

April 17, 1951

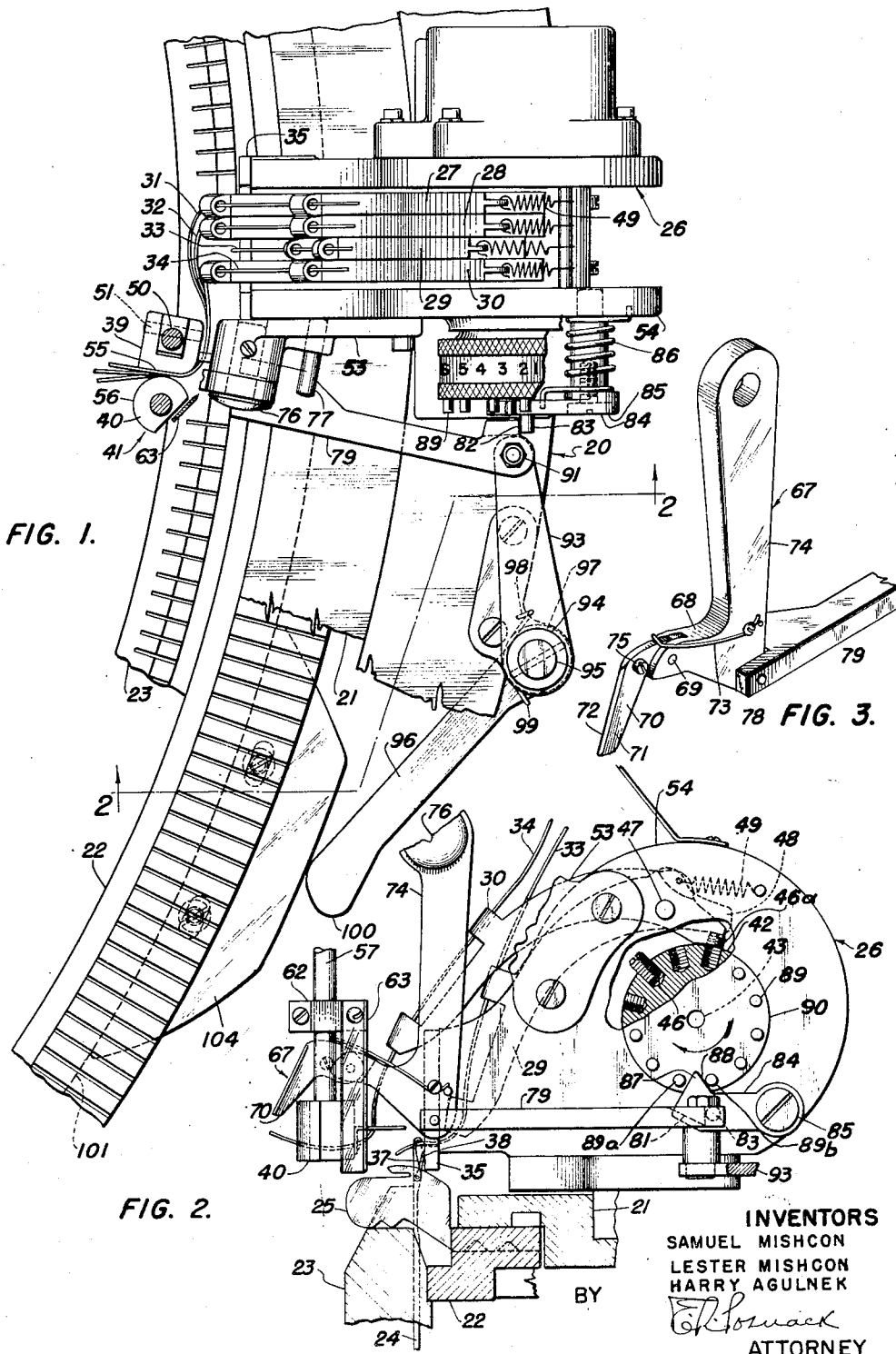
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2,549,701

APPARATUS FOR KNITTING STRIPED FABRIC

Filed April 15, 1949

5 Sheets-Sheet 1



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APPARATUS FOR KNITTING STRIPED FABRIC

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5 Sheets-Sheet 2

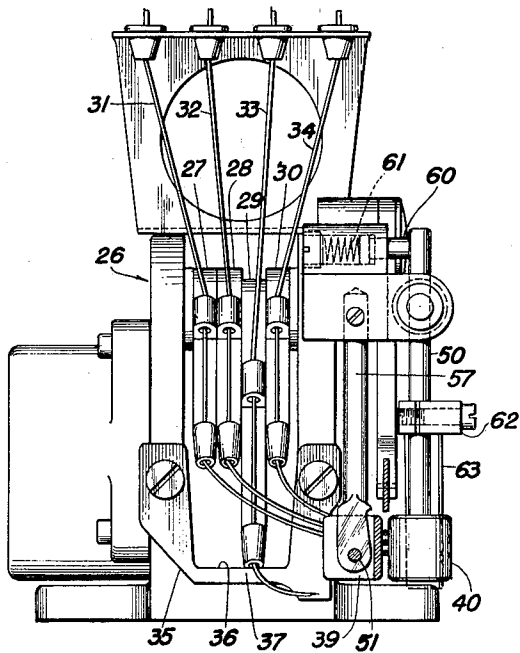


FIG. 4

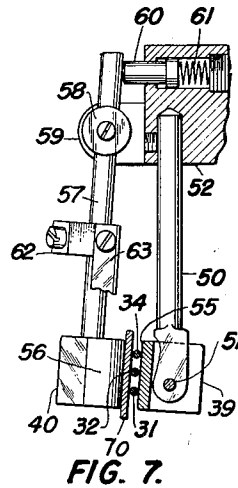


FIG. 7.

