

BI-MONTHLY BULLETIN
FOR HANDWEAVERS

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Z-HANDICRAFTS FULFORD, QUE., CANADA



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MASTER WEAVER

BI-MONTHLY BULLETIN FOR HANDWEAVERS

Z-HANDICRAFTS - FULFORD - P.Q. - CANADA

July, 1957

No.3 L

DESIGNING MALE EASIER

TEXTURE.

In this article we shall use the word "texture" in its proper meaning, and not in the somenow corrupted interpretation used in the "3D" weaving. As we have explained this elsewhere (MW $4/\pm$) "texture" in modern weaving denotes too ofter only a rough, but otherwise uniform surface, when in the strict sense of this word here is as much texture in a pane of glass or a sheet of aluminum foil as in beans spread on a table top, or in corrugated iron.

It is a purely academic question, as to when a texture becomes a pattern. A small 3D pattern repeated over and over again may be called a texture, and a very rhythmical texture as the already cited corrugated iron may be called a pattern.

But the problem is more involved than this. We often call "texture effect" a perfectly smooth and uniform surface which appears to have rough texture, but really has none. We could say then that such a surface has two textures: one real, and another visual; one smooth, another rough. We have a very good example of the above case in Crepe Weave (MW 20/9). There are real Crepe fabrics, and fabrics with crepe effect only. The first can be recognised by touch, the second by sight.

In handweaving we have the following cases where the problem of texture is involved:

- 1. A fabric with uniform texture, whether rough or smooth. Most weaves can give smooth texture and Satins (MW 31/1) excell in this direction. The rough texture may be either rhythmical (Waffle, Corded fabrics, Halkrus, etc.) or chaotic (see Third Dimension", MW 17/4, and "Accidental Weaves", MW 26/1).
- 2. A smooth fabric which appears as having heavy texture. The best example are small colour patterns in tabby, basket, or twill. See: "Colours in Simple Weaves" (MW 5/9).
- 3. A variety of textures in the same fabric, but without any definite pattern. For instance if we make a compound warp: one inch of 3D yarn, and one inch of smooth yarn, and then alternate the same yarns in weft in the same way we shall have three different

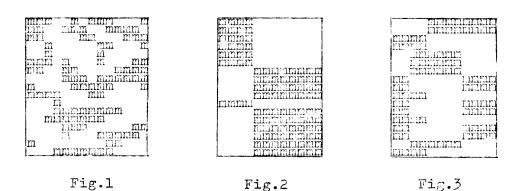
tentures: rough, half smooth, and smooth. Compare "Multiple Warps" - MT 26/6.

4. Variety of texture which forms a certain pattern. And this is the subject of our present discussion.

Before we go any further we must applicate for not having enough space to go a little deeper into the theory of textures. But the reader will find a chapter on texture in practically any book about modern designing.

Our real concern now is how to get two or more textures in the same piece of weaving so that: l-st - at least some of the blocke of texture would not go all the way across the woven piece in either direction; 2 - by changing the texture we shall not affect adversely the properties of the fabric; 3 - we would not need to resort to pick up, draw-looms and other involved teanniques.

In general this problem is about the same as of gettting one pure colour anywhere in the fabric without it showing in the adjoining areas. As we know this is quite a problem, and can be solved either partially or in a very limited number of ways. The technique depends very much on the nature of the pattern. For instance if the



pattern is completely free as in fig.1, then about the only weave which can produce it is Corduroy (MW 14/3, 15/4). The dark parts will have cut pile, when the ground will remain uncat. It could be also done in double weave on 56 frames, and in Summer-&-Winter on 16 frames (only) but also on 30 treadles.

Let us then turn to a simpler case as in fig.2. We want rough texture in the shaded areas, and smooth texture in the light areas.

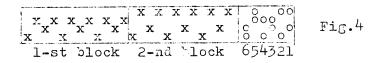
The simplest way to do that is to use a 3D yarn, and a plain binder. The pattern yarn can be chemille, boucle, or even homerpun wool. The binder and warp of about the same, smooth, and finer yarn.

Now, what sort of weave are we going to use? It could be overshot, summer-&-winter, crackle, or Bronson. We must think now in terms of floats, their length, and distribution. The longer the floats the better they show the yarn used, but very long floats are

not practical. Thus we must compromise. If very short floats are permissible, then summer-fi-winter is the best weave. For longer floats both Bronson (or Barkey Jorn' and Overshot are equally good since both can give us floats of practically any length, but overshot is easier to weave.

