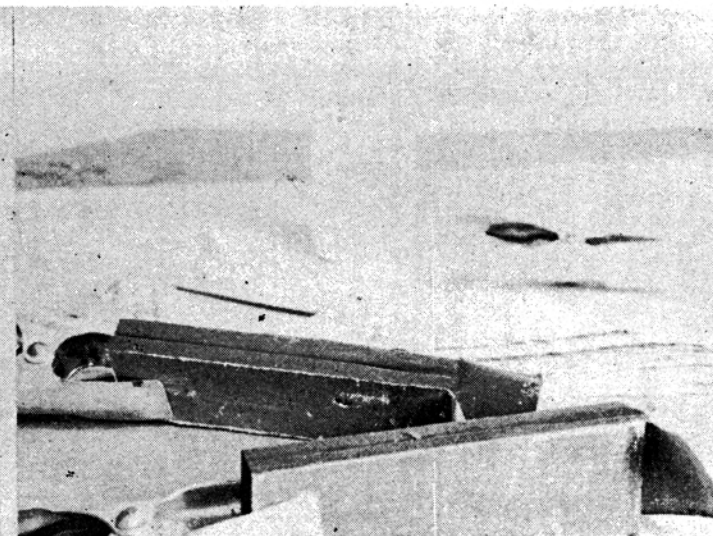
16. Move your hand forward and make several strokes to press the cloth down using the full length of all fingers. This way it will not be dished in the middle. All the while, keep the thumb of your other hand pulled down on the tail. Flip over and repeat the operation for gluing the other side.

17. At this point it is optional whether to go ahead with gluing the hinge end. Some prefer to take more time and make this a separate operation, allowing this much to dry, be trimmed, and clamp the pneumatic into a closed position. If so, lay the pneumatic aside at this point and begin trimming after a dozen have had the feet and sides glued. It is very essential to trim within ten to fifteen minutes or else the glue will become so hard as to handicap the trimming.

18. The reason for this separate operation, although it is not standard practice if speed is more important, is to allow the glue to be sufficiently dried to collapse and clamp the pneumatic in the closed position so that there is no danger of becoming hingebound. Hingebound simply means that too much glue gets in the very critical crack just beyond the hinge and gives resistance in collapsing. If a neat job is done, it will not be of great importance and you could continue on from step #16 without going to this extra trouble.

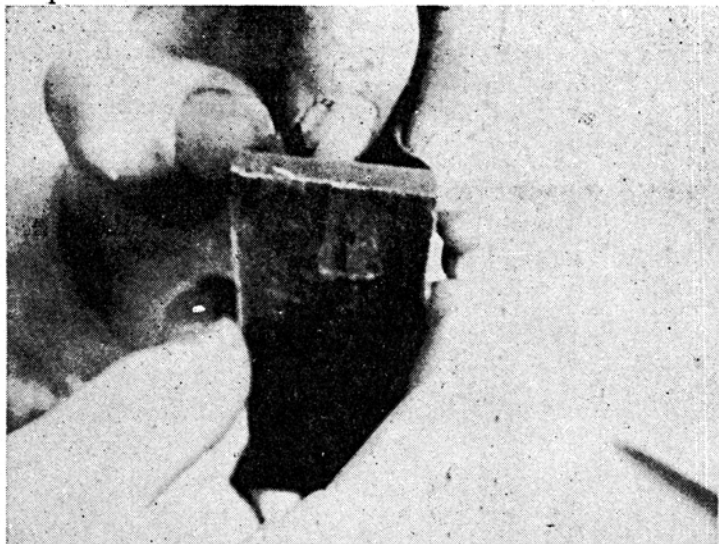


**KEEP PULLING DOWN ON TAIL**



**CLAMP PNEUMATICS**

The crease is formed by poking with index finger and following with thumb and middle finger at the same time collapsing the pneumatic.