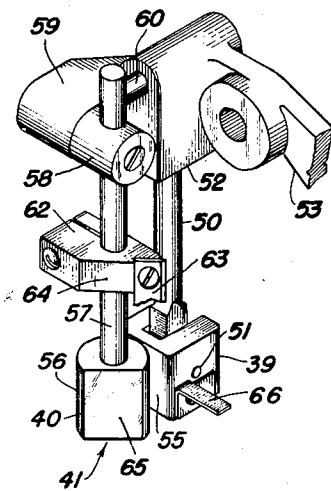


FIG. 6.

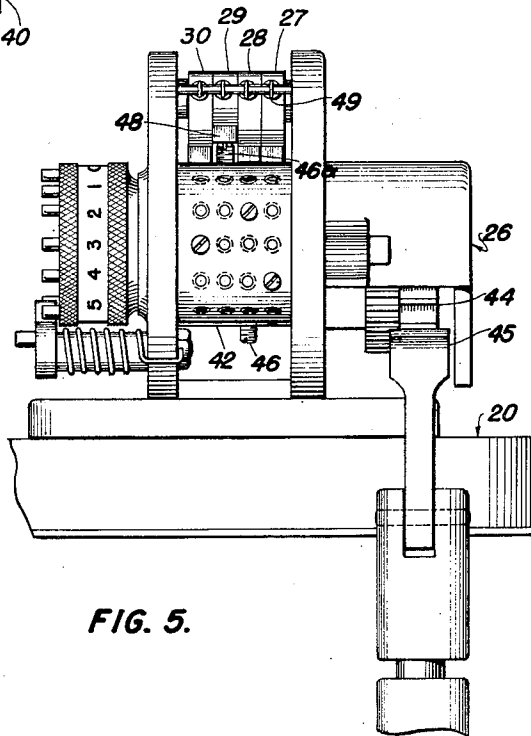


FIG. 5.

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APPARATUS FOR KNITTING STRIPED FABRIC

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5 Sheets-Sheet 3

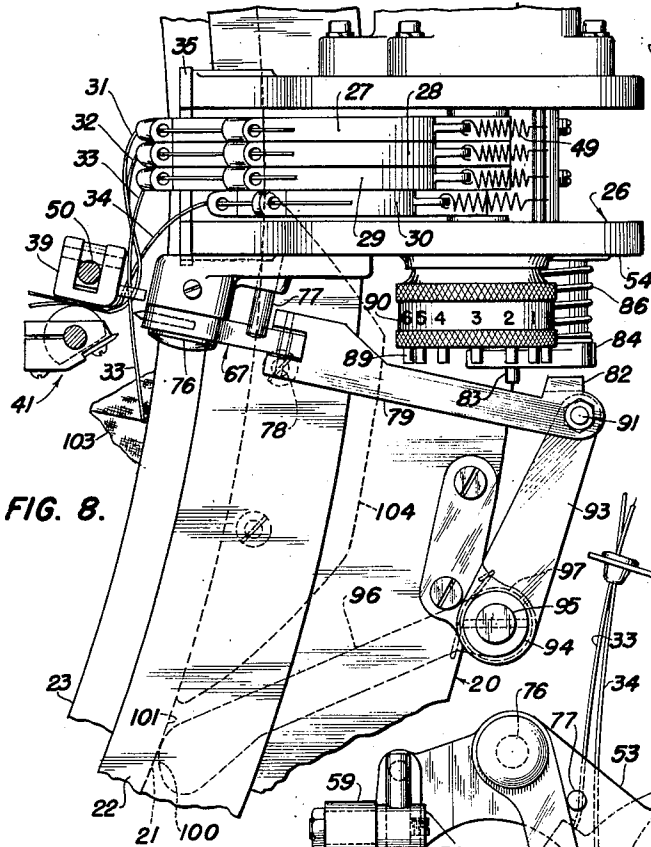


FIG. 8.

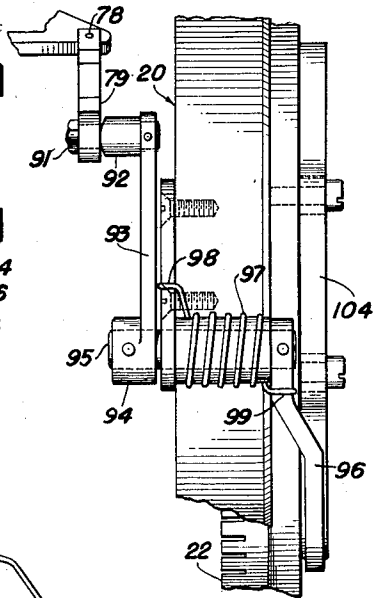


FIG. 10.

