

April 5, 1932.

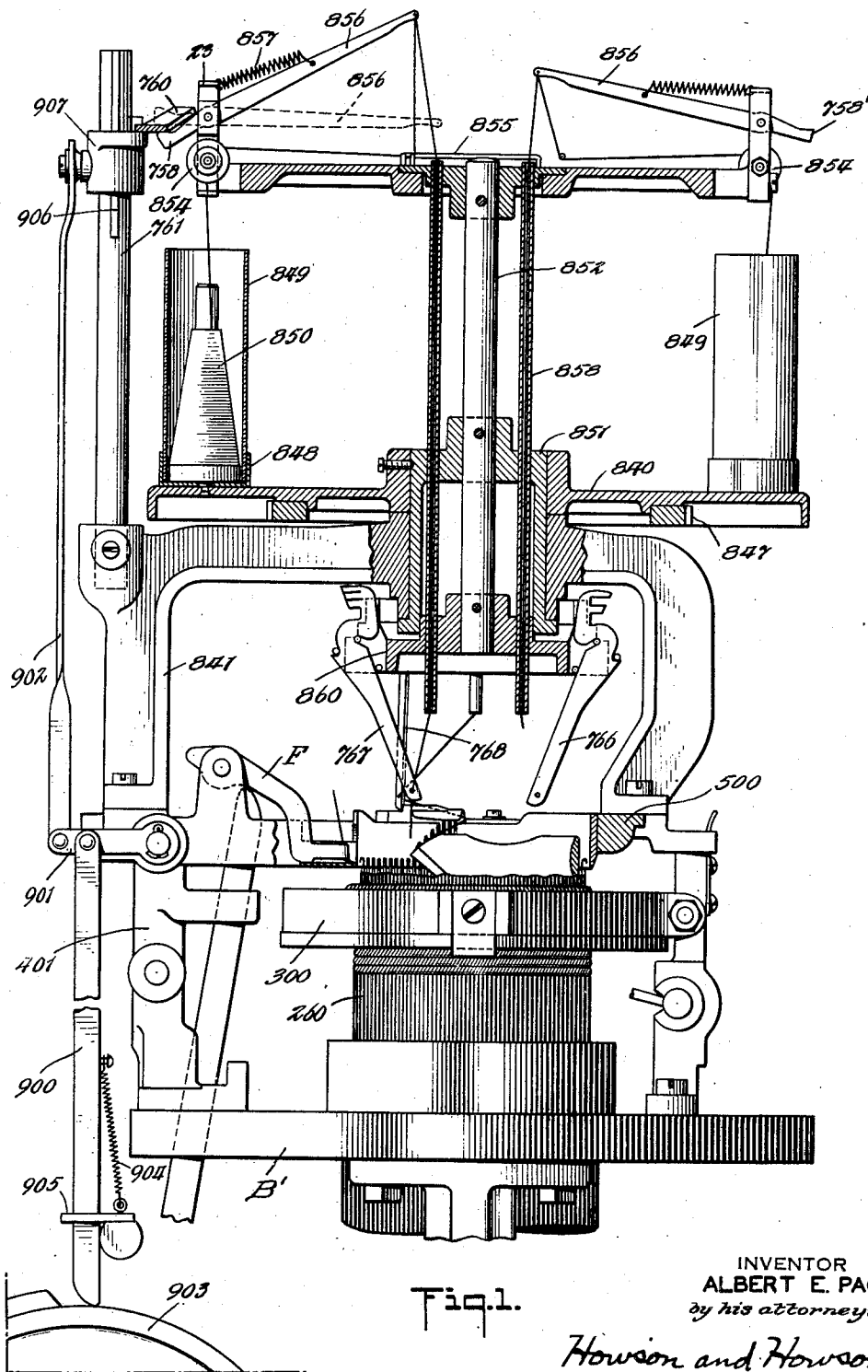
A. E. PAGE

1,853,020

YARN FURNISHING MEANS FOR KNITTING MACHINES

Filed March 14, 1931

3 Sheets-Sheet 1



April 5, 1932.

