MASTER WEAVER

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SHORTCUTS

SECTIONAL WARPING

Much as we should like it, we can not give here a detailed description of this method. After all what we are concerned with here are Shortcuts, and nothing else. Those of our readers who would like to have the whole story may look it up in The Encyclopaedia of Hand-Weaving, or in the Modern Weaver No.3 Vol.4 *).

There are three factors which make the sectional warping a headache. First, the necessity of having large numbers of small bobbins of the same size. Second, the difficulty of keeping the same tension of all warp ends in the same section. Third, the difficulty of getting a high enough tension of the warp, so that it would not slip later on. We shall take up these problems in the above order.

1. The only case when we really need sectional warps is when the length of warp is more than 30 yds. With shorter warps a warping mill is superior in all respects. But with really long warps we can usually dispense with rewinding the yarn on bobbins, simply by buying it wound on ¼ lb tubes, or soemtimes on ½ lb tubes.

For instance if the warp is 50 yds long, and 36" wide we shall use 18 sections, and each bobbin should have 50 times 18 or 900 yds of yarn. Although we can wind these bobbins at home if we have plenty of time, and a yarn counter, it is much easier and cheaper in the long run to use ready made tubes.

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*) This issue is still available. It has five pages on sectional warping. Please send 75¢.

In the above example 900 yds is just a little less than ¼ lb of 10/2 cotton, or of 25/2 linen, or of 14 single linen, or 16/2 wool, and also less than ½ lb of 5/2 cotton, or 12/2 linen, or 8/2 wool. In each case we must buy as many tubes of yarn as warp ends in each section. What remains on each tube can be used for weft or for a shorter warp made on a warping frame or a warping mill. The tubes after being used should be marked with a number indicating the length of yarn remaining on the tube. For instance if we had a ½ lb tube of 6/2 cotton (1260 yds) and used only 900 yds, then what remains is 360 yds We may find this information invaluable later on when we make a similar sectional warp either shorter or narrower.

When warping directly from tubes we should use a bobbin rack on which the tubes will unwind from one end. Care must be taken that all tubes unwind in the same direction. Tubes must be held in vertical or nearly vertical position.

The following remark applies to all sorts of warping. When tubes or bobbins are placed on horizontal shafts in a standard rack, they rotate when unwinding. This turning often produces vibrations particularly when the warping is fast, and the vibrations change the tension of yarn. Therefore whenever we can, we avoid standard bobbin racks, or go slow. This danger does not exist when the yarn is unwound from one end of a tube.

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2. Most tension boxes have one fault: they give a uniform average tension of each section, but they can not prevent a difference in tension between warp ends in the same section. If one end will get tighter than the rest, it will slip on the rollers, and may cut deep into the already beamed warp. Since no two tubes of yarn will unwind with exactly the same resistance, the warp is hardly ever completely uniform.

Yet this problem can be solved very easily. Each roller should be taken out of the tension box and coated with a soft, but rather rough and strong fabric (soft felt, heavy flannel etc). A strip as wide as the roller is cut from the fabric, the roller generously painted with glue, and then wrapped in the fabric. The surplus of the fabric is cut off, and the roller returned to the

tension box. Now the warp ends can not slip on the rollers because of the friction offered by the soft fabric.

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3. When the tension of the warp is uniform but not high enough (that is the warp is comparatively loose on the warp beam) we cannot avoid slipping of the warp during weaving. What happens is that one layer of the warp slips on top of the next one until the warp is so tight that it can not slip any more. Keeping the warp slack during weaving will not help, because it will slip anyhow during beating.

With many yarns this does not matter. An elastic, strong, and smooth yarn will tighten uniformly, and we shall hardly notice it. But fine, sticky, or not elastic warp will be ruined because one layer will tangle with the next, some warp ends will get caught in the layer where they do not belong, and they will stretch or even break.

In plain beaming we can always separate layers of warp with paper. But this method becomes extremely difficult in sectional warping, where we must use strips of paper exactly 2" wide and as long as the warp.

The only way is to get the right tension during beaming. A good tension box should be made in such a way that the tension be adjustable in large limits. If it is not, use two tension boxes one after another (the additional box can be mounted on the breast piece of the loom). All sorts of substitutes can be used as well if the yarn is not damaged by friction. For instance a pair of lease-rods (single cross) can be mounted in front of the loom, and if this is not enough then two pairs. The warp as it comes from the rack can be wound in a piece of chamois leather tied tightly to the breast piece. Several dowels (broom sticks) can be placed alternately over and under the warp, and then tied together in a bunch to the breast piece. One thing here is important: that whatever contraption to increase the tension we are using it must not be re-tied or readjusted when changing from one section of the warp to the next. Therefore a helper who would hold the warp tight when beaming is worse than useless because he could not possible keep the same tension all through the operation.

THE WARPING MILL

The modern Warping Mill is in itself a shortcut, and when it is properly constructed there is little to be said about it. Please read the description in the Master Weaver No.8 and 9.

The warping is quite fast when made with <u>two</u> tubes of yarn. For large warps one should use a much higher number of tubes. There is no advantage in warping with 4 or 5 tubes because what we gain in warping, we lose in making the single crosses at one end of the warp. Thus we should use either two or ten tubes. A higher number up to 18 is possible but not very practical.

The question is whether keeping all crosses single at one end of the warp is worth while. In our opinion it is not.

Thus perhaps the best method would be to keep to double crosses all the time. For small warps use just two tubes and dispense with the heddles of the heck-block. For large warps use 10 tubes and cross them in pairs. Thus tubes 1 and 2 go through the same heddle of the heck-block; 3 and 4 through the opposite heddle; 5 and 6 through the next and so on. When making the first cross (for spreading) we shall have 10 x 10 ends, and in each cross for threading: 2 x 2 ends.

Warping from 10 tubes is extremely fast, because one portee has 20 warp ends, and a warp of 1000 ends is made in 50 portees.

In exceptional cases we may use any number of tubes from one to 20. But if we want to have uniform crossing we must use an odd number of heddles in the heck-block: 3,5,7,9 etc.

When working with a counter we must remember that the counter turns only one way. Thus if we made a mistake - coming back does not substract from the number shown by the counter. Just the contrary it shows another portee. It the mistake was in portee No.5, when correcting it we come back to portee No.4 - but the counter will show portee No.6 instead. Thus every mistake which requires coming back to the first cross <u>counts double</u>.

The warping with a large number of tubes requires some attention being paid to the broken warp ends. Since the operator does not need to watch the warping mill, except for the counter, he should concentrate on the rack, and unwinding of the tubes.

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