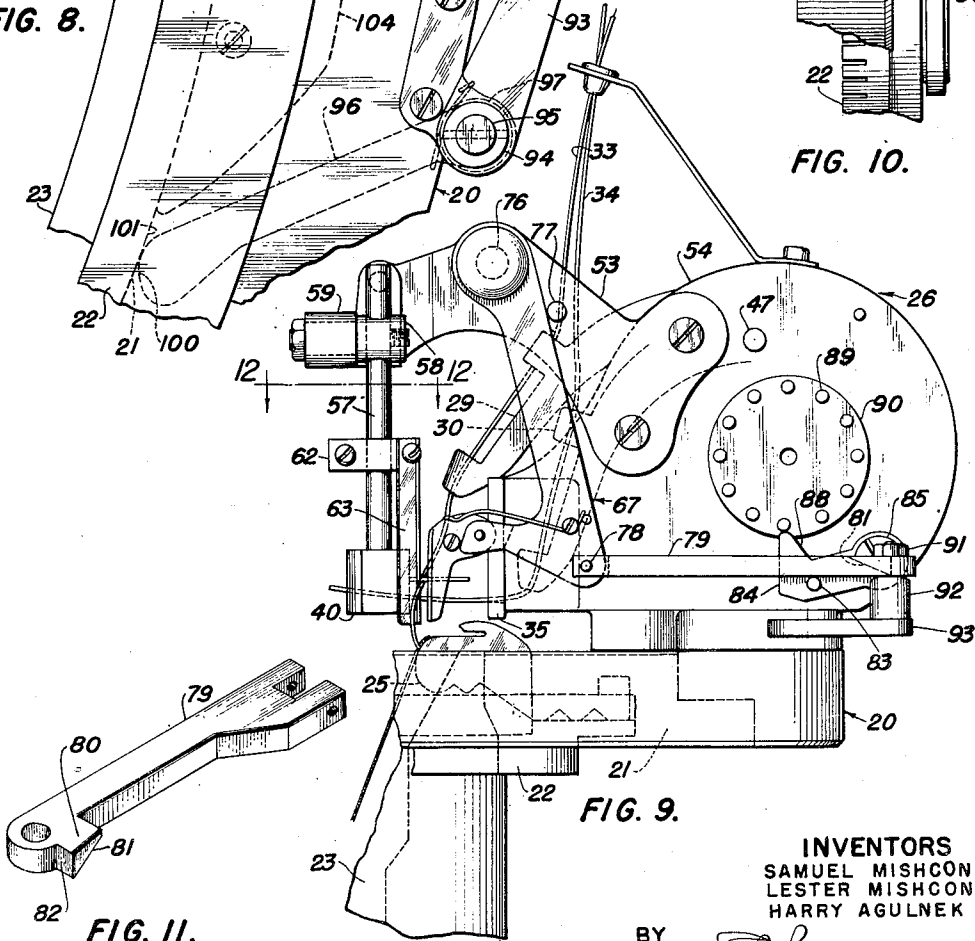


FIG. 9.

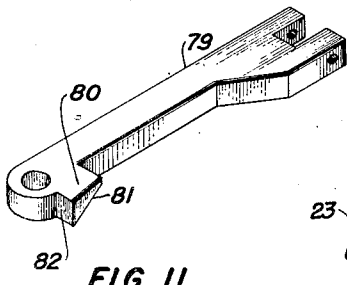


FIG. 11.

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APPARATUS FOR KNITTING STRIPED FABRIC

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5 Sheets-Sheet 5

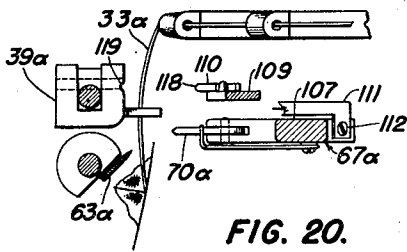


FIG. 20.

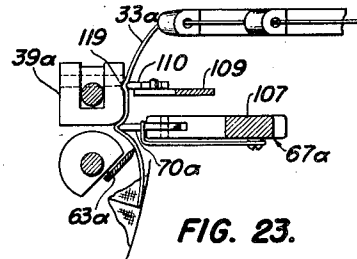


FIG. 23.

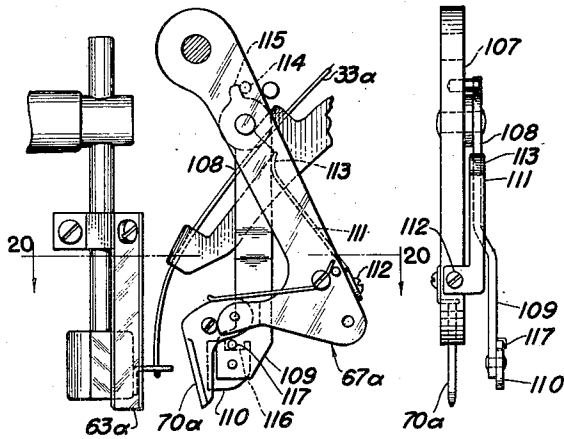


FIG. 21.

FIG. 22.

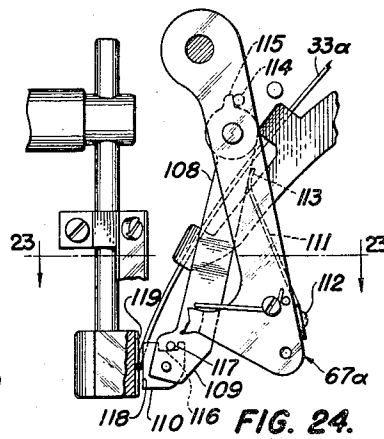


FIG. 24.

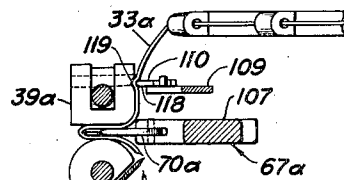


FIG. 25.

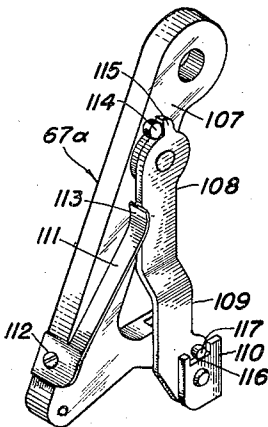


FIG. 27.

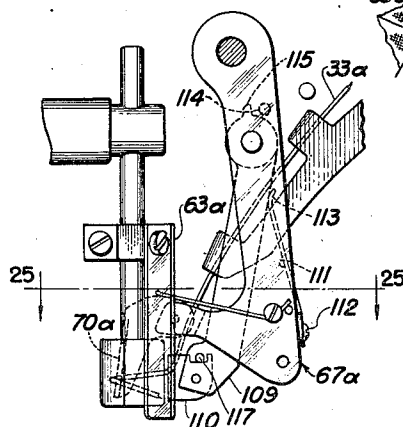


FIG. 26.

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UNITED STATES PATENT OFFICE

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APPARATUS FOR KNITTING STRIPED FABRIC

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Application April 15, 1949, Serial No. 87,634

30 Claims. (Cl. 66—140)

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This invention relates to knitting machines—more particularly to a yarn cutting and clamping device in association with striping apparatus.

