

## OUR TEXTILE SCHOOL.

### LESSON XVIII.

#### BINDER WARPS.

The same are extensively used in connection with single cloth, double cloth as well as pile fabrics in the manufacture of men's and women's wear, as well as hangings and floor-coverings.

In connection with single cloth they are generally used for the purpose of imparting strength and stiffness to the fabric, referring in this instance more particularly for fabrics for women's wear, for example, silk dress goods, etc., whereas in connection with double cloth, they refer extensively to heavy weights for men's wear, and in connection with pile fabrics to upholstery goods, draperies and carpets.

#### BINDER WARPS AS USED IN CONNECTION WITH SINGLE CLOTH STRUCTURES.

The same, as mentioned previously, refers more particularly to fabrics for women's wear, i. e., dress goods, and in order to explain the subject more in detail to the reader, the accompanying plates of weaves and diagrams, Fig. 1 to Fig. 28, are given, referring more particularly to weaves and diagrams for silk dress goods, i. e., fabrics in which the face, or the face and back, of the cloth, is formed by means of a silk warp, or a silk warp and filling, the binder warp generally being of cotton, and resting between said silk structure, more particularly when considering the face of said fabrics only. It will be readily understood that in some instances a silk warp can be used in place of a cotton warp for the binder warp in order to be able to pronounce the goods as all silk fabrics.

For the face warp, as a rule, for these fabrics we have to select loosely interlacing weaves, and which, if used by themselves, would result in a fabric of insufficient stiffness to stand the demand of the trade, and

it is for this reason that the binder warp is introduced, since we must have these loose weaves for the face of the fabric in order to give the latter the required high lustre and smoothness, a feature characteristic to loosely interlacing weaves, like for example, satin weaves, rib weaves, etc., etc., since the longer the float of the warp threads, the more chance for showing up the lustre of the yarn. It will be at the same time readily understood by the reader that these long floating warp threads naturally provide the means for completely hiding the tight interlacing binder warp threads, the latter actually resting in the body of the structure, leaning in some instances more or less towards its back.

Weave Fig. 1 shows us the  $1-4$  5 leaf satin, warp effect, a weave extensively used in the manufacture of silk dress goods. The repeat of the weave is 5 x 5.

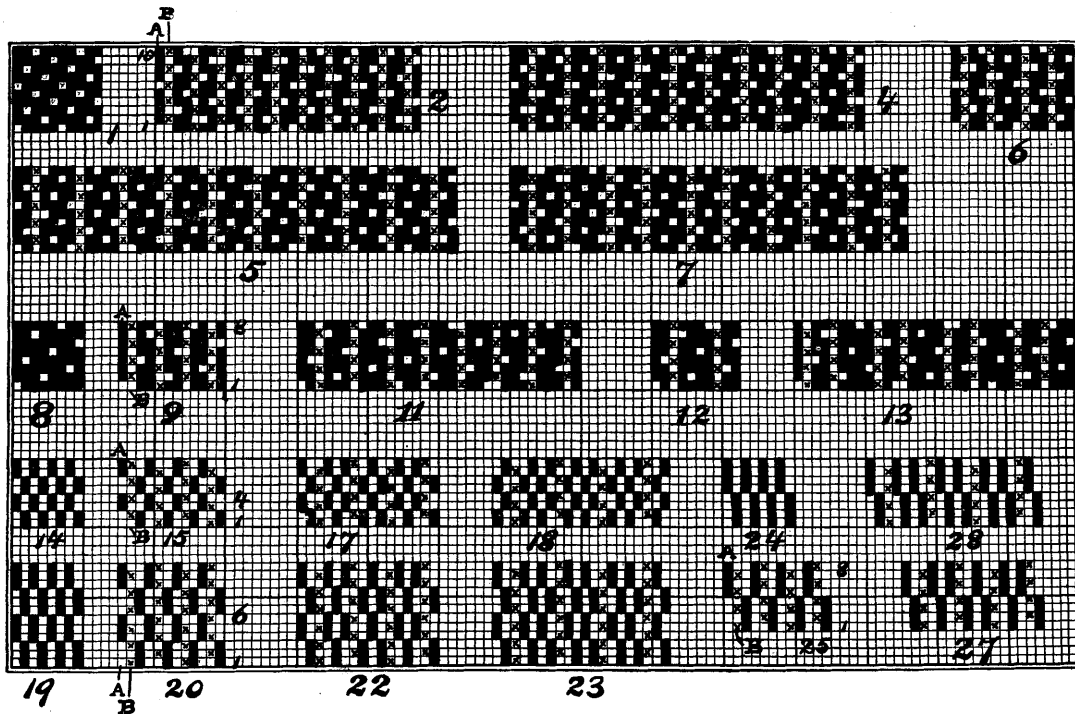
Weave Fig. 2 shows us this 5 leaf satin arranged with a binder warp, 2:1, the repeat of the weave, i. e., the combination of the 5 leaf satin and the plain weave, 2:1, is 30 x 10. We have shown the 5 leaf satin by means of ■ type, whereas the plain weave is shown by means of □ type.