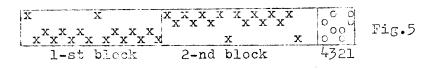
To decide what length of floats we want, we must make a small sample. We can take a sample frame or any small or large locm with a warp already on. Make a shot of tabby, and then pick up a shot of texture weft so that it will go over three and under one and so on for a couple of inches. Repeat this until we have about one inch, so that the sample is 1" x 2". Then let us make several shots of tabby and make another sample this time with the texture weft going over 5 and under 1. And again a third sample with floats of 7, etc.

We shall soon have an idea as to which of these samples looks best. If by any chance it is the first one, then we use summer-&-winter, and the draft will be as in fig.4:



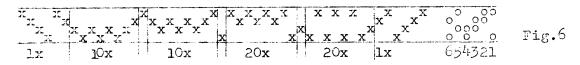
The treadling as usual for summer-&-winter with texture weft on treadles 1,2,3,4 and binder on 5 and 6.

But if the floats must be longer, for instance 7, then we must use overshot and the draft will be:



The treadling is 1314 for one block, and 2324 for the other. Texture weft on treadles 1, and 2; binder on 3, and 4. In this second case all floats will lie one under another in vertical columns. This may be an unexpected and not quite welcome addition to our design. Unfortunately we cannot get rid of it unless we go into a higher number of frames.

Now let us turn our attention to the pattern in fig.3. It has four blocks, and therefore it could be woven on a 4 frame loom only in crackle (for short floats) or in evershot (for longer floats). The draft for overshot is shown in fig.6.



The treadling: 1-st block - 435436; 2-nd bl. - 325326; 3-rd bl. - 215216; 4-th bl. - 145146. Texture weft on 1,2,3,4, and binder on 5, and 6.

The above examples should give us an idea as to how select a weave for any simple pattern in case of two textures. When more than two textures are desired we proceed exactly as in case of more than two colours ("Mcdern Overshot" MW 18/1). But since different textures mean also different counts of yarn, we must be rather careful. With heavy yarns the shots of weft may be spaced too far apart to produce a uniform surface. Therefore each new project in texture should be first worked out on small samples.

So far we discussed only texture effects in weft. This is because in pattern weaving it is much easier to centrol the fabric in weft than in warp. For instance if we notice that a particular yearn is not suitable we can easily change it if it is weft, but not if it is warp. But once the pattern is established nothing prevents us from "turning" the draft i.e. using a mixed warp and plain weft.

The story is entirely different if we produce texture effects both in warp and weft. We shall tackle this new problem in the nearest future.

SYNTHEFIC YARMS.

With the ever increasing variety of weaving yarns it is often difficult to distinguish between the natural and the artificial fibers. To make our task easier we shall divide all fibers into four groups:

- l. Natural fibers. The term is self-explanatory. These fibers are spun in their natural state, although they may be bleached or dyed or both. Bleaching and dying does not or rather should not affect the original properties of the material.
- 2. Processed fibers. They are also natural fibers but treated chemically in such a way that their physical properties are changed. As examples may serve: mercerized cotton, and weighted silk.
- 3. Artificial (synthetic) fibers. In this case the fibers are made from raw materials which in their natural state could not be used as fibers at all.
- 4. Mixed yarns. Here we have a group of yarns which are spun from both natural and synthetic fibers, such as wool and nylon for instance.

We have already described natural fibers with the exception of wool, which you will find in the next issue. We have also discussed processed yarns. Now we are taking up the next group - synthetic fibers and yarns.

Let us start with general considerations. First of all, why synthetic yarns at all? What is the purpose of creating completely

new fibers when there are so many natural ones? The obvious answer should be that artificial yarns are in some respect better. For instance that they are stronger, warmer, softer, more resistant to wear, heat, humidity, decomposition etc.

Although it may be true, as far as one particular property of one particular yarn is concerned, in general the synthetic yarns are not superior to the natural ones. Far from it.

But they all have one advantage in common: they are easier, and cheaper to make in large quantities. With the cost of manual labour becoming higher and higher, the natural fibers are getting also more and more expensive. Not all operations which the fibers must undergo before spinning can be mechanised. Although enormous progress has been made in case of cotton without any apparent damage to the quality, this was not so easy with flax, still more difficult with wool, and least satisfactory with silk. The latter requires the largest amount of manual labour, and this is the reason why the first artificial yarn (rayon) was made to imitate silk.

