

RIB TAPE CUTTER

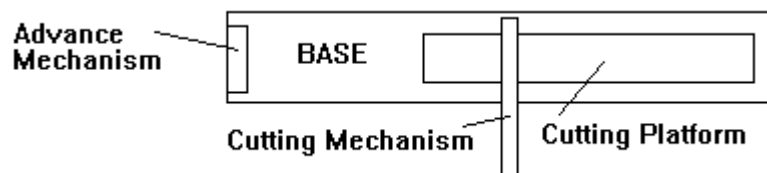
I have constructed a Rib Tape Cutter which may be of use to modellers wanting accurate scale Rib Tapes. Although the device takes some time to construct and probably requires access to a lathe, it simplifies the cutting of rib tapes as well as attaching them to a model.

The cutter basically comprises two 'V' shaped cutting 'heads' which descend down onto a moveable cutting 'platform'. The rib tape material (I use Solartex or Coverite) is stapled to the platform which is moved after each cut by an amount equal to the 'pitch' of the ribbed pattern (e.g.: 1mm for a 1/5th model of the Stearman PT17). The device can cut through over 10 layers of fabric which makes the process reasonably effective.

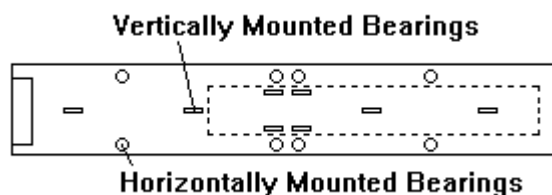
The sections which follow outline the major components of the cutter, but please realise that not every detail is spelt out and you may prefer to build yours using different techniques. As a general principle, most components should be built in a way which allow adjustment so that almost any tape width or pitch can be accommodated. Illustrations are not to scale.

1. Base

I chose a 20x220x1200mm wooden plank onto which the other components are mounted. This size allows a 600mm long cutting platform to move almost its entire length under a centrally mounted cutting mechanism.

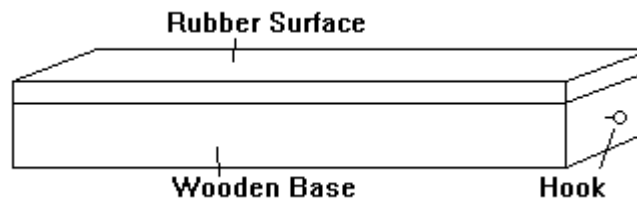


The cutting platform needs to be able to move small, precise amounts and withstand quite severe cutting loads. Bearings mounted onto the base provide this precision (I chose 22x7x7mm sealed bearings, but almost any reasonably priced ones will do). Eight are required to allow smooth movement over the full length of the base. Another eight prevent lateral movement, half of which (one side) may need to be spring-loaded if the sides of the cutting platform are not true. The platform should be able to move freely over the entire length of the Base, but without undue slop.



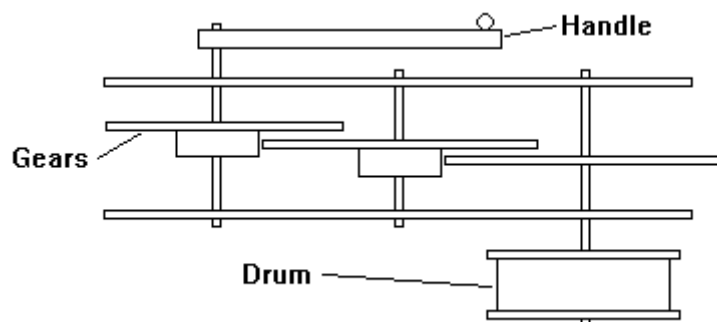
2. Cutting Platform

This is also made of wood approximately 20x70x600mm. A 3-5mm smooth rubber mat should be glued to the top to provide a durable cutting surface. Hooks are attached to each end (2), one for pulling the platform along and the other for a counter balance.



3. Advance Mechanism

A mechanism is needed to advance the cutting platform by small increments (e.g. 1mm) after each cut. I assembled a small gearbox which for each revolution of a handle rotates the circumference of a cylinder/drum by 1mm. Thin braided fishing wire is wound around the drum and hooked onto one end of the cutting platform. This 'advance mechanism' is attached to one end of the Base.

