

fabric to come 26½ inches from loom (to be stretched for 27 inches for the market) lay it (26 + 13% =)

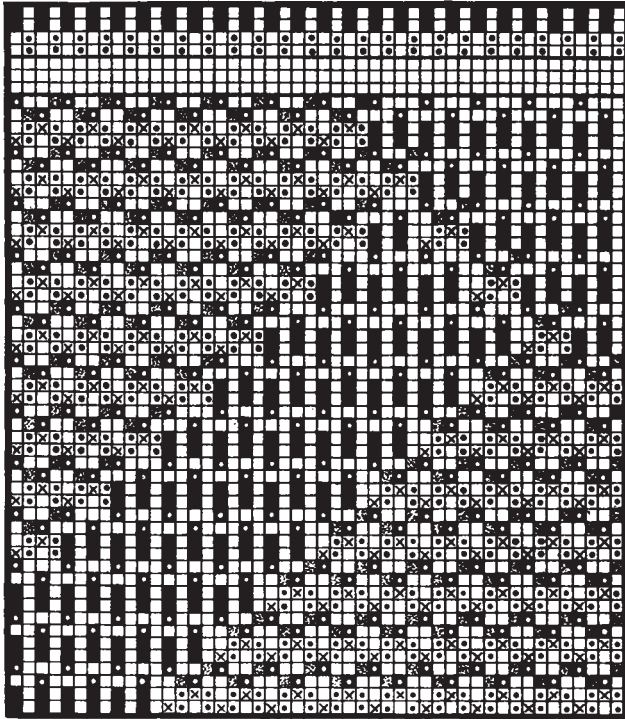


Fig. 64

30¼ inches in reed. Put 4 ends (2 figuring and 2 ground) in each dent.

Design for Plush Fabric.

The above shows the face or finishing side of a



new, original and ornamental Design for a Plush Fabric, for which lately a patent has been granted.

PLAIN, TWILLS AND SATINS.
THE FOUNDATION WEAVES FOR TEXTILE DESIGNERS.

(Continued from page 45.)

SATINS.

The characteristics of fabrics interlaced with satin weaves is that they present a smooth lustrous face, the prominent diagonal lines, characteristics to fabrics interlaced with twill weaves as previously explained, being absent.

	2	5	1		5 th pick
	1	2		4	4 th ..
		3	1	2	3 rd ..
			2	1	2 nd ..
	1	1	2		1 st ..
	1 st	2 nd	3 rd	4 th	5 th → warpthread

Fig. 17

		1	2	4	5 th pick
		2	2		4 th ..
			1	2	3 rd ..
		1	2	3	2 nd ..
		1			1 st ..
	1 st	2 nd	3 rd	4 th	5 th → warpthread

Fig. 18

Joining warp-threads in satin weaves must never be stitched in successively taken picks, but one or more must be skipped. The same also applies to picks as interlacing with the warp-threads. The points or stitches where warp and filling interlace must be scattered, as widely apart and at the same time as uniformly as possible, the farther apart and the more equally distributed they are the more indistinct they will show on the face of the fabric, hence the more attractive the latter.

Satins may also be considered as double, *i. e.*, compound twills by drafting the foundation twill by means of a double, *i. e.*, satin draw, for obtaining the satin weave. It is this intermixing of these two sets of twill lines which breaks up the characteristics of the twill, and produces the smooth satin face, although both twill lines can be noticed by a close observation, if dealing with a clear face satin fabric, viewing the latter under proper angle.

Satins are always uneven sided weaves, *i. e.*, warp or filling effect, the former being the one most often called for, filling effect, although used in connection with some plain fabric structures as face, finding its most important use with figured work, when blending the same against warp effect weaves in the formation

	3	2	5	1	5 th pick
	2	4	1	3	4 th ..
	1	3		2	3 rd ..
		2	2	1	2 nd ..
	1	1	3		1 st ..
	1 st	2 nd	3 rd	4 th	5 th → warpthread

Fig. 19

	2	3	3	1	5 th pick
		1	2	3	4 th ..
		3	2		3 rd ..
		1	2	3	2 nd ..
	1				1 st ..
	1 st	2 nd	3 rd	4 th	5 th → warpthread

Fig. 20

of figured designs, both for harness and Jacquard work.