The problem of natural yarns in mass production does not end with the cost of labour involved. There is also climat, soil, transportation, and a lot of other factors. For instance cotton will not grow in northern latitudes, flax requires rich soils, good wool can be produced only when the average temperatures and the amount of rainfall are just right, and silk depends on the presence of mulberry trees.

None of these problems exist in case of artificial fibers. One can make synthetic yarns practically anywhere.

But then why should handweavers be interested in synthetic fibers? The reason is not economical, since in handweaving the cost of yarn is of secondary importance. But human nature being what it is, we are tempted to try any new yarn which appears on the market. On the other hand it helps when we can realise in advance what to expect, and this is why we write this article.

RAYON - Contrary to the popular belief "rayon" is not a name of a definite fiber, but of a whole class of fibers, made from a variety of materials. There are rayons made of cellulose (wood, or cotton rejects), or of protein (peanuts, corn, soya beans, milk, seaweed). Different rayons have different properties, but unfortunately when buying rayon yarn we seldom can get enough information as to its composition.

The best known rayons are: acetate, viscose, cuprammonium, ardil, vicara, lanital, fibrolane, aralac, alginate. The first three behave more like cotton, the other yarns are supposed to ressemble wool. But they are much weaker and less resistant in all respects. Some have rather unpleasant properties being for instance highly inflammable; some dissolve in acetone, acetic acid and even alcohol. They melt in a very low temperature. Their only merit besides being cheap is that they often possess a very high sheen, so high in fact that it must be moderated by artificial means.

MILON. This as many other synthetic fibers is made of phenol, which in practice means coal tar. Its main drawback is that it gets soft and sticky at a very low temperature, and therefore cannot be ironed. It darkens in the sunlight. Otherwise it is strong, elastic, easy to dry, resistant to friction, decay, etc. In handweaving behaves poorly: too strong when stretched along a straight line, too weak when bent (as in a knot). Unpleasant in touch, but this may be a personal factor.

VINYON. Made of a resin. Weaker than nylon. Less resistant to chemical solvents. Softens already in 165°F. It also shrinks much below boiling point of water by 12% (one inch in eight!).

SARAN. Similar to Vinyon. Still weaker, but a little more resistant to heat.

ORLON. Similar to nylon, but weaker. More resistant to sunlight. Can be spun to produce an imitation of wool.

TERYLENE. Made of petroleum, salt, and coal. As strong as Nylon. Resistant to sunlight, and more resistant to heat.

PERLON. Similar to Terylene, and nearly as strong. But it melts at $345^{\circ}F$.

POLYTHEME. About the lightest of all fibers, and also more resistant to heat than most of them, but much weaker than nylon.

GLASS. It could be a good fiber since it resists nearly anything: high temperature, abrasion, chemical action of any kind, age, etc. But it is brittle and not elastic.

We realise that this is a very sketchy description of synthetic fibers, but a complete survey would take more space than we can afford. Those, who are interested will find more information in books about industrial weaving, provided that they are of a very recent publication.

VELVET RUGS.

When we say "velvet" we usually mean a fabric and not a weave. And we are not going to speak here about the traditional velvet fabric. Although it certainly can be hand woven, and for that matter it has been done so for centuries, it is an extremely laborious process. Even an expert who weaves nothing but velvet can produce not more than a yard a day.

But if we so to speak enlarge the fabric by using heavy wool instead of fine silk for the pile and proportionately heavier warp and binder, we shall have a fabric identical with velvetin all respects except that it will have a consistency of a light rug.

Since the weave remained the same, we call it still Velvet weave, but of course not velvet fabric. Another name for it is warppile weave.

On a four frame loom we can whave rugs either in one solid colour, or with stripes parallel to the warp, or finally with a two-block pattern.

However we need additional equipment besides the standard one. First of all we must have one or two additional warp beams. One beam for solid colour or stripes, and two for a two-block pattern. Then we must also have velvet rods, or flossa rods of different sizes. About 5 rods of each size. We shall describe later how to make both.

But let us start first with the principle of the weave. As the name indicates, the pile of the rug comes from the warp. The pile is rising from a ground which in our case will be tabby, and which requires also a warp and a weft or binder. Fig.l shows all three in cross-section.