In the process of producing striped fabric, particularly on circular knitting machines, a necessary step is the cutting of the knitting yarn after the change-over to another yarn. And it is also equally necessary to hold the non-knitting yarns in such manner that they may be readily brought into knitting position by the selective striping box mechanism. Various expedients have been employed to mechanically perform these steps; but it has been found that such expedients are generally complicated and involve considerable expense and inconvenience.

It is especially a serious problem to effect the aforesaid cutting and clamping steps in circular knitting machines where the rotating member is the cylinder. This type of machine is frequently preferred to the stationary cylinder type, since it eliminates the known disadvantages inherent in rotating yarn stands, the relatively high peripheral speeds of which produce uneven feeding. Such a machine, embodying a novel form of striping apparatus, is described in our patent application, filed June 26, 1948, Serial No. 35,376, now Patent No. 2,543,121. In this apparatus, we employ plurality of four-finger striping boxes, and certain novel actuating means therefor described in said application; and the arrangement is such that the inoperative yarn from the raised finger is wrapped around a central post—so that it becomes necessary periodically to remove the accumulations of wrapped-around yarn. It has been found that this may involve, under certain conditions, considerable loss of time and waste of material. And in the same type of machine, we have employed an arrangement of several cutting blades so disposed within the interior of the cylinder as to sever yarn operatively brought into their path. This arrangement has also been found, under certain conditions, to entail certain difficulties and uncertainty in the cutting of the yarn. It is accordingly within the contemplation of our invention to provide an apparatus, in conjunction with a striping device particularly although not necessarily like that shown in our said previous application, which will avoid the aforesaid shortcomings, yet which will effectively and conveniently hold the non-knitting yarn, and automatically cut the yarn the knitting of which has been discontinued.

More specifically, it is an object of our invention to provide a cutting and clamping device for striping mechanisms which will be adapted for

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positioning inside of the cylinder with respect to the needles, which can readily be connected to a multiple feed striping box, and which will be periodically operated by mechanism on the machine.

A further object is to provide a device of the said character capable of securely yet releasably holding in engagement a plurality of non-knitting strands of yarn of various sizes. And in this aspect of our invention, it is a further object to enable this function to be performed while one strand of yarn is in operative knitting position.

A further object of this invention is to provide a push member adapted to cooperate with a clamping member, whereby a yarn which has just been released from its knitting position will be brought within the clamping member without releasing the other strands being operatively held in place. And in this aspect of our invention, it is another object to enable the terminal of a selected non-knitting yarn to be operatively withdrawn from the clamping member to a knitting position.

It is still a further object of our invention to provide a retractable push member which upon retraction will not interfere with the clamping member nor with its strand holding function.

Still another object is to provide an adjustable clamping member which will not only be capable of simultaneously holding a plurality of strands, but which will automatically adjust itself during its engagement with the push member for maintaining its frictional grip upon the strands held therein.

And it is within the contemplation of our invention to enable the above-mentioned functions to be attained by a relatively simple and readily installed device.

Other objects, features and advantages will appear from the drawings and the description hereinafter given.

Referring to the drawings,

Figure 1 is a fragmentary plan view of a revolving cylinder knitting machine, showing a plan view of a striping box and a preferred form of yarn cutter and clamp in accordance with our invention—the pusher (only a fragment of which is shown) and its associated parts being shown in projected position.

Figure 2 is a section of Figure 1 taken substantially along line 2—2, and showing a side elevation of the striping box with a fragment removed for clarity, and the yarn cutter and clamp of Figure 1.

Figure 3 is a perspective view of the yarn pusher and a fragment of its actuator.

Figure 4 is a front view, taken from the inside of the cylinder, of the striping box and associated parts of Figure 1.

Figure 5 is a rear view of the apparatus of Figure 4, showing also the reciprocating pawl for operating the striper drum.

Figure 6 is a perspective view of the yarn clamp member, showing a portion of the yarn cutting blade.

Figure 7 is a fragmentary rear view of the two elements of the clamping member of Figure 6, showing such elements in pivotally displaced positions.

Figure 8 is a plan view substantially like Figure 1, but showing the pusher and associated parts in their operatively retracted position.

Figure 9 is a side elevation of Figure 8.

Figure 10 is a rear view of a portion of Figure 8.

Figure 11 is a perspective view of the pusher actuator and its cam.

Figure 12 is a section taken substantially along line 12—12 of Figure 9, showing the relative positions of the clamping member, the cutting knife, the retracted pusher, the yarn finger after it has been raised from its knitting position, three yarns held by the clamp, and the yarn extending from the finger to the fabric.

Figure 13 is a side view of Figure 12.

Figure 14 is a view like Figure 12, showing the pusher moving forwardly against the yarn, the three previously clamped yarns being omitted.

Figure 15 is a side view of Figure 14.

Figure 16 is a view like Figure 14, showing the pusher forcing the yarn between the two elements of the clamping member, and also showing said yarn being severed.

Figure 17 is a side view of Figure 16.

Figure 18 is a view substantially like Figure 17, but showing the pusher in its foremost position with the terminal portion of the yarn operatively engaged by the clamp.

Figure 19 is a view substantially like Figure 18, but showing the pusher being operatively retracted and riding over the clamping member.

Figure 20 is a section substantially like that of Figure 12, but taken along line 20—20 of Figure 21, and showing a modification of our invention containing an auxiliary yarn engaging arm, the pusher member and associated parts being in their fully retracted position.

Figure 21 is a side view of Figure 20.

Figure 22 is a rear view of the pusher member and associated auxiliary arm of Figure 21.

Figure 23 is a view substantially like Figure 20, the section being taken along line 23 of Figure 24, but showing the pusher member and auxiliary arm in engagement with the yarn—the said pusher member and arm being in the same relative position as shown in Figures 20 and 21.

Figure 24 is a side view of Figure 23.

Figure 25 is a view substantially like Figure 23, except that the pusher member is shown in a more forwardly position, whereby its relative position with respect to the auxiliary arm has been changed, this figure being a cross section along line 25 of Figure 26.