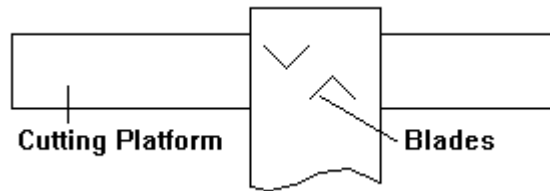


I obtained gears from a cheap toy and rearranged them between two aluminium plates to optimise ratios. The drum was turned from aluminium, the diameter of which obviously depends on your gear ratios and pitch requirements. The formula for the circumference of a circle is "Diameter x 22/7". Additional drums can be turned for different pitch sizes or the number of turns of the 'handle' varied.

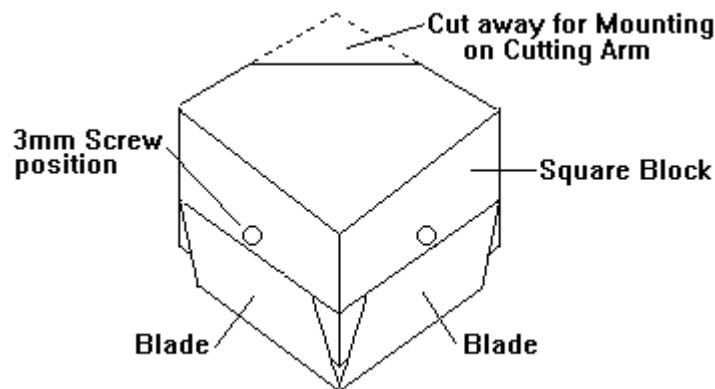
A counter weight is required to stop the cutting platform from drifting forwards on its own under cutting loads. A two ounce lead sinker proved adequate on my cutter. This is attached by thread to the opposite end of the platform and suspended over the edge of the table on which the base is clamped during use.

4. Cutting Heads

Two cutting heads should be constructed to allow each side of the 'tape' to be cut simultaneously. The gap between the heads obviously determines the width of the tape.



The heads can be made from aluminium or steel blocks (+/- 20mm square) and can be machined on a lathe. Each head needs two blades mounted at right angles to each other to form 'V' shaped cutters. I used three segments each of the +/- 10mm 'snap-off' blades. Shallow recesses can be filed into the blocks to help locate the blades.



The blades are epoxied to the blocks, and a right angled aluminium plate (or washers) bolted to the outside to keep them in place. It is important for the tips of the blades to meet exactly; the epoxy gives you time to position them accurately and prevent them from moving later under pressure.

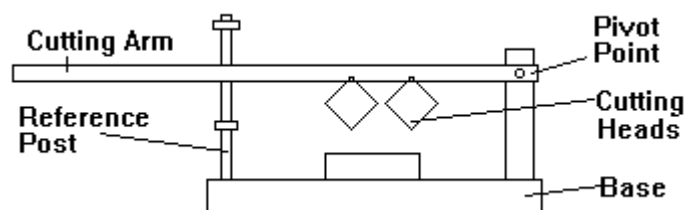
The sharp edges of the blades will point downwards once assembled, and as they cut easier when held at an angle relative to the cutting platform, a flat mounting surface will need to be filed onto the blocks and a 3mm thread tapped. Obviously, this must be done before the blades are attached permanently to the blocks.

A third cutting head can prove useful for making small irregular sized pieces of 'tape' by hand, especially if mounted on a handle.

5. Cutting Mechanism

The two cutting heads are bolted to an arm which is mounted on the Base and hinged across the cutting platform. The height of the arm should be adjustable so that it can be positioned more accurately later (to make sure both cutting heads cut the fabric properly). The arm can be spring loaded so that it lifts on its own when pressure is released after each cut.

A 'steady' or reference post is required to prevent the arm from moving from side to side while in use. If made out of 6mm threaded rod, nuts can be positioned at 'high' and 'low' positions. These then act as 'stops' which are very valuable when you find you have to do about 500 cuts for every length on the cutting platform!



6. Operation

It is quite practical to attach over 10 layers of heat shrink fabric to the cutting platform. A staple gun makes this an easy task. I usually cut strips of fabric 40-50mm wide for each rib tape of about 10mm.

The Base needs to be clamped to a table while in use. The Cutting Arm is operated manually, as is the Advance Mechanism after each cut. I found that the height of the arm and depth to which one cuts (hence the 'reference post' above) to be critical when cutting over 10 layers of fabric. Be prepared to experiment a little.

If fabric like Solartex is used, attachment to the model is obviously very easy; you simply iron it on. However, be prepared for the tape to shrink slightly as it is applied, and also for all the edges to appear frayed after the first coat of paint. This is easily sanded away between coats and may not be a problem if some form of paper is used instead of Solartex.