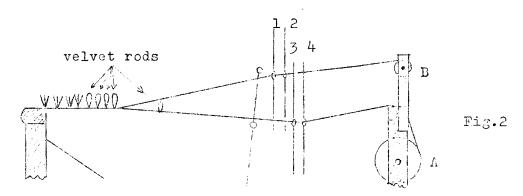
uncut loop // warp pile velvet rod // warp pile binder Fig.1

Fig.2 shows the process of making velvet. The ground is on the standard warp beam (A) and is threaded on frames 3 and 4. The pile warp is mounted on the additional warp beam (or beams) (B), and is threaded through frames 1 and 2. The ground is woven in the usual way. When we make a row of pile, the ground frames (3 and 4) are lowered, and the pile frames (1 and 2) are raised. In the shed thus formed we insert one of the velvet rods. Now: the ground warp is quite tight, while the pile warp is very loose. Therefore when we change the shed, the rod will remain entirely above the level of the ground warp, and the pile warp will go around the rod. We leave the rod there, and weave tha ground for awhile (usually 3 to 5 shots), then repeat the operation, insert a second rod, weave the ground, insert a third rod, and so on until all rods are used up. Then we take a razor blade and cut the pile on the first rod, which has a groove in its upper edge. This releases the rod, and we use it in the next pile shed. We never cut more than one row of pile at a time, except at the end of the project.

Once started, we keep the following rythm of weaving: cut the pile on the lowest rod, open the pile shed, insert the rod, weave a few shots of the ground.

It is rather important to understand this process before going any further.

It should be obvious now that we can control both the length of the pile and its thickness. The length of pile is equal to the

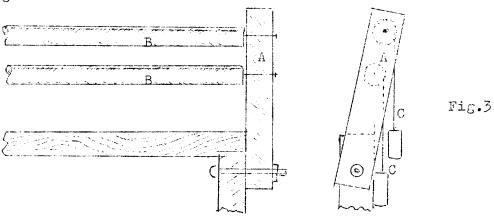


width of the velvet rods, therefore for each length of pile we must have a different set of rods. The thickness of the pile depends on how close we set the pile warp, and how much ground we weave between two sheds of pile. The less ground the thicker the pile, but also the weaker it is.

In general one cannot expect to get a very heavy rug by following this method, but the weaving is quite fast when compared with other pile techniques.

We can describe now the whole set up a little closer.

Equipment. The additional warp beams are the greatest problem, but fortunately one which can be solved at home if one has a few simple tools. The pile warp has hardly any tension therefore there is no need to make elaborate brakes, releases etc. The contraption shown in fig.3 will be quite satisfactory. Two flat pieces of wood (A) about 1" x 2" x 12" are bolted to the sides of the loom frame. Each of them has two holes to support the beams. The latter (B) are simply broom sticks or dowels 1" in diameter, and of such length as to fit exactly between the two supports. A nail driven in the center of each end of the dowels and passing through one of the holes in the supports will act as a shaft on which the beam will turn. As a brake we can use a piece of string (C) tied to the loom frame and wound around the beam with a weight hanging at the other end of the string.



The warp can be tied directly to the beams. A few tacks may be driven in the beams to prevent slipping of the warp. This is the whole thing.

The velvet rods are hard to find and rather expensive. We can make them from the steel tape used for crating. This tape can be had in several widths. To make a rod we take two lengths of tape (equal to the whath of the loom) and have them spot welded along one edge as in fig.4. This welded edge will later on point always downwards. When cutting the pile we insert the razor's blade between the two tapes.

Fig.4

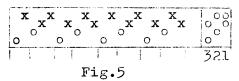
As our first project we shall make a rug in one colour. The pile will be made in wool No.3/2 or 4/2 (roughly between 850 and 1150 yards per pound). For the ground we shall use cotton No.10/2, and for the

binder linen No.12 to No.16 (or 25/2). The exact count of yarn does not matter in our case. Let us make the pile ½ "long, which means velvet rods made of ½" tape.

If we space the rows of pile about 1/6 of an inch apart, we shall need 6 inches of pile for one inch of ground. This means that our pile warp will have to be 6 times longer than the ground warp. Thus if the rug is supposed to be 5 feet long, we must have 30 feet or 10 yards of pile warp, and about 3 yards (counting wastage etc.) of the ground warp.

In the ground we shall have 12 warp ends per inch, and in the pile 8 ends per inch. If our rug is 30" wide, this means 360 ends for the ground warp, and 240 for the pile warp.