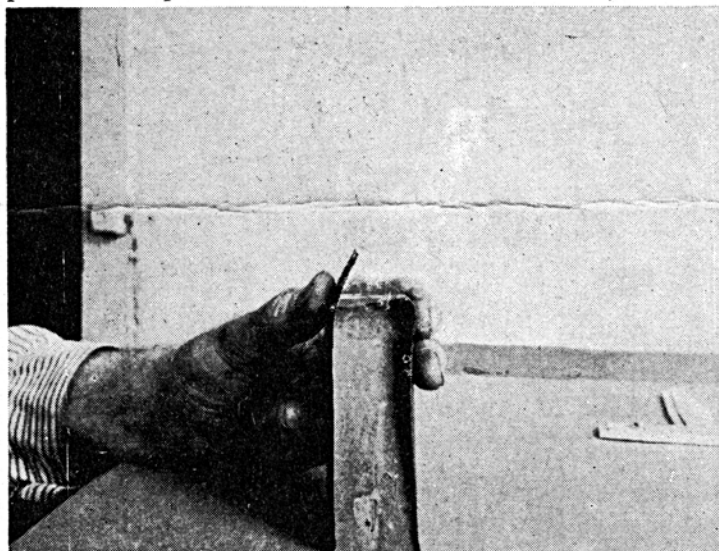


**MAKING THE CREASE**

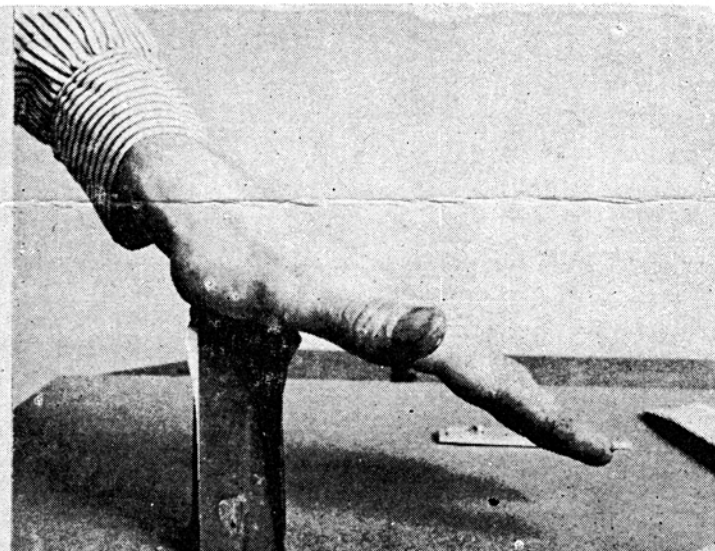


**CORNERS ARE IMPORTANT**

19. *Gluing the hinge end.* Usually there is almost enough glue left on your finger from doing the sides so only a spot of glue from the squeeze bottle might be needed for the final lap over. It is very important to reach into the corners with the glue and just as important not to get too much glue on. To make sure there aren't any loops on the corners due to slipping back, vise the pneumatic from end to end in the palms of both hands momentarily to make sure it is set, or just press down in its table position with palm of one hand after the tails have been lapped over.

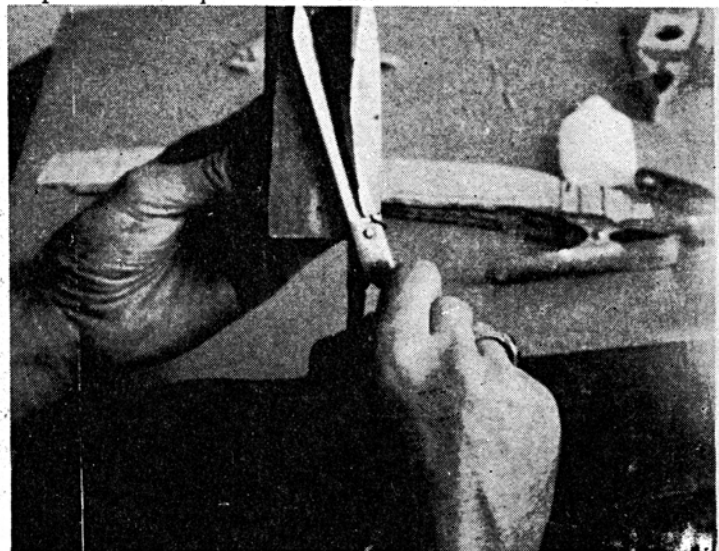


**THE FINAL LAP OVER**

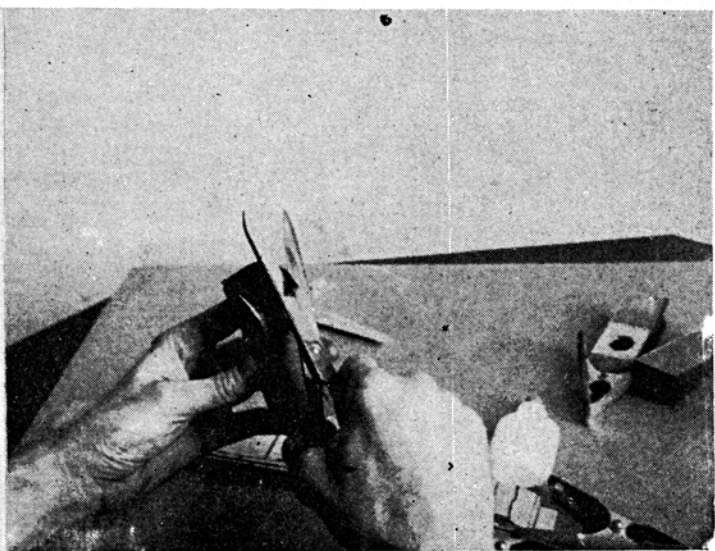


**PRESS DOWN**

20. *Trimming the pneumatic.* Use good sharp scissors which are large enough to handle easily. Lay one blade against the wood and put pressure crossways on the two blades to prevent the cloth from slipping through. When you come to the corners it helps to make a quick down cut.