Figure 26 is a side view of Figure 25, and

Figure 27 is a perspective view of the pusher member and an auxiliary arm shown in Figures 20 to 26.

The apparatus illustrated, for purposes of example only, is the knitting machine and striping apparatus of our invention described in our

said patent application, Serial No. 35,376. The machine contains a stationary striping box carrier ring 20, and stationary sinker cam ring 21, a revoluble sinker dial 22, a revoluble cylinder 23, a plurality of reciprocating knitting needles 24, and radially movable sinkers 25, all in accordance with conventional structure. Mounted on stationary ring 20 are a plurality of stationary striping boxes 26, each containing four fingers or yarn carriers 27, 28, 29 and 30—said fingers being of conventional construction and containing apertures through which extend yarns 31, 32, 33, and 34 from cones on a stationary yarn stand. The yarn stand, knitting machine actuating mechanism, and the striping boxes other than the one illustrated, are omitted, since they are well-known to those skilled in the art—our said prior application describing certain of said parts in greater detail. Disposed below each said striping fingers is a needle latch guard 35 containing a yarn ledge 36, the wall 37 of the guard being engageable with the latch 38 of the needle (Figures 2 and 4).

The striping fingers are pivotally mounted and are each movable between an upper inoperative position and a lower operative or knitting position. In Figures 1 and 2, fingers 27, 28 and 30 are shown in an upper inoperative position and finger 29 in a lower operative position. When a selected finger is in its lower operative position, the yarn carried thereby, such as yarn 33, is disposed over and rests upon ledge 36 and is operatively engageable with the needle 24, whereby said yarn is knitted into the fabric. The three strands, 31, 32 and 34 (in their positions shown in Figures 1 and 2), extend into and are held between the elements 39 and 40 of the clamping member or clamp 41, to be hereinafter more fully described.

It is apparent that the movement of the striping fingers from their inoperative to their operative positions will determine which striping yarns are being incorporated in the fabric. Since the fingers may carry differently colored yarns, various fabric colors or striping effects can obviously be obtained by selectively operating one of the striping fingers of each of the striping boxes positioned about the machine.

The operating mechanism with the striping box is not, per se, the essence of this invention—although in the preferred form thereof illustrated, the operative movement of the striping box causes certain operative movements of the pusher and clamping members with which this invention is primarily concerned. The form of striping box here illustrated is similar to that shown in our pending application above-mentioned, and will not be described in all its details herein. Suffice it to say, for the purpose of this specification, that each striping box contains an inner rotating drum 42 mounted on shaft 43 (Figures 2, 5 and 9) operatively connected to a ratchet wheel 44, the teeth of which are in engagement with the pawl 45—said pawl being reciprocatingly actuated in accordance with a selective setting of a control mechanism which need not here be described, but which is clearly described in our said prior application, Serial No. 35,376. Each of the drums 42 contains on the cylindrical surface thereof a plurality of holes (not shown), in circumferentially spaced rows of four horizontally aligned holes—lugs or pins 46 being inserted in certain of these holes, in accordance with a predetermined design setting. The four circumferential rows of holes and the said pins 46 are disposed in underlying position with respect to

the corresponding fingers. More specifically, each of the fingers is pivotally mounted at 47, the undersurface of the rear arm 48 being adapted for slideable engagement with the tops of the underlying pins 46 or the drum surface. Each finger has associated therewith a spring 49 normally urging the finger upwardly into its inoperative position, in obvious manner. Thus, when the rear arm of a finger is not in engagement with a pin, it will rest upon the lateral cylindrical surface of the drum. However, as the drum moves in the direction of the arrow (Figure 2), the underlying pin 46a will cause an elevation of the rear arm of the overlying finger and a consequent depression of the forward part of the finger, whereby the finger is brought into its operative position, as indicated by finger 29 in Figures 1 and 2.

The said clamping member 41 consists of the two coacting elements 39 and 40, as aforesaid, the former being bifurcated and pivotally mounted on stem 50, the pivotal point being 51, said stem being affixed to frame 52 forming part of the bracket 53 fixedly attached to the lateral wall 54 of the drum housing 26 (Figures 2, 6 and 9). Element 39 contains a flat surface 55 engageable with cylindrical surface 56 of element 40—the latter being suspended from the stem 57 fixedly secured to sleeve 58 rotatably carried by bearing 59. Slidably disposed within frame 52 is the pin 60 urged outwardly by internal spring 61, so that the said pin is in yieldable engagement with the upper part of stem 57, whereby element 40 is maintained in pressing engagement with element 39 of the clamping member 41. Secured to stem 57 is the blade holder 62 to which is secured the blade 63. In the preferred form illustrated, holder 62 has a flat surface 64 in the same plane as the flat surface 65 of element 40, so that said blade is engageable with both of said surfaces, as clearly shown in Figures 7, 12 and 13. The rear part of pivotally mounted element 39 contains a rearwardly extending bar 66, to limit the upward movement of the cut yarn, as will more clearly hereinafter appear.

An important element of this invention is the push member 67 which is preferably of bell-crank form and contains a substantially horizontally disposed arm 68 to the terminal of which is pivotally mounted, at 69, the pusher blade 70 containing a downwardly extending arm 71 with a forward and substantially vertical pusher edge 72, the spring 73 mounted on the bell-crank arm 74 urging the blade 70 downwardly to a substantially vertical position determined by the stop 75. Arm 74 is pivotally mounted at 76 to the bracket 53, and is engageable with the stop 77 which limits the rearward movement of said arm 74 and consequently of the pushing blade attached thereto. The rear of arm 68 of the push member 67 is pivotally connected at 78 to the pusher actuator 79 containing a lateral extension 80, the under-surface of which contains a forwardly and upwardly extending inclined cam surface 81 and a rear stop surface 82. Said stop surface is engageable with the pin 83 (see Figures 1 and 2) attached to the control arm 84 pivotally mounted at 85 and yieldably urged upwardly by the spring 86 anchored to the wall 54 of the drum housing 26. The forward part of said arm 84 contains an upwardly extending finger 87 containing an inclined wall 88 slideably engageable with the pins 89 extending outwardly from the outer control knob or cylinder 90. There are as many pins 89 as there are horizontal rows of holes on the drum 42, as shown on our co-pending

application. The said finger 87 is preferably triangularly tipped and proportioned for entry into the spaces between adjacent pins 89, as clearly shown in Figure 2.