Diagram Fig. 3 is given more particularly to show the interlacing of one end of the satin warp and one end of the binder warp, letters of reference A and B respectively in this diagram being selected to correspond to the same letters of reference in weave Fig. 2, i. e., the warp thread A in diagram Fig. 3 shows the interlacing of the first warp thread in weave Fig. 2 with its respective picks, warp thread B in diagram Fig. 3 showing the interlacing of the second warp thread in weave Fig. 2 with its picks, two repeats of the weave Fig. 2 being given in diagram Fig. 3, indicated respectively by twice calling the numerals 1 to 10. Closely examining the interlacing of warp threads A and B in diagram Fig. 3 will show us the difference of the interlacing of these two threads, warp

thread A interlacing twice in one repeat of weave Fig. 2, i. e., 10 picks, whereas warp thread B interlaces 5 times in the same number of picks, consequently warp thread B will take up considerable more during weaving compared to warp thread A, and for which reason the satin warp and the binder warp, each, must be run off its own warp beam, in order to furnish sufficient warp from the binder beam warp to accommodate the satin warp, i. e., more length of binder

acter of and use for the fabric in practical wear.

Weave Fig. 5 shows us the same 5 leaf satin used in connection with a plain binder warp, the combination between both being, 4 satin:1 binder, the satin warp in this instance again more predominating than the binder warp in amount of ends used between each other as compared to weave Fig. 4, previously given. The repeat of weave Fig. 5 is 50 x 10.



warp will be required compared to satin warp in a given length of woven fabric.

This difference with reference to take-up of satin warp as well as binder warp, at the same time also refers to examples of weaves, Figs. 4, 5, 6 and 7, and for which reason, explanation given will at the same time refer to this item in connection with weaves quoted.

Weave Fig. 4 shows us the 5 leaf satin arranged with a binder warp (plain weave) arranged 3:1, the repeat of the complete combination weave being 40 x 10. The only difference between weaves Figs. 4 and 2 is, that in the former more satin warp is used compared to a given number of binder warps; which to use depending on the char-

acter of and use for the fabric in practical wear. Until now we have always used a regular number of satin warp threads in proportion to each binder, a feature which is not always the case, since for one reason or the other we may have to change this proportion, weaves Figs. 6 and 7 showing two such examples, viz.:

Weave Fig. 6 shows the combination of the 5 leaf satin with the plain binder warp and arranged 2:1:3:1, the same being a medium between the arrangement used in weaves Fig. 2 and Fig. 4; repeating on 7 x 10, and may be used, when, for example, weave Fig. 2 would produce too stiff a fabric, whereas weave Fig. 4 would be the opposite, hence weave Fig. 6 the medium between, i. e., the proper combination of satin threads and binder threads to use.

Weave Fig. 7 shows us the combination of this 5 leaf satin and the plain binder, arranged 3:1:4:1, i. e., being a combination of satin and plain between the combinations given in connection with weaves Figs. 4 and 5. The repeat of weave Fig. 7 is 45 x 10.

Weave Fig. 8 shows us the 8 leaf satin, a weave very extensively used in connection with silk dress goods, a weave considerably

binder warp interlaces 4 times in said 8 picks. Warp thread A in diagram Fig. 10 refers to number 1 warp thread in weave Fig. 9, i. e., to the warp thread shown in ■ type and indicated respectively by means of letter of reference A on top of weave. Warp thread B in diagram Fig. 10 shows us the first binder warp, ⊠ in weave Fig. 9, i. e., the second warp thread of the complete

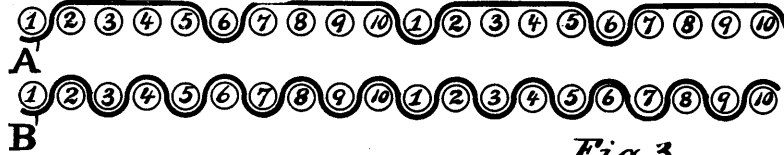


Fig. 3

looser compared to weave Fig. 1, and consequently calling more frequently for binder warps than the other. The repeat of the weave is 8 x 8.

Weave Fig. 9 shows us this 8 leaf satin arranged with a plain binder warp in the proportion of 2:1, i. e., 2 ends satin to alternate with 1 end binder warp. Repeat 12 x 8.

weave, and the one indicated by letter of reference B.