We make first the ground warp as usual, beam it, thread and slay. To be able to do this we must have the draft which is as follows: (fig.5)



The draft shows two repeats or one inch in our case. The strokes under threading indicate the slaying (passing through the reed). The reed will be therefore No.8.

When threading the ground warp we must leave empty heddles on frames 1 and 2 as indicated by the draft.

Now we make the pile warp with 240 ends, beam it on the lower of the two additional warp beams, and thread in the empty heddles on frames 1 and 2.

We tie both warps together to the apron, and start weaving the ground on treadles 3 and 2. We keep this on until the warp is spread. If we notice that the pile warp makes loops, it means that it has too little tension. Make one more turn of the string on the pile warp beam or increase the weight at the end of the string. We can resort here to an empty soft drink bottle as a weight. It can be

filled with water until the desired tension is obtained.

Now we open the pile shed, insert the velvet rod, change the shed and see what happens. If the rod is only partly above the sur face of the fabric - the tension of the ground warp is too low, or the tension of the pile warp too high or both. Adjust both tensions until satisfied. And this is all. From now on follow the rythm of weaving described previously.

The treadling will be: 23231, or 23213231, or 232321323231, or even: 2323231. Try all of them and find the best.

When the finished piece is taken off the loom, it seldom looks satisfactory. In most cases it shows too much ground. The fi nishing consists first on combing the pile with a brush in all directions, then beating it vigourously with a long and flat piece of wood Try an odd lease rod, a yard stick or something similar.

In the next article on this subject we shalltake up patterns in velvet weave.

PROBLEMS IN TWILLS

Part 1

HIGH TWILLS.

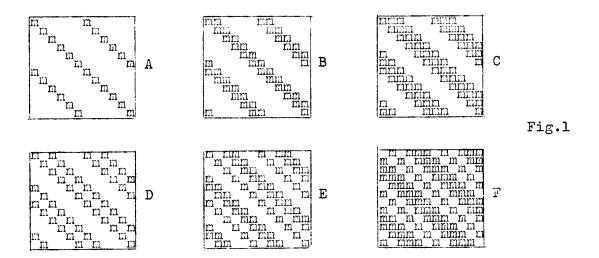
What do we mean by "high"? Let us say, anything woven on more than four frames. Therefore this article is written for "multiharness" weavers. We expect that each weaver of this class is familiar with plain biased twills of any kind. If not he can get all the information wanted from text books (Reed, Oelsner, Watson).

The following is the most important part of the theory of twills: 1-st, that you can divide one repeat of twill into as many floats as desired, provided that we do not get plain tabby as the result; 2-nd, that there must be the same number of floats on each side of the fabric (e.g. a twill: 2:3:2:1:4 is impossible); 3-rd that the twill is woven on a number of frames equal to the sum of the numbers designating it (e.g. twill 1:1:4:4 is woven on 10 frames because 1+1+ 4+4=10).

For instance a 6 frame twill can be either: 1:5 (over one, under 5), 2:4, 3:3, 1:1:1:3, or 1:1:2:2 (fig.1 A, B, C, D, and E).

It may appear that we forgot something. For instance 1:2:1:2 twill. Yes, but this twill is identical with 1:2 twill, which can be woven on 3 frames. Then we have a different twill in fig.1 F. Yes, but this is only the reverse of 1:1:1:3 twill in fig.1 D.

Thus any original twill must not be a repetition of a 3 or 4 frame twills, for instance: 1:2:1:2, 1:3:1:3, 2:2:2:2, etc. On the other hand it should not be the reverse or a variation of a twill already listed. Thus 1:1:1:3 is the same as 1:1:3:1, and 1:5:1:1, and 3:1:1:1; and 1:1:2:2 is the same as 2:1:1:2 etc.



But all this is only an introduction to what we are really interested in: the pattern twills. Multiframe twills of this kind are a distinct class of handweaving. They are always woven in one colour, — and most often in a neutral one. They have the same quality as damask — so discreet that never out of place, and so striking in their craftsmanship that thay never remain unnoticed.

They are very easy to design. We must simply observe the following rules:

- 1. In threading we change the direction at least once in the center of the pattern, or 3, 5 etc. times at the same distance from the center.
 - 2. The treadling is usually identical with the threading.
- 3. The tie-up must have one of its diagonals running all the way arross, for instance from the left hand lower corner to the right hand upper corner of the draft.