The lowest number of harness a satin can be made on is 5, after which, with the exception of 6, they can be constructed for any number of harnesses, 16 being about the largest satin we may come in contact with; 5, 8, 10 and 12 are our favorite satin weaves used in the construction of fabrics as well as for foundation for derivative weaves like granites, crepes, etc.

Rule for Constructing Satins.

Divide the number of harnesses you are to construct the satin for into two prime numbers (neither number to be a multiple of the other nor of the repeat of the weave). Either one of these two prime numbers we will call a counter. Next take either one of

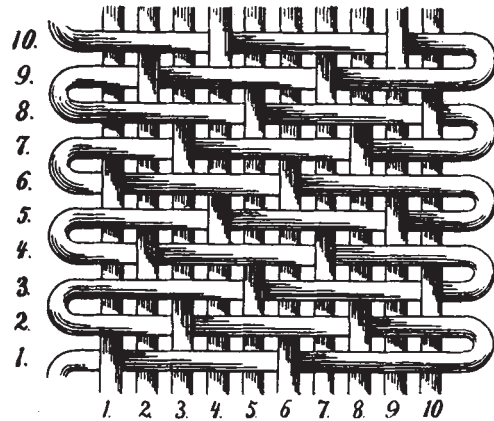


Fig. 21

these two possible counters into consideration, and add it to 1, then add it to the sum, and keep this adding of the counter to the last sum obtained continually up, until the repeat of the weave is obtained. During this procedure of counting out our satin, take at the same time into consideration that in the construction of such a satin weave, we only deal with one repeat of it and for which reason any number of a sum, whenever coming in the second repeat of the weave, has to be transferred to its proper number in the first repeat, and next considered there. For example, if in connection with a 5-harness satin, the sum calls for 8, this means then (8 minus 5 =) 3 for the number to be taken in place of 8. In other words, the 8th warp-thread in a 5-harness satin constructed with more than one repeat equals the 3rd warp-thread in the first repeat of this weave.

Explanations given with reference to counting-off warp-threads refer also to the picks.

Diagrams 17, 18, 19 and 20 are given to illustrate subject of how to construct satins, showing the four possible ways of constructing the 5-harness satin.

$5 = 2 + 3$; either number can be taken as counter, we using both, one after the other.

The small numerals (1, 2 and 3) in the four diagrams represent the counting-off with 2 or 3 respectively; the large numerals (1, 2, 3, 4 and 5) show the sum obtained by counting-off with 2 or 3, and are the places where warp and filling must interlace to produce the satin weave in the fabric. These five numerals then mean warp up, *i. e.*, stand for rises in the weave for the filling effect satin.

All four diagrams of counting-off (Figs. 17, 18, 19 and 20) produce the same 5-harness satin.

Figs. 17 and 20 are exact duplicates considered as a weave on the point paper, and so are also Figs. 18 and 19. Turn again either of the two sets of duplicate weaves 45 degrees, and you will have the same weave, hence only one pure 5-harness satin possible to be constructed from the point of weave formation. Considered however, from a practical point of manufacturing, these two 5-harness satins thus formed are

different weaves; which arrangement to use depends on the nature and character of the fabric to be made.

Coming back to the construction of diagrams 17, 18, 19 and 20 we find the following data as to construction of weaves observed:

Fig. 17: Used 2 as counter; took warp-threads in rotation and skipped picks.

Fig. 18: Used 2 as counter; took picks in rotation and skipped warp-threads.

Fig. 19: Used 3 as counter; took warp-threads in rotation and skipped picks.

Fig. 20: Used 3 as counter; took picks in rotation and skipped warp-threads.

Fig. 21 shows a fabric structure interlaced with the 5-harness satin, using either diagrams 18 or 19 for a weave, *i. e.*, using the five bold face numerals in said diagrams as risers for the warp-threads. Two repeats of the weave in each direction, *i. e.*, four repeats of the 5-harness satin are shown in fabric structure Fig. 21, which illustrates filling effect satin, *i. e.*, filling for face.

