THE MANUFACTURE OF BEAVER OVERCOATINGS.

(Continued from April issue.)

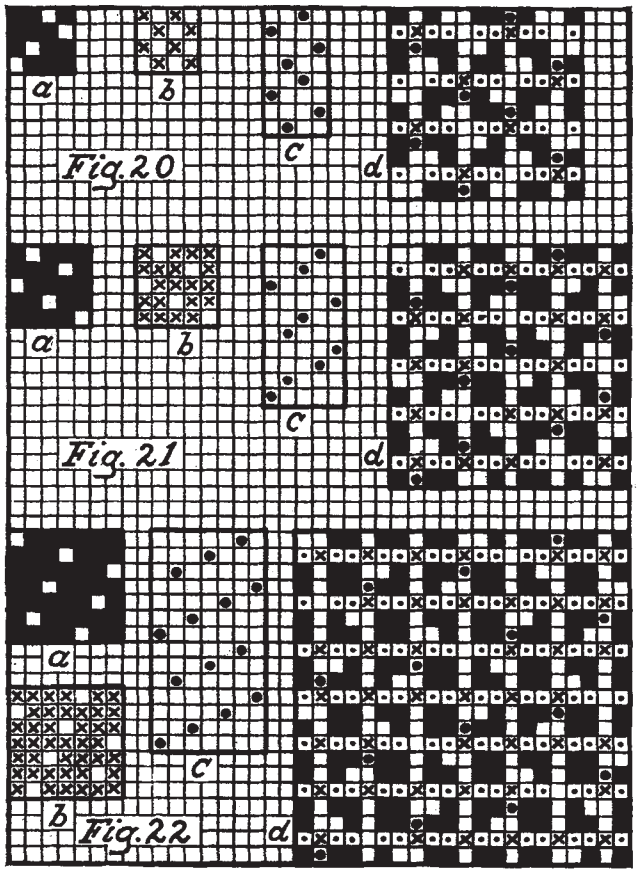


Fig. 20, *a* face weave, the 4-harness broken twill, warp effect. *b* back weave, the plain weave. *c* stitching, the 4-harness broken twill, filling effect. *d*, complete double cloth, *i. e.*, beaver weave, repeating on 12 by 12; constructed with crochet type to correspond with that used in diagrams *a, b* and *c*.

A beaver weave often met with in connection with the best grades of beaver cloth made, or imported, is given in diagram Fig. 21, the same having the 5-harness satin, warp effect, for its face (*a*) and back (*b*) weave. The stitching of both plies is done with the 5-harness skip twill, filling effect, given in diagram *c*.

The complete weave *d* repeats on 15 warp-threads and 15 picks. Crochet type is used to correspond in all four diagrams.

Fig. 22 shows us a beaver weave, which can only be used with extremely high textured goods, on account of its loose interlacing single cloth weaves, combined in a double cloth structure. The 7-harness satin is the weave used, with its warp effect for interlacing face (*a*) and back (*b*) structure, and its filling effect (*c*) for combining them into one structure. The beaver weave obtained (*d*) repeats on 21 warp-threads and 21 picks, and is a weave seldom met with, except when referring to an extra fine fabric structure, where price is of minor importance.

(4) Arrangement of Warp 2:1, Filling 3:1.

If, for example, a fabric constructed with weave Fig. 19 should be wanted in a somewhat lighter texture, or a fuller face desired, or the backing to use be of too heavy a count, *i. e.*, working through on the face, the arrangement of 3 picks face to alternate with 1 pick back will then be a most suitable arrangement to use, leaving the arrangement of face and back warp undisturbed; or in other words, we will use in proportion more face picks and correspondingly reduce the number of back picks.