The rear of actuator bar 79 is connected at 91 to the terminal 92 of link 93, the opposite end 94 of said link being keyed on to shaft 95 the opposite terminal of which carries the follower arm 96. Spring 97 anchored at 98 engages arm 96 at 99, and yieldably urges it forwardly towards the center of the cylinder. Thus, normally said link 96 is in its foremost position shown in Figure 8, the terminal 100 of said arm being in engagement with the vertical wall 101 of the sinker dial 22. In this normal position, the link 93 is urged rearwardly in clockwise rotation, thereby carrying with it the actuator arm 79 and the push member 67 to the normal retracted position as shown in Figures 8, 9 and 12.

In the operation of this device, the position of the parts as shown in Figures 1 and 2 will first be considered. Here the fingers 27, 28 and 30 are, as aforesaid, in their raised positions so that their respective yarns 31, 32 and 34 are in non-knitting position. These yarns are shown held clamped between elements 39 and 40 of clamping member 41, the terminals being shown extending forwardly therefrom. The finger 29 is in its lower or knitting position, so that its yarn 33 rests upon ledge 36 (Figure 4) and is engageable with the needle 24 (Figure 2).

The push member 67 is in its forward position, as aforesaid, and the pin 83 is at the rear of stop surface 82 of actuator bar 79, thereby holding said actuator bar against rearward retraction; and in this position the finger 87 of control arm 84 is disposed between the two lowermost pins 89a and 89b on cylinder 90 (Fig. 2).

At a predetermined time, in accordance with the machine's control mechanism which has not herein been described but which may be like that shown in our said co-pending application, the pawl 45 is actuated upwardly (Figure 5) thereby causing an operative rotation of the drum 42 to which the outer cylinder 90 is operatively attached. As the cylinder 90 rotates in the direction of the arrow (Fig. 2), pin 89b will engage the surface 88 of finger 87 and urge the arm 84 downwardly against the action of spring 86, to the position shown in Figure 9—the arm 84 pivotally moving downwardly to lower pin 83 out of the path of actuator bar 79. Said bar will, therefore, under the urging of spring 97, move to its said rearmost retracted position, bar 79 sliding over said pin 83—the rearmost position being shown in Figures 8 and 9.

The rotation of the drum 42 has now caused finger 29 to be raised (by an underlying stud, in the manner described), and finger 34 to be lowered (by the removal of the underlying stud). By referring to Figures 8 and 9, it will be seen that yarn 33 is still attached to fabric 103, but now at a higher level, whereas the yarn 34 has now been lowered to the knitting position where it will be engaged by the needle 24—the terminal of said yarn 34 still being held within clamping member 41.

The machine is so timed that at this point, the cam 104 attached to the under side of the sinker dial 22 is brought into engagement with the follower arm 96, as shown in Figure 1. This causes a rearward movement of said follower 96 and a consequent forward movement of actuator 79 and push member 67, the inclined cam sur-

face 81 of actuator 79 riding over the pin 83. The action of this push member and associated parts will now be described by referring to Figures 12 to 19.

Finger 29, shown in Figure 12, has now been raised, and its yarn 33 is directly in the path of the pusher blade 72. As the push member 67 moves forwardly, it will engage the yarn 33 (Figures 14 and 15); and as member 67 continues its forward motion, it will enter between the elements 39 and 40 of the clamping member 41, carrying therewith a loop of the yarn 33. At the same time, the part of yarn 33 extending to the fabric 103 is engaged by the blade 53, and is severed thereby, as shown in Figure 16. This severing action is enhanced by the rotational movement of fabric 103. As the push member 67 continues its forward movement, it will reach its final projected position shown in Figure 18, at which point the severed terminal portion of yarn 33 will be held between the clamping elements of clamp 41. Since the movement of pusher blade 72 has been forwardly, it has not in any way affected the position of the other yarn strands held between the clamp.

It will be noted (Figure 19) that upon the return movement of push member 67 (after cam 104 has moved out of engagement with follower arm 95), the push blade 72 is pivotally actuated upwardly in clockwise direction, the rear edge 105 of the blade engaging the top of the clamping member 41 and riding rearwardly thereover. This action is rendered possible by virtue of the fact that the pressure between the two elements 39 and 40 of clamp 41 is sufficiently great to prevent an entry of blade 72 between the two elements. It is thus apparent that the return or retracting movement of the push member will in no way affect the yarns held within the clamp, whereas the blade would carry the yarns with it and out of the clamp, if it were compelled to move between the elements 39 and 40 upon its retraction.

It will further be observed, by referring to Figure 7, that when the pivotally mounted element 40 of the clamping member 41 is moved laterally, under the influence of the pusher blade, it is still maintained in pressing engagement against element 39, since said element is pivotally mounted at 51. Thus, there is always the equivalent of line contact between the cylindrical surface of element 40, the yarns engaged thereby and the flat surface 55 of element 39 to effectively hold the engaged yarn therebetween, even upon a displacement of element 40 of the clamp.

As the cylinder continues to rotate, the new yarn which is now being knitted, to wit, yarn 34 (due to the lowering of its finger 30), will be pulled outwardly from between the clamping elements 39 and 40 of the clamp 41. During this process, there is also a possibility that the filaments of the yarn will be fractured by the blade 53 as the yarn rubs thereagainst.

It will be noted that yarn 33 underlies the bar 66, which serves the purpose of preventing said yarn from rising to too high a level after its finger has been elevated and it is being subjected to the cutting and clamping operations.