Weave Fig. 11 shows us the combination of 3 ends 8 leaf satin warp to alternate with 1 end binder warp, i. e., the combination of 3:1, being a combination resulting in a somewhat looser structure compared to the previously quoted weave, provided the same

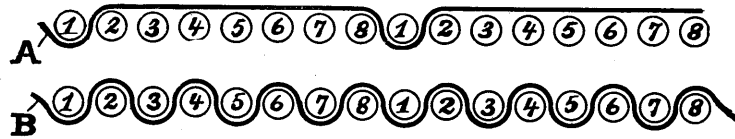


Fig. 10

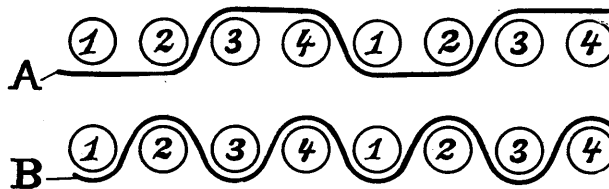


Fig. 16

Diagram Fig. 10 shows us the interlacing of one satin thread and one binder thread. In order to clearly show to the reader the difference in the interlacing in these two different systems of threads, indicating to him that each set of warp threads must come from its own beam; i. e., a different warp beam must be used for the satin warp and a different warp beam must be used for the binder warp, since the latter will take up considerably more than the former, the satin warp interlacing once in 8 picks, whereas the

number of ends were used; weave Fig. 11 repeating on 32 x 8.

Weave Fig. 12 shows us the combination of the 8 leaf satin warp with a plain binder warp, arranged 4:1, repeating on 10 x 8, and being again a looser interlacing combination weave compared to weave Fig. 11.

Weave Fig. 13 shows us the combination of 2:1:4:1, using the 8 leaf satin for face, in connection with the plain weave for binder, the complete weave repeating on 32 x 8.

Weave Fig. 14 shows us the  $2-2, 2 \times 4$ , warp rib weave, a weave more or less used in connection with silk dress goods. These warp rib weaves are always more or less loosely interlacing weaves, and when consequently a binder warp is necessary to give the fabric the required stiffness. Another feature in favor of using binder warps with these rib weaves is the fact that the rib warp forms the face and back of the fabric, and in this instance the binder warp must rest in the body of the structure, not being visible either on the face or the back, and when consequently a cotton binder warp will be completely hidden between the rib warp, on both sides of the fabric, hence no objection to a cotton binder warp in connection with

viz.: 1 to 4. Letter of reference A in diagram Fig. 16 refers to the interlacing of the first warp thread in weave Fig. 15, i. e., to the thread indicated by means of letter of reference A on top of the weave, whereas warp thread B in diagram Fig. 16 refers to the warp thread indicated by means of letter B in weave Fig. 15.

Weave Fig. 17 shows the combination of the warp rib given in weave Fig. 14, in connection with a plain binder warp arranged 3:1, the complete combination weave repeating on 8 x 4, and being a somewhat looser fabric structure than the one given in connection with weave Fig. 15.

Diagram Fig. 18 shows us the same warp rib weave as used in connection with weaves

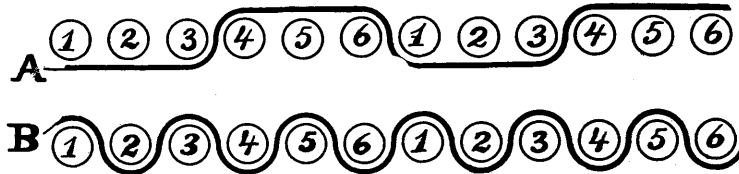


Fig. 21

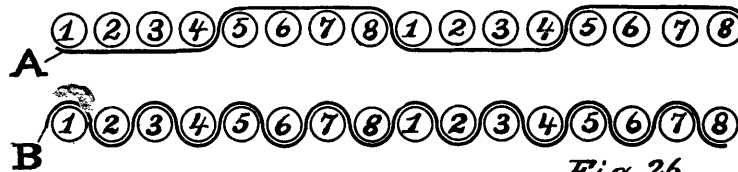


Fig. 26

these fabrics, with reference to general appearance of the fabric on both the face and back.

Weave Fig. 15 shows us this  $2 \times 4$  warp rib weave arranged 2:1 for a binder warp; the plain weave, as will be readily understood, referring to the interlacing of the binder warp, ■ type indicating the rib, or face and back warp, and □ type indicating the binder warp in this weave, which repeats on 6 x 4.

Diagram Fig. 16 shows us 2 sections of the fabric, the warp thread indicated by means of letter of reference A showing one of the rib warp threads, whereas letter of reference B indicates the section of the binder warp, as interlaces in connection with the former, a feature readily seen by means of numerals of reference for the picks being selected to correspond in both diagrams,

Figs. 15 and 17, as well as the same binder warp, the arrangement between both being in this instance 4:1, the complete weave repeating on 10 x 4.

Weave Fig. 19 shows the  $3-3, 2 \times 6$  warp rib weave, a weave very extensively used in connection with silk, etc., dress goods, in connection with a binder warp.