Diagrams, Fig. 23 (*a, b, c,* and *d*), have been designed to illustrate the treatment. In the same

a shows the weave for the face, the 4-harness broken twill, warp effect, shown in *full* type.

b shows the weave for the back, the 4-harness broken twill, warp effect, shown in *cross* type.

c shows the stitching used, the filling effect of the 4 by 8 broken twill, broken filling ways, shown in *dot* type.

d shows the complete double cloth weave, repeating on 12 warp-threads and 16 picks; shown in type corresponding to that as was used in diagrams *a, b,* and *c,* plus *small dot* type as is used in connection with any double cloth weave for indicating the raising of every face warp-thread on every backing pick.

(5) Arrangement of Warp 3:1, Filling 1:1.

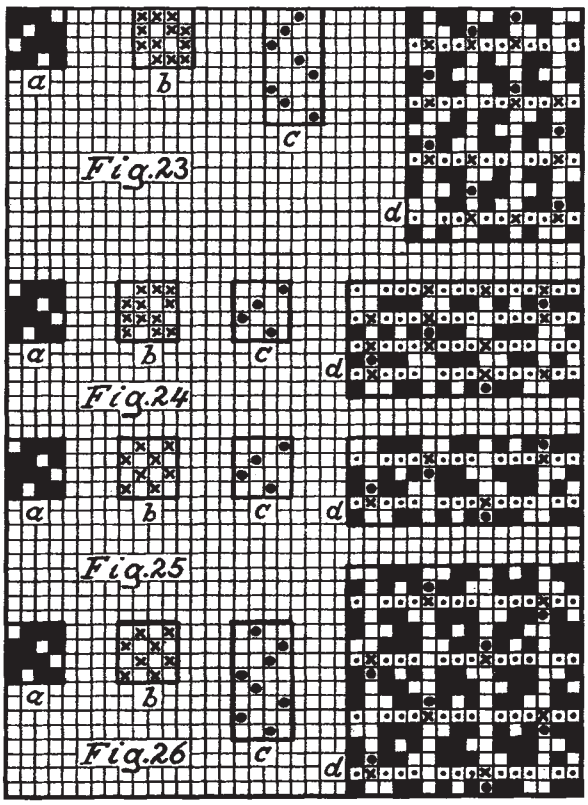
Diagrams Fig. 24 (*a, b, c,* and *d*) are given to illustrate such a combination.

a shows the weave for the face, the 4-harness broken twill; warp effect, shown in *full* type.

b shows the weave for the back, and which corresponds with the face weave, shown in *cross* type.

c shows the weave used for combining face and back, the 4-harness broken twill, filling effect, shown in *dot* type.

d shows the complete double cloth weave, (repeating on 16 warp-threads and 8 picks), executed in crochet type to correspond with such as used in diagrams *a, b, c,* plus *small dot* type as used for raising all the face warp on every back pick.



(6) Arrangement of Warp 3:1, Filling 2:1.

This combination of face and back, both in warp

and filling, is shown in connection with diagrams Fig. 25 (*a, b, c,* and *d*) and of which

a shows the weave for the face (4-harness broken twill, warp effect) shown in *full* type.

b is the weave for the back structure (the plain weave) shown in *cross* type.

c shows the weave (4-harness broken twill, filling effect) as used for stitching face and back structures, shown in *dot* type.

d is the double cloth weave repeating on 16 warp-threads and 6 picks, executed in different crochet type, to clearly show foundation weaves used in its construction, etc.

(7) Arrangement of Warp and Filling 3:1.

Such a combination of face and back, in warp and filling, is shown in diagrams Fig. 26 (*a, b, c,* and *d*) and where,

a shows the weave for the face structure, the 4-harness broken twill warp effect, shown in *full* type.

b shows the plain weave, for back structure, in *cross* type.

c shows the stitching of the two plies, *dot* type, and

d shows the complete double cloth weave, repeating on 16 warp-threads and 16 picks, executed again in different crochet type, to show the foundation weaves used in its construction.

FLYING SHUTTLES.

A shuttle never flies out of a loom without cause, but sometimes it is extremely hard for the fixer to locate the trouble. If he be a man of limited experience, he will spend many a weary hour in fruitless search, and finally have to call on a more experienced man for assistance.