A. E. PAGE

1,853,020

YARN FURNISHING MEANS FOR KNITTING MACHINES

Filed March 14, 1931

3 Sheets-Sheet 2

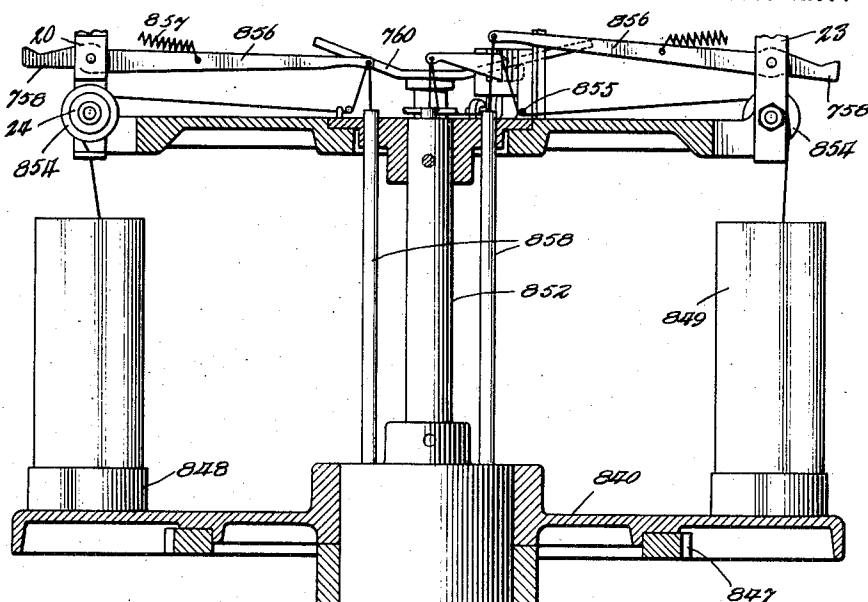


Fig. 2.

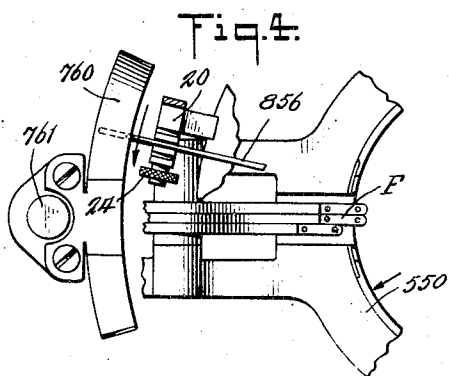
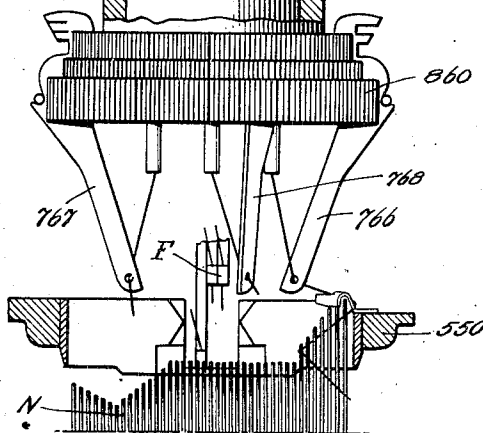


Fig. 4.

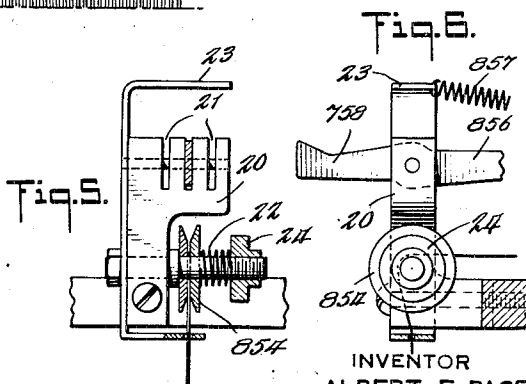


Fig. 5.

Fig. 5.

INVENTOR
ALBERT E. PAGE

by his attorneys

Howson and Howson

April 5, 1932.