Weave Fig. 20 shows us this weave arranged 2:1 with a plain binder warp, the weave repeating on 6 x 6.

Diagram Fig. 21 is again the diagram respectively of a rib warp thread and a binder warp thread, showing clearly the difference in interlacing between both, i. e., the necessity of 2 beams in the loom. Numerals of reference in the filling in both diagrams A and B are selected to correspond the same as before, at the same time letters of reference A and B in diagram Fig. 21 and weave

Fig. 20 are selected to correspond, in order to simplify matters to the student.

Weave Fig. 22 shows us the same warp rib weave as given in weave Fig. 19, arranged with a plain binder warp in proportion to 3:1, the weave repeating on 8 x 6, and being a somewhat looser fabric structure than weave Fig. 20.

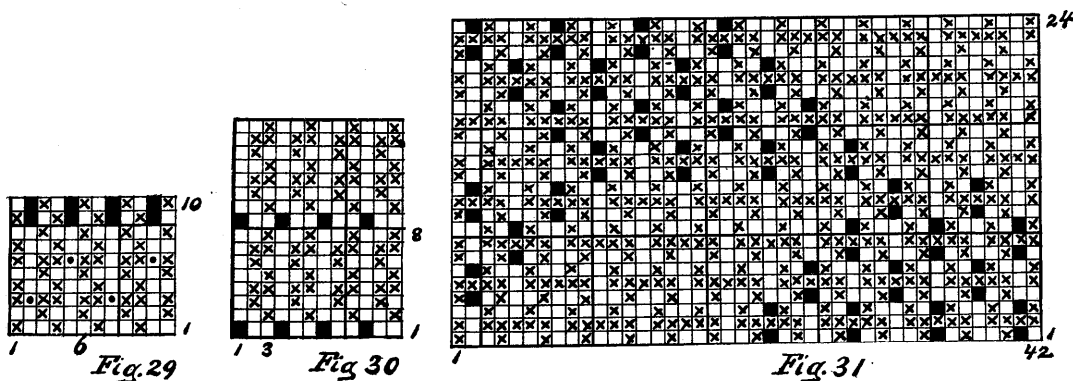
Weave Fig. 23 shows this 2 x 4 warp rib weave arranged 4:1 with a plain binder warp, the combination weave repeating on 10 x 6, and in turn is a looser fabric structure compared to weave Fig. 22.

Weave Fig. 24 shows us the  $\frac{4}{2}$  2 x 8 warp rib weave, being in turn again a considerable looser weave compared to weave Fig. 19, if referring to the same texture, and consequently will more frequently call for a the

8 x 8, and is a somewhat looser fabric structure compared to the one given in connection with weave Fig. 25. Weave Fig. 28 shows us the previously quoted warp rib weave, arranged 4:1 with a binder warp, and from explanation thus far given will explain itself at once to the reader.

Binder warp is also extensively used in connection with white figured cotton dress goods, both for plain as well as fancy effects, and for which reason weaves Figs. 29, 30, 31 and 32 are given.

Fig. 29 shows us a weave used extensively in connection with plain rib pique fabrics, the face warp in this weave we have shown by means of  $\boxtimes$  type, whereas the binder warp has been shown by means of  $\blacksquare$  type, the  $\square$  type indicating the place where said



binder warp in order to give the fabric structure for which it is used stiffness, weaves Figs. 25, 27 and 28 being for this purpose designed in order to explain the subject.

Weave Fig. 25 shows the combination of 2 ends rib warp to alternate with 1 end binder warp, repeat of weave being 6 x 8.

Diagram Fig. 26 shows under A the interlacing rib warp threads for 2 repeats of the weave, B showing the corresponding interlacing of the binder warp, both compared to each other indicating the necessity of 2-beam work for these fabrics. Letters and numerals of reference in diagram Fig. 26 correspond to letters and numerals of reference quoted in connection with weave Fig. 25, hence both will explain themselves and towards each other.

Weave Fig. 27 shows us the combination of 2 x 8 warp rib weave, 3:1, arranged with a binder warp, the repeat of the weave being

