Oct. 31, 1961 S. J. HADDAD 3,006,174

PATTERN DEVICE WITH MOVABLE BUTTS

Filed Jan. 6, 1958 3 Sheets-Sheet 1

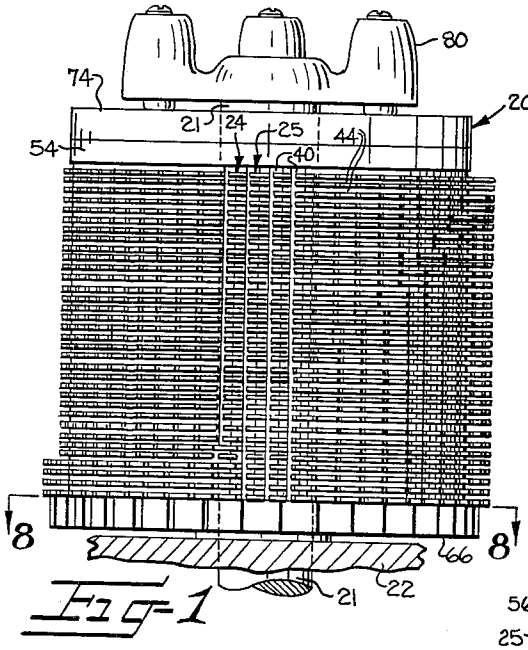


Fig-1

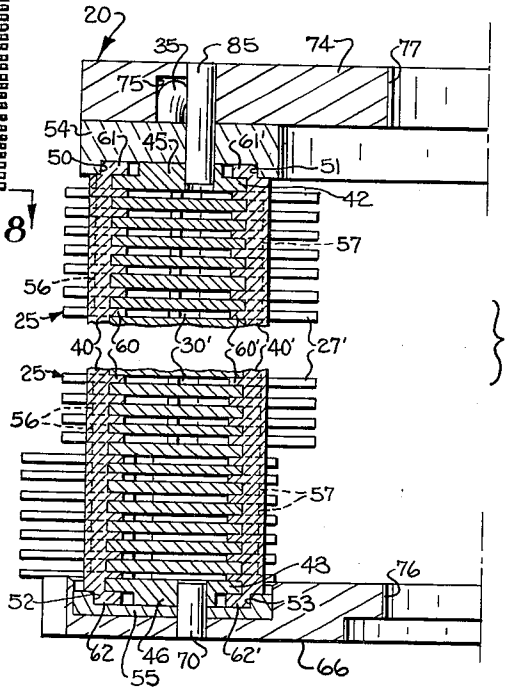


Fig-3

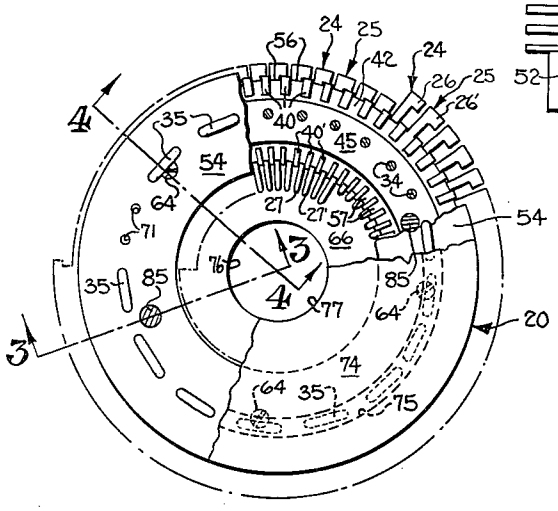


Fig-2

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Oct. 31, 1961 S. J. HADDAD 3,006,174