Fig. 22 shows weave and fabric structure in connection with a 5-harness satin warp effect, using in this instance either diagram 17 or 20 for weave, considering squares containing bold numerals as sinkers; all other squares (whether empty or containing small light face numerals) being considered as risers, *i. e.*, warp up. Connecting lines between weave and fabric structure refer to the respective warp-threads in either one.

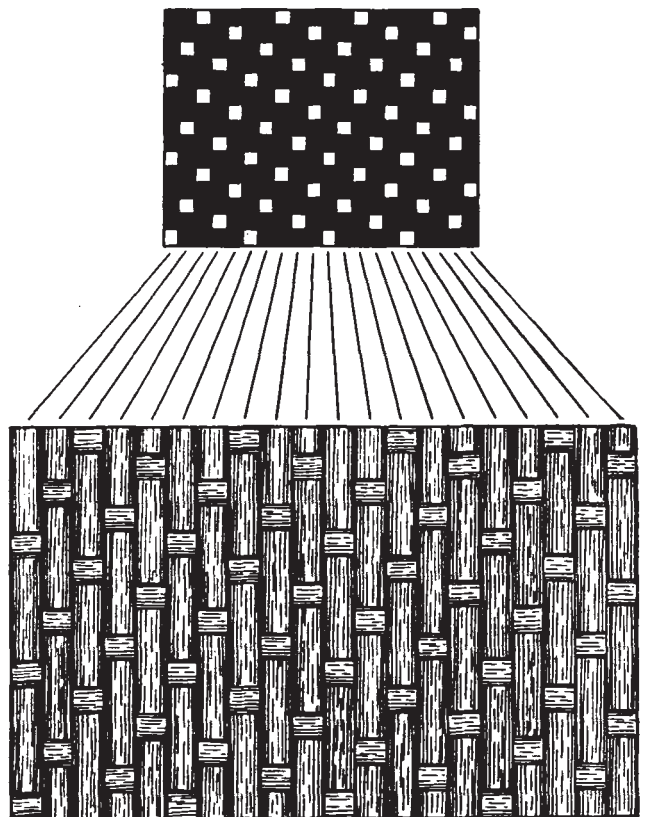


Fig. 22

As mentioned before, no regular satin can be designed for 6-harness, for the fact that 6 cannot be divided in two prime numbers, hence an irregular satin is used in place of it, as shown later on.

After 6-harness, regular satins for any number of harnesses can be designed.

In some instance irregular satins are used in place of the regular ones, for which reason the two plates

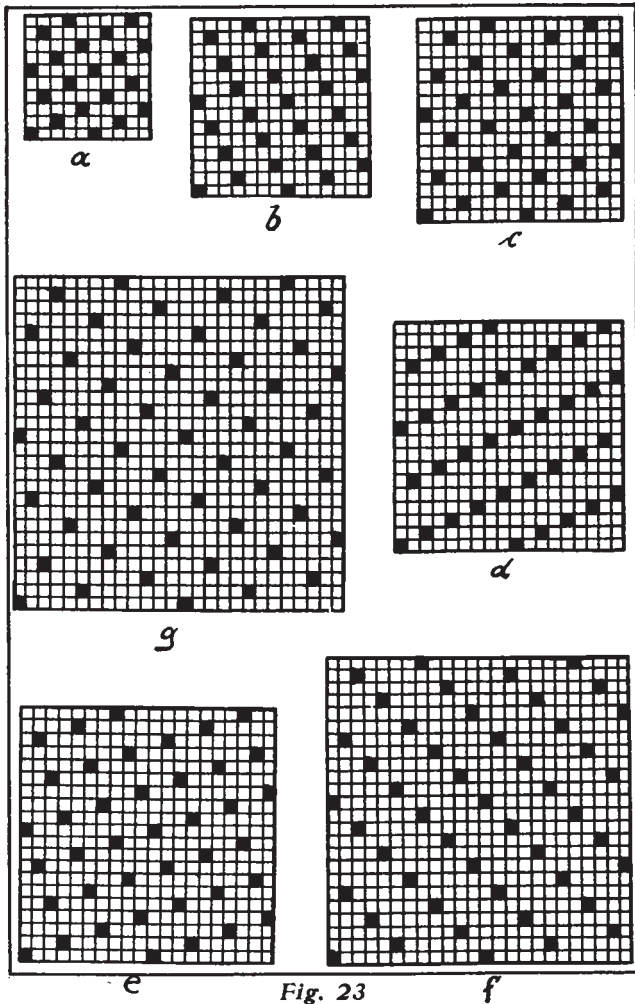


Fig. 23

of satin weaves Figs. 23 and 24 are designed, the first showing a collection of the regular satins, the other

