The Manufacture of Fashioned Knit Goods

By KARL ABERLE, REUTLINGEN, GER.

(Concluded from October issue, p. 933)

This working procedure is most generally and profitably applied for the manufacture of double-sided fabrics, rib and cardigan fabrics. Best fitted for these fabrics are hand or powercardigan stitch. The position of the end needles requires special attention. It is understood that the left motion of the carriage forms the finished loop on the front, and the wale on the rear needle bed with reciprocate result while traveling to the right. At the turn of the carriage with the yarn carrier, the yarn has to be laid around the first needle similar to the above-mentioned wale, which could not be done if the end needle picked up the double loop or tuck stitch. The end needle has to project without fail on the rear right and on the left side in the front needle bed. widening needles have to be pushed into operation in this rotation. On hand and power machines there are special widening devices to take care of the carrier travel, switching and setting of needles.

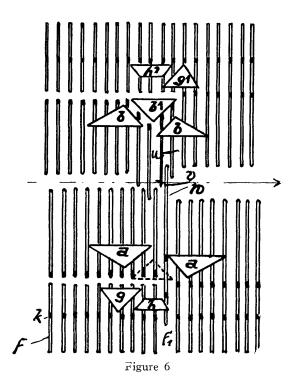
The widening of tubular work is not quite as easy and productive as on flat work. The

increasing of working needles is apt to create little openings in the fabric at the joints of the tube. Therefore, it is recommended to widen tubular work by means of the slower but superior method with decker handles. Only the improved working methods permit the widening of tubular fabric by gradual operation of additional needles.

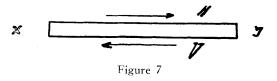
A Useful Patent

The German patent granted to G. F. Grosser, Markersdorf, covers a particular method according to which the widening of a tubular fabric is made more productive. This method is a departure from usual methods and has been satisfactorily demonstrated on knitting machines. It not only prevents holes in the fabric while increasing the number of operating needles, but it forms wales in the widened parts of the tubular fabric, which imitates the appearance of narrowed goods. The essence of this method is a conjunctive work of the end needles at the point of widening. The ad-

ditional needle of the one bed picks up the connecting loop of the other plate as a wale. An auxiliary lock (g, h, or g¹h¹, Figure 6) fittingly adjusted below the main lock (a-b) brings these additional needles into operation



automatically to add one idling needle (u, Figure 8) to the working needles in the rear when the carriage starts its travel from the right to left. The latter remain inoperative during this carriage motion and only this end needle (u) works in conjunction with the front needles (w, Figure 6) and picks up the yarn between (p & p¹).



The main locks (a, b & b¹) operate as usual on tubular work. This working procedure is illustrated in Figure 7. The letter V represents the front and H the rear needle bank. The passing of the yarn from one bed to the other is shown at (x) and the arrows point out the course formations for the tubular fabric.

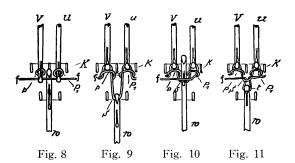
The middle cams of the locks (a-b-b¹, Figure 6) can be raised up or they work as tubular locks. In addition to the regular latch needles, special needles called springs (f) with butts (K) are set in the slots which are to be operated by the auxiliary locks (g-h-g¹h¹). As pointed out before, an end needle (u) has come into working position at the right side of the rear bed (Figure 8) to form the wale with yarn (F) of the needle bank (a¹, Figure 12). As illustrated, a kind of twist loop has been formed. Then follows the tubular course (b1) in which the loop (m1) has already been added as a normal loop. After the third tubular course (e1) with the carriage motion from right to left, the end needle (w) comes between the operating needles (V-u) through (h-g, Figure 6) and picks up the prepared yarn (f) between the loops (p-p1) in order that a wale can be formed (Figure 9). With the carriage travel to the left, in the meantime, it is possible to pull the previously picked-up yarn (F) through as a new loop (t, Figure 11) by means of wale (s) which slides behind the latch. We have now at p1 the twisted loose wale and twist loop. The cast-off cam (K) takes care of the proper cast-off of the loops. This loop formation is well illustrated in Figure 12. In the fifth course at (d1) the procedure is exactly similar to course (b1) without any alterations of the loops. It is noticed, however, that course (e1) has to be worked again like (a1) with the loose course.

Figure 12 shows the loops formed at the beginning of the work, 1, 2 and 6, 7, and the added loops, 3-4-5. These were formed by the increasing of needles and can at best be considered as widening.

Full automatic working methods for the process of widening the various double-sided rib, cardigan and half-cardigan and tubular fabrics, are constantly the objects of new inventions. Especially worth while are those improvements which bring additional needles into operation automatically. It is hard to picture a machine of recent construction without these automatic functions.

A comparison of the various existing devices indicates that all automatic operations are

controlled by means of counting chains or counting Jacquard. The German patent No. 37,957, granted to G. F. Grosser, Markersdorf, during 1885, proposes the use of counting



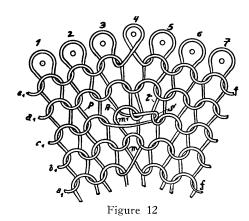
chains to bring the end needles for the purpose of widening automatically in operating position. The counting chain permits not only the regulation of the helping needles (springs) but the yarn carrier stops as well.

The older devices, of course, have their shortcomings. A particular disadvantage was the use of the helping needles or needle bed springs only to push the needles into working This required helping needles or position. springs with comparatively long shafts in order to permit the corresponding shifting of the needles, which, on the other hand, caused friction and affected the free movement of the needles in the slots. The consequence was a heavy running machine and often considerable trouble arose in finer gauges. shortcomings had to be eliminated. An improvement is the "coulier" device, the subject of German patent No. 206,184, which effects the rising of the required widening end needles independently from needles and springs. The needles are brought directly in operating position by means of a pusher adjusted on the lock which acts also on the springs independently. Even on the latest improved machines the rising of the needles is effected with correspondingly constructed helping needles.

Another interesting device of this kind takes care of the casting-off and disengaging of single loops and needles, for which purpose special needles with different butts are employed generally.

G. F. Grosser first introduced a method of engaging or disengaging single needles with

butts of the same height by means of a socalled slur bar. This bar arranges the needles into two groups simultaneously, operated by special constructed locks in such a manner that the one working group takes part in the formation of loops, whereas the other group, which has to be disengaged, is carried slightly behind the yarn carrier and cannot pick up the yarn of the latter, but does cast-off their loops. This method is particularly advisable where a change from 2:2 rib to full-cardigan or reverse is desired. This practicable device is applied with advantage on multi-section narrowing or widening machines.



On hosiery and knitting machines of ordinary construction the widening work is comparatively simple, as already illustrated. A different proposition develops on so-called doube-lock machines. The "coulier" device has to be placed between the lock mechanism in such a way that it operates alternately, once in the preceding lock and the next time in the succeeding lock to bring the needles in working position before they come within reach of the working locks.

Simultaneously with the automatic setting of the needle-bar the yarn carriers are automatically moved to the ends. If these automatic functions are controlled by paper cards, they must be accordingly punched. One hole in the card sets the shifting levers in action, whereas the full card acts reversely and makes these parts inoperative. Experience has shown that paper cards are especially adapted for the automatic hosiery and knitting machines, with corresponding increase in production.