A. E. PAGE

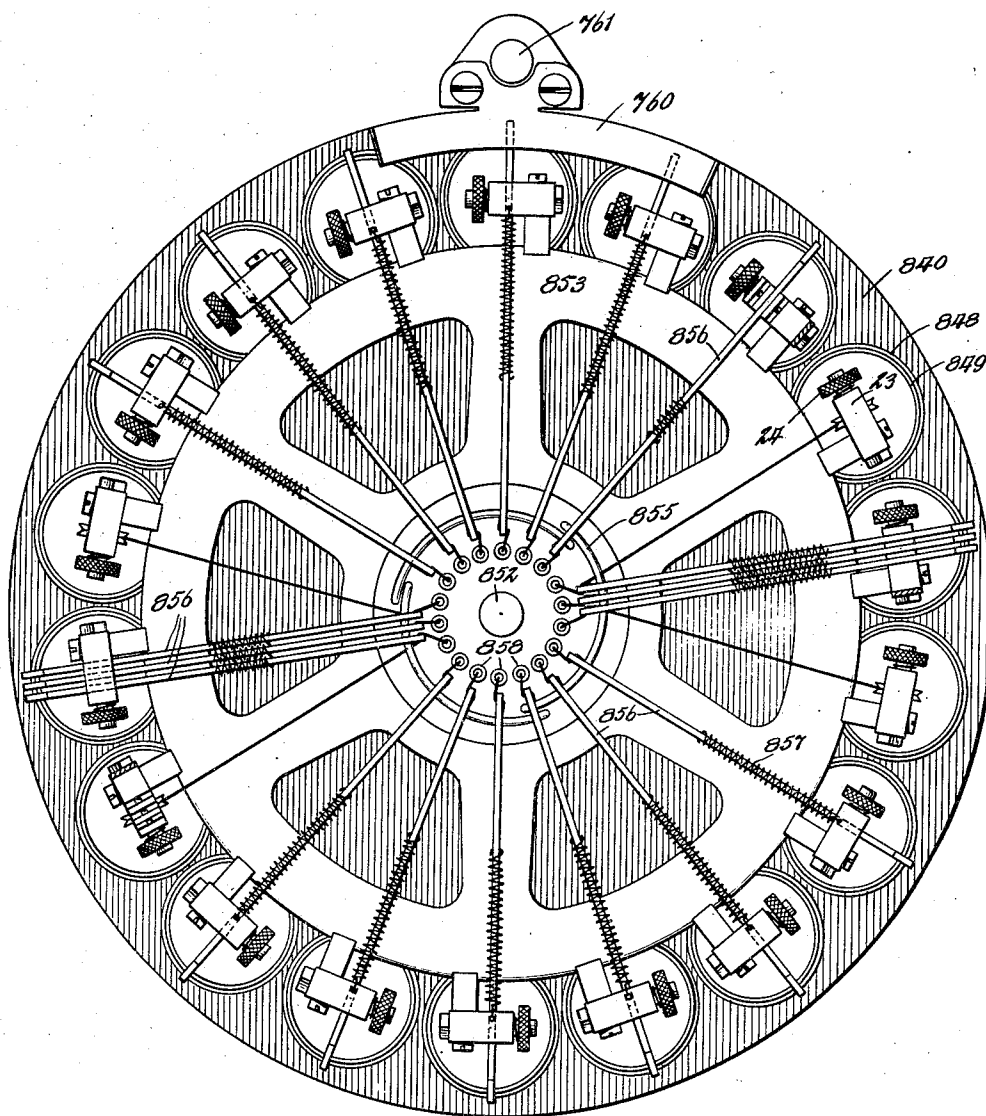
1,853,020

YARN FURNISHING MEANS FOR KNITTING MACHINES

Filed March 14, 1931

3 Sheets-Sheet 3

Fig. 3.



INVENTOR
ALBERT E. PAGE
by his attorneys

Howson and Howson

UNITED STATES PATENT OFFICE

ALBERT E. PAGE, OF BROOKLYN, NEW YORK, ASSIGNOR TO SCOTT & WILLIAMS, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF MASSACHUSETTS

YARN FURNISHING MEANS FOR KNITTING MACHINES

Application filed March 14, 1931. Serial No. 522,634.

This invention relates to knitting machines and more particularly to take-up devices for the pattern or wrapping yarns of circular knitting machines and it is an object of this invention to provide an improved take-up device of the type described which is operated so as to take up, prior to each knitting operation, a sufficient amount of yarn that may be used in a single knitting operation and to feed the yarn to the wrapping yarn guides under the tension of the take-up device during the knitting operation.

In the drawings—

Figure 1 is a view, partly in elevation and partly in vertical section of a portion of the head of a Scott & Williams circular knitting machine equipped with wrapping yarn fingers and provided with wrapping yarn take-ups constructed in accordance with this invention, the take-ups being shown raised to different take-up positions.