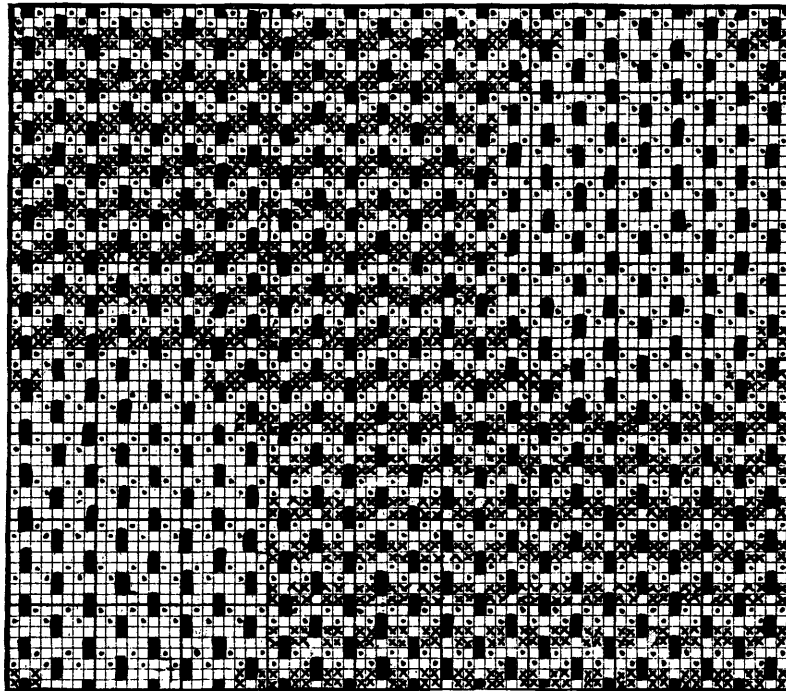
binder warp forms the back structure with a special back filling, the  $\blacksquare$  type indicating the place where it forms an impression running across the entire width of the fabric, i. e., produces the characteristic rib lines to these fabrics. The face weave of this structure is the plain weave. The binder warp will not be prominently visible on the face of the structure, its only purpose being, as previously referred to, to produce the rib lines to the fabric. The repeat of the weave is 6 x 10.

Weave Fig. 30 shows us another similar fabric structure for dress goods, in this instance bringing the binder warp prominently on the face of the structure in order to form the rib lines across the width of the fabric, said binder warp, see  $\blacksquare$  type, when not interlacing on pick 1 on the structure, floating on the back of the fabric, not interlacing with a back pick, the latter, if consid-

ering picks 4 and 7, being in this instance what we may term "wadding" picks compared to picks 3 and 6 in weave Fig. 29, and where said picks then interlace with the binder warp and form a back structure to the cloth. The repeat of weave Fig. 30 is 3 x 8.

Weave Fig. 31 shows us a fancy stitching of binder warp in order to produce figured effects on the face of the cloth, said binder warp, when not stitching on the face structure, being used with a back filling for form-

used in connection with cotton fabrics, as employed for ornamental purposes, like, for example, doilies, quilts, etc., it shows the analysis of such a fabric, i. e., the way warp and filling interlaces in order to produce the fabric. As will be readily understood, it is only a portion of a design, however, being sufficient to explain the application of a binder warp for such fabrics. The arrangement of the warp in this diagram of a weave, or portion of a weave, as we may call it, is 2 ends figure warp to alternate with 1 end



*Fig. 32*

ing the back structure. It will be readily understood, that the stitching of the binder warp, as shown in ■ type, produces or forms impressions in the face fabric, according to the figure employed for the motive of stitching. Repeat of weave is 42 x 24.

The term binder warp as used in connection with weaves Figs. 29, 30 and 31, is frequently also referred to as the back warp, it being a back warp, which by means of binding visible on the face structure, produces figures upon the latter, hence this characteristic name "binder warp" well adapted for it.

Weave Fig. 32 refers to a binder warp

binder warp. The figure warp is shown by means of ☒ type, and □ type respectively, using ■ type for the binder warp on account of the latter being the important subject for this lesson. The arrangement of the filling is 2 picks fine to alternate with 2 picks coarse. The figure warp should in this instance be of a higher count than the binder warp, using for example, 20's cotton for said figure warp in connection with 36's cotton for the binder warp. With reference to the filling, picks 1 and 2 in portion of weave Fig. 32, having quoted counts of yarn for the warp before, will call for 2 fine picks, about

60's cotton for ground, whereas picks 3 and 4 call for 2 coarse picks, say about 8's cotton for figure (spot on face) of the fabric. A good texture to use in connection with counts of yarn quoted is a reed 30 x 3 (split the 2 figure threads by means of a dent) with 140 picks per inch.

The fabric thus described can be woven on a jacquard loom or on a dobby loom. In either instance the loom should be specially mounted for weaving these fabrics. The figure warp is operated in either case independent from the binder warp, the latter being drawn on 2 or 4 special harness calling for the  $2\text{---}2$  x 4 common rib weave for its interlacing all over the fabric; thus the interlacing for the figure warp is stamped on the jacquard cards, or on the chain built for the dobby direct from the motive, and not from the analysis of the fabric structure, as shown in connection with Fig. 32.

Two figure warp threads are used for one line on the design, they being operated in

actual intricate work in the construction of these fabrics is done by means of the special construction and mounting of the loom, the designing in itself being of the most simple nature.