In the modification of our invention illustrated in Figures 20 to 27, the pusher member 67a has pivotally mounted at the lateral side 107 thereof the auxiliary arm 108 containing an offset portion 109 to the end portion of which is a pivotally mounted terminal 110. Secured to the

rear of pusher member 67a is the spring 111, attached at 112 and containing a portion 113 engageable with the rear of arm 108, whereby the said arm is yieldably urged forwardly to a forward limiting position alongside of the pusher blade 70a. The said limiting position of the arm is determined by the stop 114 extending laterally from pusher member 67a and engageable with the finger 115 of the said auxiliary arm 108. The said terminal 110 contains a recessed portion 116 into which extends the stop 117 extending laterally from portion 109, said stop serving to limit the pivotal movement of terminal 110 in obvious manner.

In the operation of this modified form of our invention, the said auxiliary arm 109 moves forwardly with the operative forward movement of the pusher member 67a in the manner herein-above-described. During this motion, the forward edge 118 of terminal 110 engages the yarn 33a extending from a just raised striping finger to the fabric, in an operation similar to that shown in Figures 12 and 13. During the continued forward motion of the pusher member and auxiliary arm, the terminal 110 adjustably engages the element 39a of the releasable yarn clamp (similar to the yarn clamp herein-above-described) at the recessed portion 119 thereof. In this position, the yarn 33a is now firmly held by terminal 110 in pressing engagement with the said clamp element 39a, the yarn being embedded within recess 119 as a result of the pressure exerted by spring 111. The continued operative forward movement of pusher member 67a is not interfered with by this operation, since such forward movement will merely result in a relative pivotal movement of auxiliary arm 108 against the action of spring 111.

It is thus obvious that the yarn 33a will be firmly and frictionally held against movement or displacement when the terminal 110 is in pressing engagement with said yarn and element 39a. It has been found that this arrangement assures a cutting of yarn 33a by blade 63a, without any slippage thereover. In other words, even if the blade should become somewhat dulled because of long use, it will still be effective in cutting the yarn 33a when it is held in tensioned position thereover, since the yarn will not slip along the edge of the blade.

It is also apparent that the arrangement of the modified form above-described does not in any way interfere either with the forward or retractive operative movements of pusher member 67a. The forward movement of the pusher member continues without interruption because of the pivotal mounting of the auxiliary arm; and the return movement of the pusher member will merely cause the auxiliary arm to be carried rearwardly thereby.

It is thus apparent that by means of the novel pusher and clamping elements above-described, in combination with their associated parts, yarn can be operatively brought in and out of their knitting positions, and cut and clamped for best operative results with a minimum of effort and with no waste whatsoever.

In the above description, the invention has been disclosed merely by way of example and in preferred manner; but obviously many variations and modifications may be made therein which will still be comprised within its spirit. It is to be understood, therefore, that the invention is not limited to any specific form or manner of prac-

ting same, except insofar as such limitations are specified in the appended claims.

We claim:

1. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp with separable elements for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp between the separable elements thereof, whereby the yarn carried by said member will be brought into operative engagement with the clamp.

2. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp comprising two separable elements in yieldable pressing engagement for releasably holding therebetween the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being movable between said elements, whereby the yarn carried by said member will be brought between said elements for frictional engagement thereby.

3. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp comprising two separable elements in yieldable pressing engagement for releasably holding therebetween the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being movable between and forwardly beyond said elements, whereby the yarn carried by said member will be brought between said elements for frictional engagement thereby, the retracting path of said pusher member towards its said retracted limiting position being in non-intersecting relation to the contacting portions of said separable elements, whereby said elements will not be separated by the pusher member upon its operative retraction.

4. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between an upper non-knitting position and a lower knitting position, the combination of a releasable yarn clamp with separable elements for holding the yarns operatively extending from said feeding unit, a pusher member movable between a retracted limiting position behind the said yarns extending from the feeding

unit to a projected limiting position forwardly thereof, the operative path of the member from said retracted to said projected position being substantially at said lower knitting position and intersecting the path of knitting yarn extending from said unit, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp between the separable elements thereof, whereby the yarn carried by said member will be brought into operative engagement with the clamp.

5. In a circular knitting machine of the type containing a needle cylinder and a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp for holding the yarns operatively extending from said feeding unit, said clamp being disposed inwardly with respect to the periphery of the cylinder, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp, whereby the yarn carried by said member will be brought into operative engagement with the clamp; further provided with a cutting blade disposed above the cylinder and adjacent to the yarn clamp, the blade being positioned in the path of the said last mentioned yarn operatively extending from the clamp to the fabric being knitted.

6. In a circular knitting machine of the type containing a needle cylinder and a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp for holding the yarns operatively extending from said feeding unit, said clamp being disposed inwardly with respect to the periphery of the cylinder, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp, whereby the yarn carried by said member will be brought into operative engagement with the clamp; and cam means operatively associated with the machine and connected with said pusher member, for actuating said member during the operative rotation of the machine.

7. In a circular knitting machine of the type containing a rotary pin drum multiple feed striping unit intermittently operated by selective actuating means, the combination of a releasable yarn clamp for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pushed member being engageable with the clamp, whereby the yarn carried by said member will be brought into operative engagement with the

clamp; and retractable stop means for holding said pusher member against retraction from its said projected limiting position, said stop means being coactively connected to and actuated by the said rotary pin drum of the machine.

8. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 7, further provided with a cylinder connected to the rotary pin drum of the machine and rotatable therewith, a plurality of pins circumferentially disposed about the cylinder, the said retractable stop means comprising a spring loaded pivotally mounted control arm having a finger with an inclined surface engageable with successive pins on the cylinder, said control arm being yieldably urged towards the cylinder whereby said finger will extend between adjacent pins and whereby an operative rotation of the cylinder will cause the arm to be retracted by the engagement of said inclined surface with the operatively adjacent pin; said control arm having a laterally extending pin positioned for holding the pusher member against retraction when the control arm is in any position other than its said retracted position.