Figure 2 is a sectional view showing part of the structure shown in Figure 1 with the take-ups lowered as when substantially all yarn has been fed to the needles;

Figure 3 is a top plan view of the take-ups shown in Figures 1 and 2, some parts being broken away to show other parts more clearly;

Figure 4 is a fragmentary top plan view, parts being broken away, to show the relative position of the take-up operating cam to the usual main yarn fingers;

Figure 5 is a view in elevation showing the manner of mounting the yarn take-ups and their relation to the usual yarn tensioning device; and

Figure 6 is a side elevation of the structure shown in Figure 5.

The invention is shown embodied in the well known Scott & Williams seamless hosiery knitting machine, such for instance as shown and described in the patent to Robert W. Scott No. 1,152,850 issued September 7, 1915.

As shown the knitting machine comprises a revolving needle cylinder 260 having a circular series of vertically movable independent needles N, the usual singers with the sinker cam cap 300, the usual knitting cams

located below the throat plate 560 in the latch ring 550 and the usual yarn fingers F mounted on the latch ring 550. The latch ring 550 is pivotally mounted on a post 401 carried by the upper bed plate B' at the back of the machine as usual and mounted on the latch ring 550 is a bracket 841, shown as a yoke connected to opposite sides of the latch ring 550, which rotatably supports a yarn bobbin stand 840. The yarn bobbin stand 840 revolves in synchronism with the needle cylinder 260 being driven through a ring gear 847 attached thereto by mechanism such as shown and described in the co-pending application of Albert E. Page and Harry Swinglehurst, Jr., filed March 13, 1931, Serial No. 522,450.

On the upper face of the bobbin stand 840 are secured the cups 848 containing the individual bobbins 850 of the pattern yarn protected by the transparent tubes 849. Revolving with the bobbin stand 840 in an opening in the bobbin stand bracket 841 is the bobbin stand sleeve 851 and axially located in this sleeve or cylinder 851 and rotating therewith is a bobbin stand shaft 852 which projects both above and below the bobbin stand bracket 841. Above the bobbin stand 840 the shaft 852 projects above the tubes 849 around the individual yarn bobbins 850 and adjacent the upper end of the shaft 852 there is secured a take-up bracket 853 which revolves therewith. Mounted on the take-up bracket 853 above the individual bobbins 850 are brackets 20 having a plurality of slots 21. Pivoted in the slots of the brackets 20 are yarn take-up levers having the long yarn arms 856 extending radially inwardly and shorter arms 758 extending outwardly of the brackets 20. Tension springs 857 connected to the arms 856 and the extensions 23 of the brackets 20 tend to raise the arms 856 and maintain a tension of the yarns. Each yarn is fed from an individual yarn bobbin 850 to the usual tension discs 854 which are adjusted for the desired tension by the spring 22 and nut 24. From the discs 854 the yarn passes under the ring 855 to the long arm 856 of the yarn take-up and then passes downwardly in an individual tube 858 which extends through the yarn take-up bracket 853

and the bobbin stand sleeve 851 and is carried thereby. The tubes 858 project below the sleeve 851 so that the yarns emerge from the tubes 858 a short distance above the latch ring 550. Near the point of emergence of the yarns from the individual tubes 858, is a pattern yarn finger ring 860 revolving with the bobbin stand shaft 852 and which is slotted to receive a pivotally mounted pattern yarn fingers 766, 767, 768. While but three pattern yarn fingers are shown in Figure 3 it will be understood that more can be used.

The pattern yarn fingers are operated as shown in the co-pending application of Albert E. Page and Harry Swinglehurst Jr., referred to previously to wrap the yarns about the selected needles, the pattern yarn fingers being moved outside the needle circle and retained there for a suitable time but as the operation of the pattern yarn fingers forms no part of this invention the means for operating them is not shown or described but it will be understood that, as shown in the co-pending application mentioned, the pattern yarn fingers are selectively operated to wrap different numbers of selected needles.