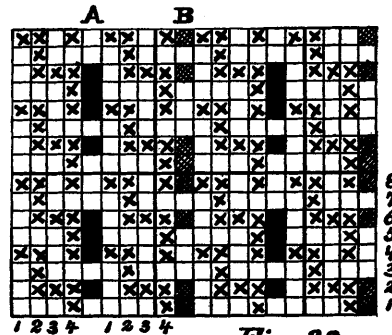


Fig. 33

We will now quote a few examples with reference to heavy weights for men's wear, and where the binder warp is used for the special purpose of combining two special fabric structures into one. Such a case fre-

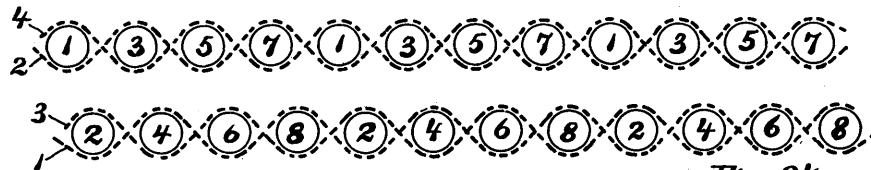


Fig. 34

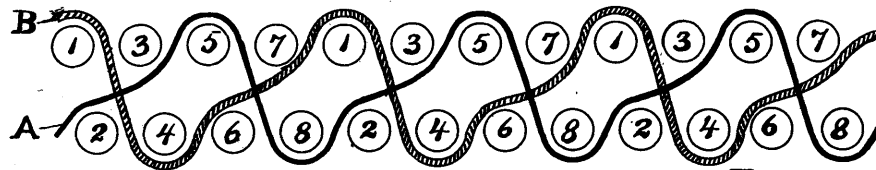


Fig. 35

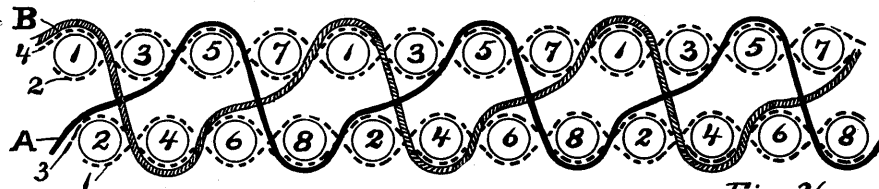


Fig. 36

quently happens when dealing with double faced fabrics where one structure is of a totally different color than the other, for example, large checks for fancy backs, and where the use of the back warp for interlacing with the face structure would have a tendency to show the colors through on the

unison from the jacquard machine or dobby for determining size and shape of figure according to the design on the 2 coarse picks, but are raised  $1\text{---}1$  or  $1\text{---}1$  respectively, on the 2 fine picks by means of 2 compound harness weaving on those 2 picks common plain weave. Thus it will be seen that the

face. Although they will always show more or less through on account of the fibres protruding from the threads, yet by using an extra cotton binder warp for interlacing these two structures into one fabric, a great step towards reducing the evil previously re-

ferred to is accomplished, the binder warp being a fine cotton warp greatly remedying the trouble.

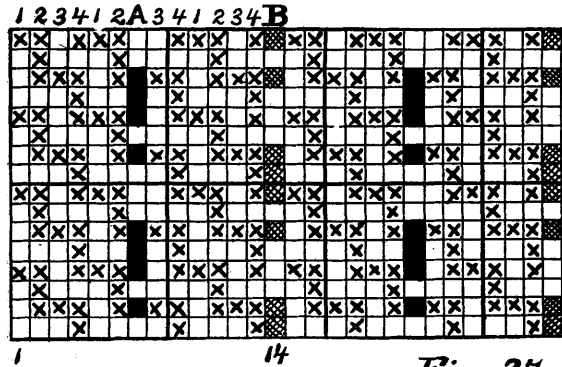


Fig. 37

ferred to is accomplished, the binder warp being a fine cotton warp greatly remedying the trouble.

In order to explain the subject, the accompanying weaves and diagrams, Figs. 33 to 44, are given, which by means of a careful study cannot help but explain the affair.

Weave Fig. 33 repeating on 10 warp threads x 8 picks shows us 2 fabric structures which interlace on the plain weave—see  $\boxtimes$  type, i. e., warp threads indicated 1, 2,

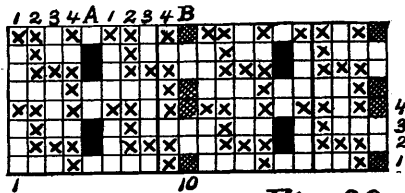


Fig. 38

3 and 4 below weave—combined into one structure by means of a binder warp, see A and B. We selected  $\blacksquare$  type for warp thread indicated by letter of reference A, and  $\boxtimes$  type for warp thread indicated by means of letter of reference B, in order to simplify matters for the student when later on studying diagrams Figs. 35 and 36, and where we selected a corresponding indication for these 2 binder threads, showing one (A) in full lines, and the other (B) in a shaded affair.