**LAY BLADE AGAINST WOOD**



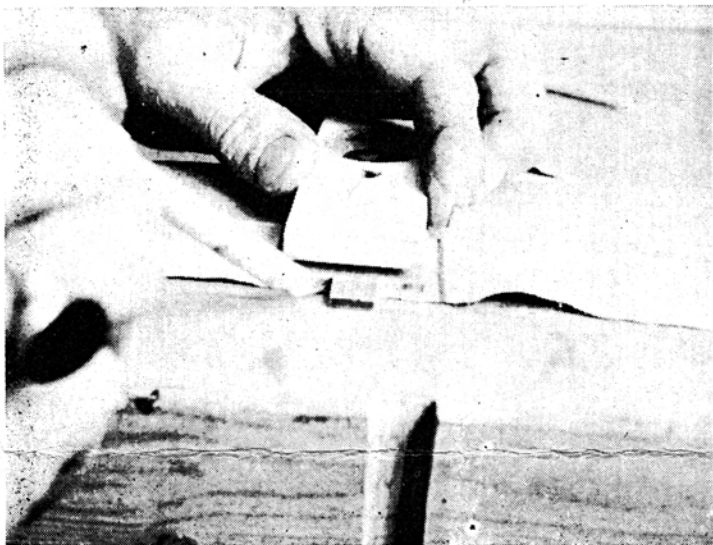
**DOWN CUT**

21. All that remains after trimming is to sand the surface to be glued. This is not always essential. It is best to sand both tier board and pneumatic face. By sanding tier board not completely through the old glue, enough of it remains to show lines of where it was originally glued. Hot animal glue is best for regluing. The reason for this is that the hot glue sets up quickly and has less shrinkage. Using it hot and thick, gluing only one or two places ahead and planting the pneumatic firmly down until the glue oozes out around the edges, it is quite apparent that there can be no leaks on the bottom surface. No clamps are needed. It will not spring up again if both surfaces are smooth and level. It will take less glue also. In less than one hour, the glue should be set firmly enough to begin reassembly of the action.

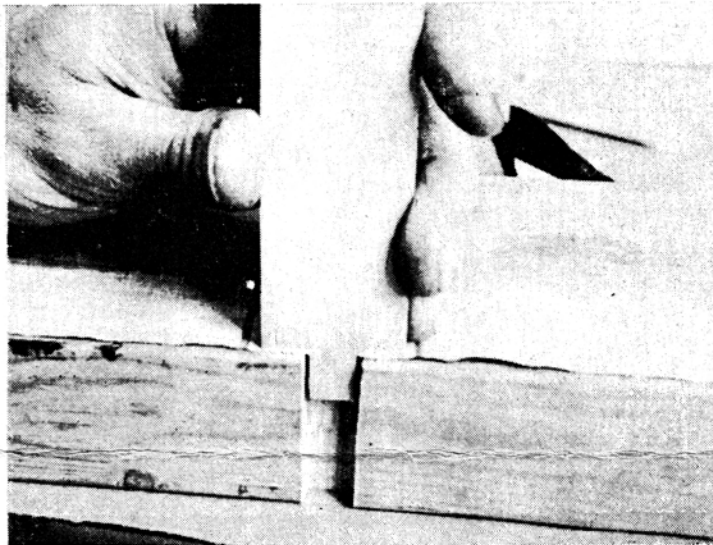
22. You do not need an electric hot glue pot to be able to use hot animal glue. A pan of water with a coffee can submerged containing the glue will suffice. The hot glue crystals may be just barely covered with cold water in a separate can and then set in a pan of boiling water to warm and dissolve. You will notice the glue will appear to swell up and look like you have not added enough water. Do not add more water. In a few minutes the glue will melt down and be just the right consistency. If it is too thick, then is the time to add more water.

*Warning.* Never use bone glue. This has the same appearance as hide glue but has little strength after it has hardened, and will powder away or allow the pneumatic to fall off within a year. Always use a good grade hide glue and it will stay glued for a lifetime. Use the best ground animal glue—available from Player Piano Co.

*What to do when you have a pneumatic with a built in finger.* Obviously you can't use all the method as described before without some modifications. So for the benefit of these cases here are special instructions.



**MAKE SHORT CUT**



**PNEUMATIC FINGER IN NOTCH**

1a. Use a sharp utility knife to cut the cloth and make two short cuts about a quarter of an inch back from the edge, using the pneumatic finger as a guide.

2a. Make a notch in a board the same width and lay pneumatic cloth strip in position.

3a. Glue the one side with the finger this way and set it down in the notch over the cloth.

4a. Pick it up and inspect it and press down the flap that goes over the finger and make sure it is well in position and plenty of glue to seal the flap and corners. Time should be spent to remove any excess glue from the inside edge at this point. Set aside to dry.

5a. Drill a hole in a board. Apply glue to the other straight foot. Place pneumatic finger in hole. Insert jig and press down, rocking from hinge end. You are now ready to pick up from instructions #15.

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**PNEUMATIC FINGER IN HOLE**