In wrapping groups of a number of needles difficulty has been experienced in adjusting the tension discs 854 to the point where, when the machine is run at its normal speed, the tension on the yarn would not be great enough to cause the wrapping yarn to gather or pucker the fabric, to cause breaking or shearing of tender yarns such as synthetic yarns, or be too great for proper plating, and yet would be sufficient to prevent the take-ups 856 from drawing excess yarn from the bobbins when they take slack. To overcome this difficulty there is provided a cam 760 which can be slidably mounted on a post 761 carried on the bobbin stand bracket 841 and arranged to engage the shorter outwardly extending portions or tails 758 of the take-ups as the rotation of the take-up bracket 853 carries the take-ups past the cam. The cam 762 depresses the tail 758 and raises the take-up arms 856 causing the take-ups to draw from the bobbins 850 through the tension discs 854 sufficient yarn to knit on the wrapped group of needles with which the particular take-up is associated without drawing additional yarn through the discs.

All take-ups may be raised to the same angle, which draws sufficient yarn for the widest pattern being made, but if desired some of the tails 758 can be cut down as shown at 758', to Fig. 2, in order to draw a lesser amount of yarn for those patterns which only wrap a few needles. The bracket 907 on which cam 760 is mounted may be slidably mounted on the post 761 and held from rotation thereon by a key therein engaging in keyway 906 and can be shifted to either operative or inoperative position for instance

by a suitable pattern drum 903 operating through a thrust rod 900, a lever 901 and a link 902. A spring 904 is connected to a hook in guide plate 905 and on its upper end to thrust rod 900 and serves to hold the thrust rod against drum surface 903.

The thrust rod 900 may be operated by suitable cams on drum 903 to raise bracket 907 and cam 760 to its inoperative position. Also other cams or pattern indicators on drum 903 may be provided to adjust the position of cam 760 to vary the amount of yarn drawn through the tension discs by varying the extent to which tails 758, 758' are depressed.

Where a group of less than the maximum number of needles is wrapped any excess yarn will be held under tension by the action of spring 857 upon the take-up arm 856 and the take-up will draw only sufficient yarn to replace that used. While the wrapped yarns are being knit and the yarn drawn from the take-ups the yarns will be held under tension by the action of spring 857 giving uniform tension on the various yarns irrespective of the number of needles in the group wrapped and as each take-up holds sufficient yarn for its group of needles no yarn is drawn through the tension discs 854 during the knitting operation and spring 857 alone provides the tension.

The lowest point on the cam 760 is at the post 761 and, as shown in Fig. 4, the post 761 is mounted at the rear of the machine in line with the throat plate 560 of the latch ring 550 so that each take-up holds its maximum amount of yarn as it passes over the throat-plate. In this machine the knocking over point is beyond the throat plate 560 at the point indicated by the arrow in Figure 4 so that the take-ups hold the full amount of yarn before the stitch is drawn. The portion of the cam 760 beyond the post 761 towards the knocking-over point is upturned to guide the tails 758 under the cam 760 on the reverse stroke during reciprocation.

Where a plurality of pattern yarns are associated in the one stripe, the take-ups for such yarns can be mounted in a single bracket 20 as shown in Figure 3 whereby all such take-ups will be substantially simultaneously operated to draw yarn from their respective bobbins before their yarns reach the knitting point and the possibility of the rear take-up of the group not having drawn its full supply of yarn by the time it is needed is avoided.

I claim—

1. In a knitting machine having pattern yarn feeding guides, the combination of tensioning means for the pattern yarns and a take-up for gathering the slack yarn from the needles adapted to draw yarn from a yarn supply prior to the knocking over point.

2. In a knitting machine having pattern

yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides for gathering the slack yarn from the needles and means operating said take-ups to draw from said tensioning means sufficient yarn for a single knitting operation of said yarns.

3. In a knitting machine having pattern yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides for gathering the slack yarn from the needles and means operating said take-ups to draw from said tensioning means sufficient yarn to give said take-ups the maximum length of yarn required for a single knitting operation of said yarns.

4. In a knitting machine having pattern yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides for gathering the slack yarn from the needles and means operating said take-ups to draw from said tensioning means sufficient yarn for a knitting operation of said yarns, said take-ups supplying the yarn to said guides during the knitting operation.

5. In a knitting machine having pattern yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides for gathering the slack yarn from the needles and means operating said take-ups to their maximum take-up positions whereby said take-ups draw yarn from said tensioning means and gather sufficient yarn for a single knitting operation of said yarns.

6. In a knitting machine having pattern yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides for gathering the slack yarn from the needles, means operating said take-ups to their maximum take-up positions whereby said take-ups draw yarn from said tensioning means and gather sufficient yarn for a knitting operation, said take-ups supplying yarn to said yarn guides during the knitting operation.