The causes of shuttles flying out are numerous, and at times their actions are so irregular that to the uninitiated it does not appear reasonable to assert that a single cause is responsible. At times a shuttle will fly out of the shed repeatedly, and then it will run for hours before it will again leave the loom. A broken thread in the shed will often throw the shuttle; but as this can be easily located by the weaver, and soon remedied, nothing need be said about it.

Sometimes the picker spindle is not exactly parallel, so that the picker does not give the shuttle a straight blow, but one that deflects it, causing it either to fly out, or the loom to bang off.

Sometimes the hole into which the tapered end of the spindle fits is a little too large, and as the picker moves back and forth on the spindle, the latter moves also, imparting an uneven blow to the shuttle, thus causing it to fly out. By packing the hole with thin leather, the tapered end of the spindle will remain firm, and the spindle will not vibrate as the picker moves back and forth. If the spindle hole of the picker is not perfectly reamed out, the shuttle may be thrown out.

The sweep of the strap also has an influence on the movement of the shuttle. If the strap is made so short that the blow of the picker ball is immediately communicated to the picker stick the movement of the shuttle will be jerky, and the probabilities are that it will be occasionally thrown out. The slash or sweep of the strap should be sufficient to impart the blow of the picking ball gradually to the picker stick. The slack of the strap is first taken up by the blow, and then the force is imparted to the picker stick, with the result that the blow of the stick on the picker and shuttle is free from jerkiness.

If the picker stick is not true and square where it fits into the picker, it may impart an uneven blow or movement to the picker, thereby causing the shuttle to move out of a straight line. Anything which has a tendency to throw the shuttle out of a straight line while it is moving from box to box will cause it to fly out.

The reed forms the back guide, and the raceboard the bottom guide for the shuttle in its passage across the warp, leaving the top front and both ends open for the shuttle to leave the loom if its course is diverted by a broken thread or knot in the shed or by an uneven blow of the picker.

If the hole in the picker head is uneven it will cause the shuttle to fly out by imparting a crooked motion; but it may not do so every time, as the deflecting motion may be imparted only at intervals, and instead of throwing the shuttle out of its shed, the tip may be raised, so that it will break the warp threads. With the picking motion properly working, which includes picker, strap, spindle, and picker stick, there is not much liability of the shuttle being thrown out unless there is a defect in the raceboard or reed.

It is not a difficult matter for the skilled fixer to detect the causes of shuttle throwing when they arise from badly-adjusted pickers, too much power, defective pickers and spindles, or when the drop boxes on fancy looms are too high or too low, and he can quickly remedy them.

If the reed does not form a perfectly straight line with the back of the boxes, the shuttle will be deflected from a straight line and thrown out of the shed. A straightedge laid from box to box will always tell whether the reed is out of truth or not. A bent dent in the reed will deflect the shuttle from a straight course and cause it to leave the shed. It is the hidden or unusual defects that cause the fixer the most trouble, and these are generally found in looms provided with an iron raceway. Sometimes they are plainly visible, but they appear so insignificant that only the fixer of long experience recognizes their importance. A shuttle may get caught between the batten of the lay and breast beam, causing the batten to spring, which in turn affects the iron raceway, and the result is the same as when a bent dent exists in the reed. Sometimes the rise in the raceway is only a small spot that would escape detection unless tried with a straightedge. In such cases the fixer will be sorely puzzled to locate the trouble. The loom may be run for several hours, and the shuttle may not fly out, and then for a number of picks in succession the shuttle will strike the defect in the raceboard in such a manner that it will be thrown out every time. A worn raceway, whether of wood or iron, will cause trouble by occasionally throwing the shuttle. Whether the raceboard is dented, sprung, or worn, the only cure for it is to take it out of the loom and have it perfectly planed down.

Improvements in Dyeing.

According to a patent granted to the Sunpass Chemical Company, cotton containing moites, etc., may be dyed and bleached in one bath by employing an alkaline peroxide bath and dyes which will withstand the bleaching action of the bath.