Diagram Fig. 34 shows us the double plain fabric structure, numerals of reference 1, 2,

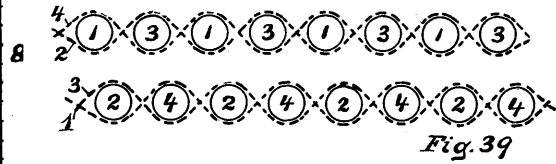


Fig. 39

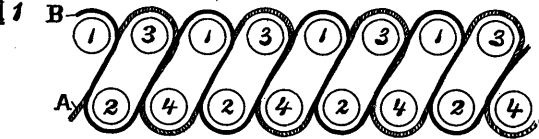


Fig. 40

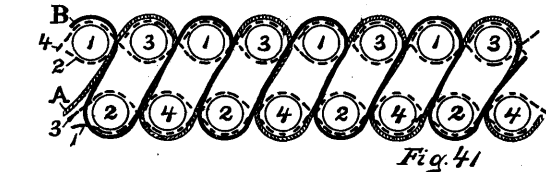


Fig. 41

the interlacing of these structures into one fabric by means of binder warp A and B respectively, the latter two letters of reference quoted referring to the same letters of reference given on top of weave Fig.

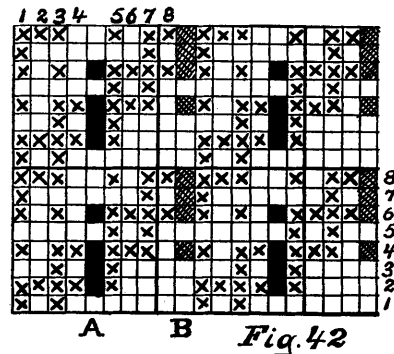


Fig. 42

33. Numerals of reference (picks) in diagram Fig. 35 are identical with numerals of reference given in connection diagram Fig. 34, hence clearly will explain the interlacing of the 2 plain fabrics into one structure by means of a binder warp.



Diagram Fig. 36 is a combination of diagrams Figs. 34 and 35, i. e., shows the interlacing of the double plain (face and back) and the combining of both structures into one by means of the binder warp. Letters of reference and numerals of reference in diagram Fig. 36 are selected to correspond with those used in connection with diagrams Figs. 34 and 35, hence will readily explain the complete fabric structure, as shown in diagram Fig. 36. It will be readily understood

whereas in the previous example, the combination was 4:1; however, since other points are identical (letters of reference and numerals being selected to correspond) no special explanation to this weave is required, in other words, it will explain itself to the student from explanation given before.

Weave Fig. 38 shows 2 plain structures interlaced somewhat tighter, more often, than given in connection with weave Fig. 33, twice as many interlacings for the binder

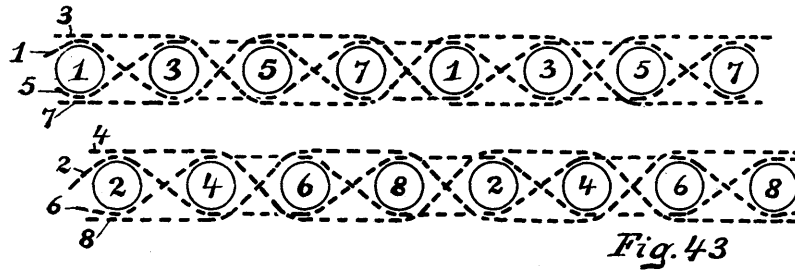


Fig. 43

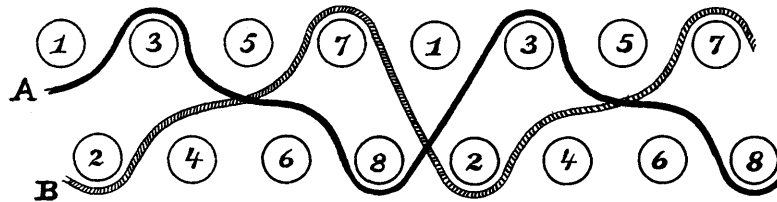


Fig. 44

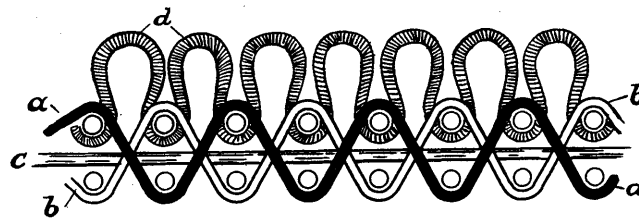


Fig. 45

that it is impossible for us to show warp threads resting in the fabric structure side by side in a diagram, and for which reason we had to show said threads, where two come side by side in the fabric, in the diagram resting above each other, a feature readily grasped by the student.