If we disregard these rules, the patterns will not be symmetrical. But why should a pattern be symmetrical? As a rule it does not need to be; the modern tendency is rather to get away from the strict requirements of symmetry.

The answer is that the pattern twills are not modern any more than they are traditional. It is a fact that they look at their best when they are perfectly squared. The delicacy of the design seems to be impaired when we use just any fancy treadling.

Therefore if we agree to weave symmetrical patterns we must know how to do it, and how to recognise symmetrical variations of the original pattern.

From our experience with 4 frame pattern weaves we remember that there is always one basic treadling which gives a straight diagonal across the fabric and at the same time a symmetrical pattern. In case of higher twills this is not true at all. There are twills which have no "woven-as-drawn-in" pattern at all, and there are twills which have two such patterns.

To illustrate this let us go back to our 6-frame twills in fig.l. The first, and third (A and C) give each one symmetrical pattern, as in fig.2 A, and C. The threading really does not matter, and we have selected the simplest.

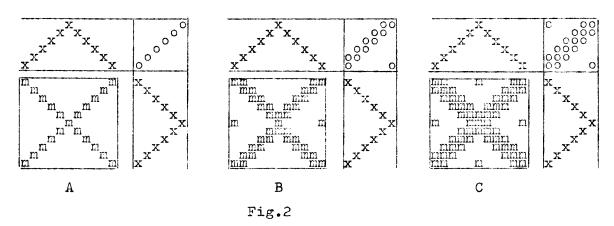
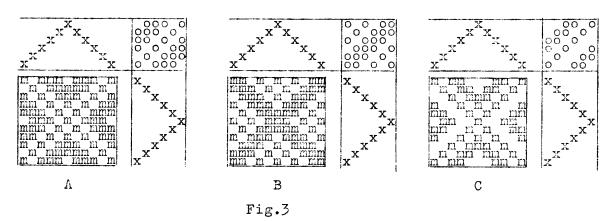


Fig. 2 B is not absolut ly symmetrical but enough so for practical purposes. For that matter all twills/which have the main diagonal with floats of 2, 4, 6 etc (all even numbers) behave in the same way.

But when we come to the twill in fig.1 D (or F), there are two ways of weaving it "as-drawn-in": we follow either the fine diagonal (A fig.3), or the heavy one (B fig.3). Finally with the twill in fig.1 E there is no way of squaring it, as long as we follow a diagonal: the pattern is always not symmetrical (fig.3 C).



So much for the "woven-as-drawn-in" patterns. In conclusion we may say that to get a perfect twill of this kind, we must select one which has a tie-up perfectly symmetrical to one of its diagonals. For instance 2:1:2:3 - the diagonal to be followed must be 1 or 3. But a twill 1:2:1:4 will not do.

In the next article on this subject we shall see what can be done with higher twills woven in "rose fashion", or without diagonals crossing the woven piece.

WE HAVE A CERTAIN NUMBER OF SAMPLES FOR SALE.

These samples are in most cases fabrics described in the "Master Weaver". They are mounted on cards which contain the usual information about threading, tie-up, and treadling. Then the warping directions (yarn, number of ends, etc.), as well as the weft to be used, the number of picks per inch, and the finishing of the fabric. The size of the sample is 3" x 4", and the card 8%" x 11".

Our sample cards are not mass-produced, and consequently we have a very limited quantity of each weave or fabric in stock.

The following weaves are now available:

1.Crackle (pattern); 2.Crackle (texture); 3.Crepe; 4.Double Waffle; 5.Huckaback Lace; 6.Leno in warp (pickets); 7.M's-&-O's; 8.Modern Overshot (woven-as-drawn-in); 9.Modern Overshot (four colours); 10.Quilt Weave (6 frames); 11.Reinforced Basket (6 frames); 12.Rep Weave (2 block); 13.Satinet; 14. Stitched Double Cloth (6 frames); 15. Swivel (two block); 16.Summer-and-winter (bound weave); 17.Summer-and-winter (plain); 18.Three D fabric; 19.Turned Overshot (4 borders); 20.Turned Bronson Lace; 21.Turned Huck Lace; 22.Twill (diamond) in very fine silk.

The price of each sample is one lollar. When sending your orders, please specify the number of the sample, and enclose a cheque, money order, or cash. The samples are mailed first class, but not registered. If you prefer registered mail add 20¢.