9. In a circular knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp, whereby the yarn carried by said member will be brought into operative engagement with the clamp; a rotating cam; and a follower arm engageable by said cam and operatively connected to said pusher member.

10. In a knitting machine, the combination according to claim 9, further provided with a rotatable sinker dial, said cam being mounted on said dial.

11. In a knitting machine, the combination according to claim 9, the pusher member being normally yieldably urged into its said retracted position.

12. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp with separable elements for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp between the separable elements thereof, whereby the yarn carried by said member will be brought into operative engagement with the clamp, further provided with an actuator bar pivotally connected to a rear portion of the pusher member, a rotatable member on the machine, and a link operatively con-

necting said rotatable member and said actuator bar.

13. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp with separable elements for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp between the separable elements thereof, whereby the yarn carried by said member will be brought into operative engagement with the clamp, further provided with an actuator bar pivotally connected to a rear portion of the pusher member, a forwardly and upwardly extending inclined cam surface on the actuator bar, a rear stop surface on said bar, and retractable stop means for holding said pusher member against retraction from its said projected limiting position, said stop means comprising a pivotally mounted control arm having a laterally extending pin in the path of said stop surface and engageable therewith when the arm is in a predetermined projected position, and engageable with said inclined cam surface when the arm is in its operative retracted position, whereby the actuator bar and associated pusher member will be free for forward movement.

14. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 2, one of said elements being rotatable about an axis extending substantially horizontally through the body thereof, the other of said elements being movable from the first-mentioned of said elements in a direction substantially normal to the said axis.

15. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 2, one of said elements being cylindrical and the other having a substantially flat surface in engagement with the cylindrical surface of the other.

16. A clamping member for releasably holding knitting and non-knitting yarns extending from a striping yarn feeding unit, comprising two separable elements in yieldable pressing engagement, a stationary stem on which one of said elements is mounted, and a rotatably mounted stem on which the other of said elements is mounted, one of said elements being pivotally supported about an axis extending through the body thereof and substantially parallel to the axis of rotation of said rotatably mounted stem.

17. A clamping member according to claim 16, the pivotally supported element being mounted on the stationary stem.

18. A clamping member according to claim 17, one of said elements being cylindrical and the other having a substantially flat surface in engagement with the cylindrical surface of the other.

19. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a

knitting position, the combination according to claim 2, further provided with a bar attached to one of said elements intermediate the upper and lower ends thereof, for limiting the position of the yarns operatively held by the clamp.

20. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being yieldably engageable with the clamp, whereby the yarn carried by said member will be brought into operative engagement with the clamp; further provided with a cutting blade positioned in the path of the said knitting yarn operatively extending from the clamp to the fabric being knitted, said cutting blade being in engagement with said clamp.

21. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 1, the pusher member being pivotally mounted and having at the forward portion thereof a pusher blade.

22. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 2, the pusher member being pivotally mounted and having at the forward portion thereof a pusher blade, further provided with a stop member engageable with the pusher member to limit its rearward movement to said retracted position.

23. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination of a releasable yarn clamp with separable elements for holding the yarns operatively extending from said feeding unit, a pusher member movable between retracted and projected limiting positions, the operative path of the member between said positions intersecting the path of yarn extending from said unit at the said knitting position, whereby the pusher member will during its forward movement engage and carry forwardly a yarn in its said path, said pusher member being engageable with the clamp between the separable elements thereof, whereby the yarn carried by said member will be brought into operative engagement with the clamp, the pusher member being pivotally mounted and having at the forward portion thereof a pusher blade, the pusher member being of bell-crank configuration pivotally mounted at one end and having at the other end the pusher blade, further provided with an actuator bar pivotally attached to the rear portion of the pusher member, a rotatable member on the machine, and a link operatively connecting said rotatable member and said actuator bar.

24. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and knitting position, the combination according to claim

2, the pusher member having at the forward portion thereof a pusher blade pivotally mounted for movement between a substantially vertical operative position to an inoperative position at an angle to the said operative position, said blade being engageable with the said yarn in the pusher member's path during the pusher member's said forward movement, said blade being movable between and past said two elements of the clamp during said forward movement, when the blade is in its said operative position, and being slidably movable over said two elements in its said inoperative position during the pusher member's retractive movement.

25. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 24, the blade being normally yieldably held in its said operative position.

26. In a pusher member for pushing yarn into a yarn holder of the class described, a supporting arm, a pusher blade having a blade arm and being pivotally mounted on the forward portion of said supporting arm and being movable between two limiting positions in one of which the blade arm is substantially vertical, stop means for limiting the movement of said blade to said two positions, and a spring normally holding the blade with its said blade arm in said substantially vertical position.

27. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 2, the pusher member having mounted at a lateral side thereof an auxiliary arm engageable with the said yarn carried forwardly by the pusher member during its said forward movement, said auxiliary arm being engageable with the adjacent one of said two yarn clamp elements during said forward movement of the pusher member, whereby the said yarn will be frictionally held by said arm against said element.

28. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 27, said auxiliary arm being pivotally mounted on the pusher member and yieldably urged forwardly.

29. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 2, the pusher member having mounted at a lateral side thereof an auxiliary arm having a pivotally mounted terminal engageable with the said yarn carried forwardly by the pusher member during its said forward movement, said terminal being engageable with the adjacent one of said two yarn clamp elements during said forward movement of the pusher member, whereby the said yarn will be frictionally held by said terminal against said element, said auxiliary arm being pivotally mounted on the pusher member and yieldably urged forwardly.

30. In a knitting machine of the type containing a striping yarn feeding unit for moving selected yarns between a non-knitting and a knitting position, the combination according to claim 2, the pusher member having mounted at a lateral side thereof an auxiliary arm engageable with the said yarn carried forwardly by the

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pusher member during its said forward movement, said auxiliary arm being engageable with the adjacent one of said two yarn clamp elements during said forward movement of the pusher member, whereby the said yarn will be frictionally held by said arm against said element, the said engaged yarn clamp element having a recessed portion with which said auxiliary arm is engageable.

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