Weave Fig. 37 shows a similar weave, repeating on 14 x 8, showing the combination of 2 plain fabric structures interlaced together by means of a binder warp, the proportion, however, in this instance being 6 double plain threads: 1 binder warp thread,

warp being employed, using again the same kind of type and the same numerals and letters of reference as used before, this weave will readily explain itself to the student. Its repeat is 10 x 4, the double plain warps being shown by means of □ type and indicated respectively 1, 2, 3 and 4, and the binder warp in one instance by ■ type, in the other instance by means of ▨ type, in order to correspond to the diagram of section of the fabric given later on.

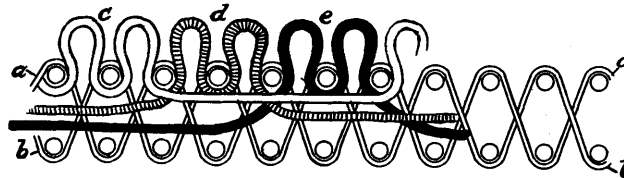
Diagram Fig. 39 shows again the double plain weave, diagram Fig. 40 shows the in-

terlacing of the two structures by means of a binder warp, diagram Fig. 41 shows the combination of diagrams Figs. 39 and 40, i. e., a complete section of the fabric showing also its interlacing of the two structures composing it, into one. Letters and numerals of reference in this illustration are corresponding to those used in connection with diagrams Figs. 39 and 40, and consequently will explain itself.

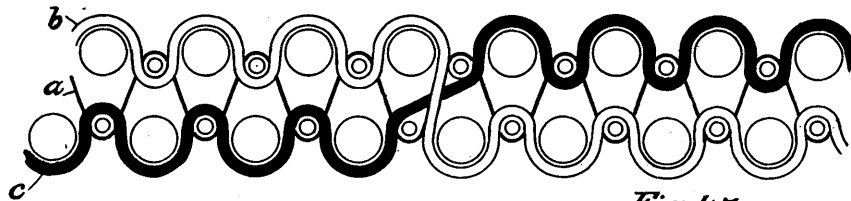
In previous given example we used the plain weave for both fabric structures, since however other weaves are used in the same way, weave Fig. 42 and diagrams Figs. 43 and 44 are given, showing in this instance

Fig. 42, warp threads A and B in both illustrations corresponding, i. e., referring to the same warp thread, viz.: A warp thread shown in full black type both in diagram and weave, and warp thread B shown in shaded type both in diagram and weave, hence will explain the interlacing of the two structures at once to the reader.

Diagram Fig. 45 is a section of a tapestry carpet showing the application of the binder warp to these fabrics. Letters of reference a and b indicate the binder warp, which in this instance, interlaces on the  $2-2$  4 harness basket weave. c is what is known as the stuffer warp and d the loops as formed by



*Fig. 46*



*Fig. 47*

the  $2-2$  4 harness twill used for both structures—see warp threads 1, 2, 3, 4, 5, 6, 7 and 8 as shown by means of  $\boxtimes$  type in weave Fig. 42 for this purpose. Warp threads A and B indicate the binder warp threads, the same being the letters of reference used for these 2 threads in connection with diagram Fig. 44, and consequently will help to simplify matters to the reader. The repeat of weave Fig. 42 is 10 x 8.

Diagram Fig. 43 shows the interlacing of the 2 structures composing the fabric by means of the  $2-2$  4 harness twill. Numerals of reference accompanying this diagram with reference to warp threads 1, 2, 3, 4, 5, 6, 7 and 8 are identical with those used in connection with weave Fig. 42, the same being the case with reference to picks 1, 2, 3, 4, 5, 6, 7 and 8 used respectively in diagram Fig. 43 and weave Fig. 42.

Diagram Fig. 44 shows the interlacing of the 2 fabric structure according to weave

means of the pile warp of these fabrics. It will be readily seen in this instance that the binder warp, a b, is not visible on the face of the fabric, however it shows on the back of the structure, being no detriment in this instance, since the latter rests on the floor, i. e., not visible to the eye when the carpet is on the floor.

Diagram Fig. 46 shows the use of the binder warp in connection with Brussels carpets. Letters of reference a and b again indicate the binder warp, c, d and e indicate the loops of a 3 frame Brussels carpet, the binder warp interlacing on the same weave as quoted in connection with diagram Fig. 45, and is not visible on the face of the fabric, resting below the loops on the back of the structure.

Diagram Fig. 47 shows a pile fabric in which a binder warp is used, the same being indicated by means of letter of reference a, letters of reference b and c indicate the pile

warp or figure warp, as the case may be, and which by exchanging positions on face and back of the fabric produces the figures to the structure, the binder warp holding the 2 figure warps by means of binder picks in place in the fabric.