7. In a knitting machine having yarn feeding guides for wrapping yarns about different numbers of needles and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides and means operating said take-ups to their maximum take-up positions whereby said take-ups draw yarn from said tensioning means and gather sufficient yarn for a maximum knitting operation irrespective of the num-

ber of needles wrapped by their associated pattern yarn guide.

8. In a knitting machine having yarn feeding guides for wrapping yarns about different numbers of needles and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides and means operating said take-ups to their maximum take-up positions whereby said take-ups draw yarn from said tensioning means and gather sufficient yarn for a maximum knitting operation irrespective of the number of needles wrapped by their associated pattern yarn guides, said take-ups supplying the required yarn to the respective yarn guides during the knitting operations.

9. In a knitting machine having wrapping yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-up levers between said tensioning means and guides and a cam operating said levers to their maximum take-up positions whereby said take-ups draw yarn tensioned by said tensioning means and gather sufficient yarn for a knitting operation.

10. In a knitting machine having wrapping yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-up levers between said tensioning means and guides and a cam operating said levers to their maximum take-up positions whereby said take-ups draw yarn from said tensioning means and gather sufficient yarn for maximum knitting operations of said wrapping guides.

11. In a knitting machine having wrapping yarn feeding guides and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-up levers between said tensioning means and guides, and a cam operating said levers to their maximum take-up positions whereby said take-ups draw yarn from said tensioning means and gather sufficient yarn for a knitting operation and means for mounting a plurality of said take-up levers for substantially simultaneous operation by said cam.

12. In a knitting machine having pattern yarn feeding guides arranged to wrap different numbers of needles and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and guides and means operating said take-ups to gather predetermined lengths of yarn prior to the knitting operation.

13. In a knitting machine having pattern yarn feeding guides arranged to wrap different numbers of needles and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and guides, means operating said take-ups to gather predetermined

lengths of yarn prior to the knitting operation, said take-ups yielding to supply all yarn for the knitting of said pattern yarns.

14. In a knitting machine having pattern
5 yarn feeding guides arranged to wrap different numbers of needles and means for supplying yarns to said guides comprising yarn tensioning means, yarn take-ups between said tension means and guides, means
10 operating said take-up devices to hold predetermined lengths of yarn prior to the knitting operation, said take-ups supplying and tensioning all yarn required for the knitting operations irrespective of the numbers of
15 needles wrapped.

15. In a knitting machine having pattern yarn feeding guides arranged to wrap different numbers of needles and means for supplying yarns to said guides comprising yarn
20 tensioning means, yarn take-ups between said tension means and guides and means operating said take-ups to hold uniform lengths of yarn prior to the knitting operation, said take-ups holding said yarns under uniform
25 tension during knitting operations irrespective of the numbers of needles wrapped.

16. The step in the method of furnishing wrapping yarn to a knitting machine comprising operating a yarn take-up to gather
30 sufficient yarn for the knitting operation.

17. The step in the method of furnishing wrapping yarns to a knitting machine comprising drawing sufficient yarn for a knitting operation by operation of a yarn take-up
35 after a wrapping operation.

18. The step in the method of furnishing wrapping yarns to a knitting machine comprising drawing sufficient yarn by the operation of each yarn take-up to cause all take-ups to gather a predetermined length of yarn
40 prior to a knitting operation.

19. The steps in the method of furnishing wrapping yarn to a knitting machine comprising operating a yarn take-up to gather
45 sufficient yarn for the knitting operation and feeding yarn from the yarn take-up for said knitting operation.

20. In a knitting machine having pattern yarn feeding guides and means for supplying
50 yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides, means operating said take-ups to draw from said tensioning means sufficient yarn for a single knitting operation of said yarns and means to
55 vary the maximum amount of yarn gathered by said take-ups.

21. In a knitting machine having pattern yarn feeding guides and means for supplying
60 yarns to said guides comprising yarn tensioning means, yarn take-ups between said tensioning means and the guides, means operating said take-ups to draw from said tensioning means sufficient yarn for a single
65 knitting operation of said yarns and means

varying in accordance with pattern indications the maximum amount of yarn gathered by said take-ups.

In testimony whereof I have signed my name to this specification.

ALBERT E. PAGE.

70

75

80

85

90

95

100

105

110

115

120

125

130