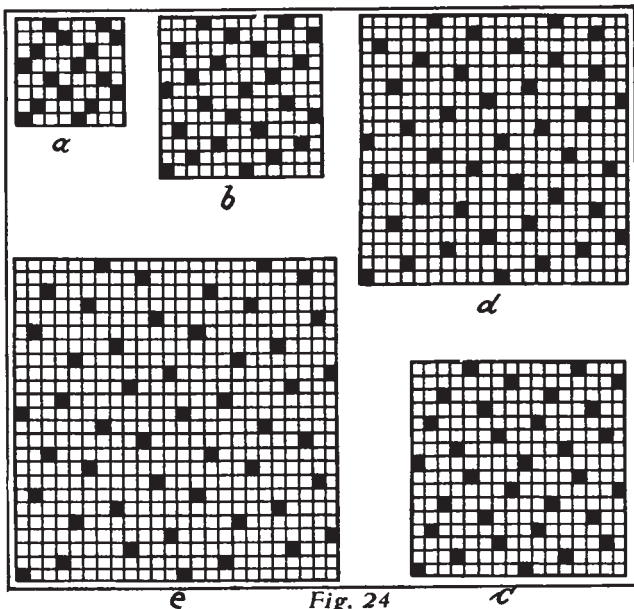


Fig. 24

a collection of irregular satins extensively used by the textile designers.

Collection of Regular Satins given on plate Fig. 23 comprises the following weaves:

- a: 5-harness
- b: 7-harness
- c: 8-harness
- d: 9-harness
- e: 10-harness
- f: 11-harness
- g: 12-harness.

Collection of Irregular Satins given on plate Fig. 24 comprise the following weaves:

- a: 4-harness broken twill, sometimes considered an irregular satin weave.
- b: 6-harness satin, known also as the crow-foot twill.
- c: 8-harness irregular satin.
- d: 10-harness irregular satin.
- e: 12-harness irregular satin.

STREAKS ON INDIGO-BLUE DYED YARNS

Caused by Micro-organisms.

The influence that micro-organisms, bacteria, and ferments may exercise in the procedure of various processes connected with the textile industry has been fairly generally recognized. Just as their more or less limited activities may be turned in some instances to advantage, so their activities may come into operation (mostly unrecognized) when not wanted.

A case of damage to dyeings through the presence of *growth* in the water employed, is mentioned in a recent number of the "Deutsche Faerber Zeitung." Yarns in the form of warp and filling had been dyed indigo-blue, and were woven together for the production of a self-colored cloth.

Certain classes of cloths do not admit of being dyed in the piece state for many reasons, although their production from dyed yarns is beset by some drawbacks. Very great care is required that streakiness of color shall be avoided.

At the plant under consideration it appeared that experience of the drawbacks connected with the work of dyeing the yarns and producing these self-fabrics had brought them to the custom of not dyeing the yarns during the spring months. They had observed that yarns dyed during those months invariably gave rise to faulty cloths, the latter showing small white streaks. A new boss dyer who was hired could see no reason in this seemingly strange procedure, hence altered the custom. Accordingly a batch of yarn was dyed in the spring-time with indigo just as it would be during the other seasons and when the fault of streakiness came into evidence during the subsequent weaving.

The trouble led to a close investigation. A few hanks were allowed to lie all day in the wet state after dyeing. An examination under the microscope revealed the presence of small white places in stripes. This afforded an explanation. In those portions of the yarn where the white places were first to be seen, small moss-stems with small air-bubbles at both ends were present. These apparent bubbles contained in reality hydrogen gas, which upon release subsequently, in the *status nascendi*, brought about a reduction of the indigo.

The indigo-white so formed on the wet yarn could be easily removed, the fibre being left white. The moss was found to be a growth inside the cistern holding water supplying the indigo vats, and when a thorough cleaning out of the cistern at the commencement of spring got rid of the trouble.