PATTERN DEVICE WITH MOVABLE BUTTS

Filed Jan. 6, 1958 3 Sheets-Sheet 2

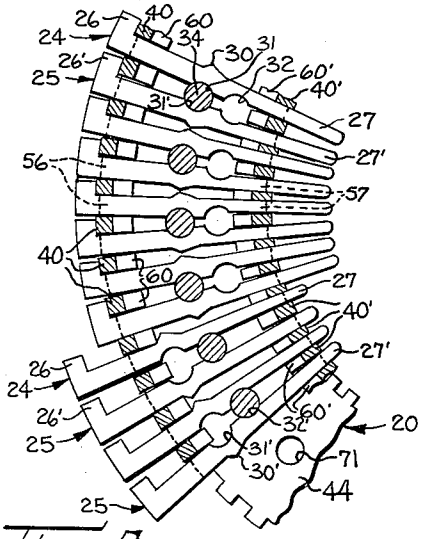


Fig-5

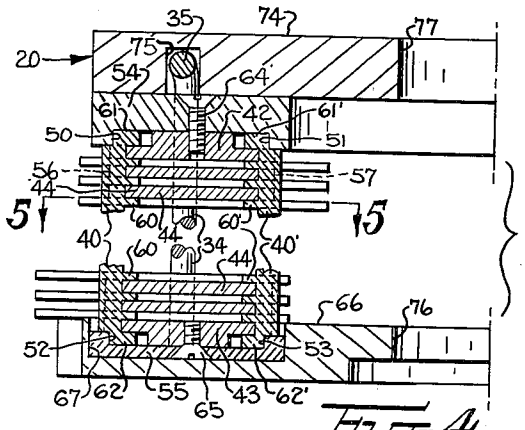


Fig-4

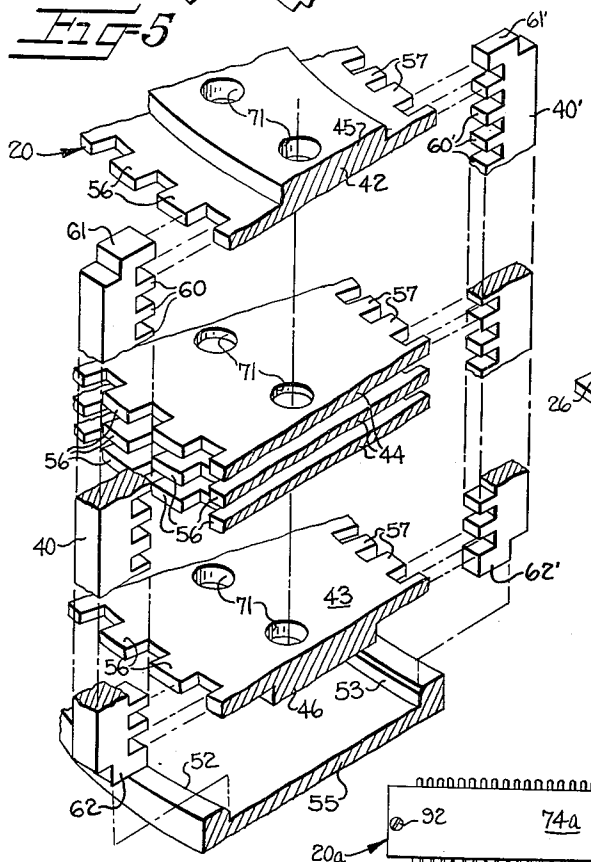


Fig-6

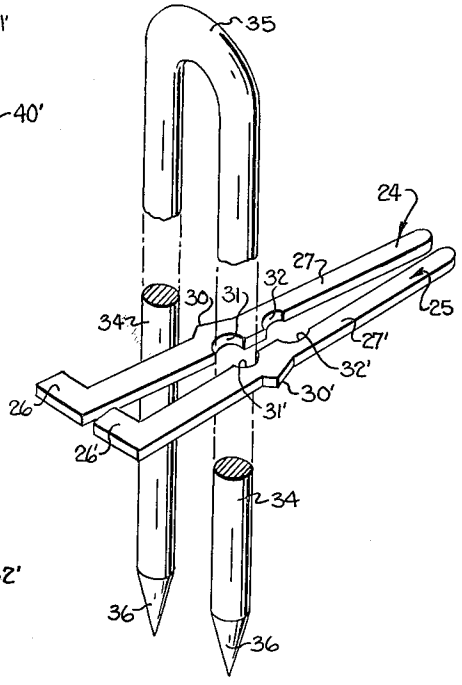


Fig-7

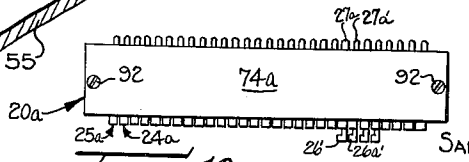


Fig-10

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Oct. 31, 1961 S. J. HADDAD 3,006,174

PATTERN DEVICE WITH MOVABLE BUTTS

Filed Jan. 6, 1958 3 Sheets-Sheet 3

Fig-8

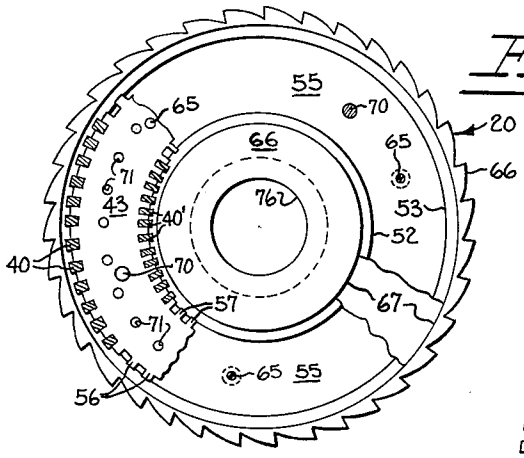


Fig-9

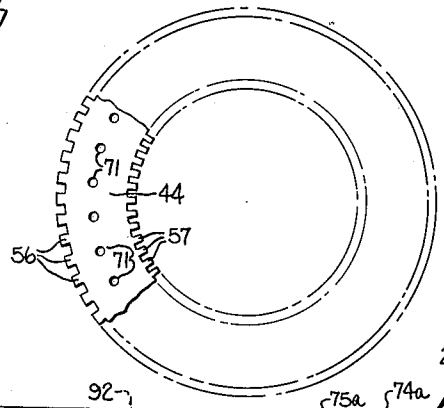
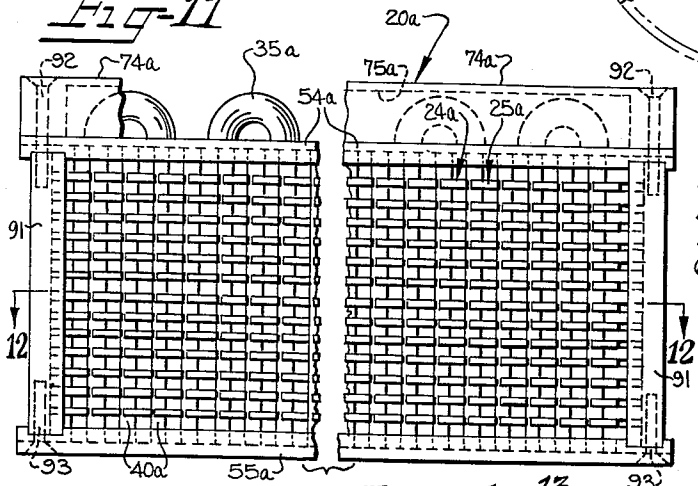


Fig-11



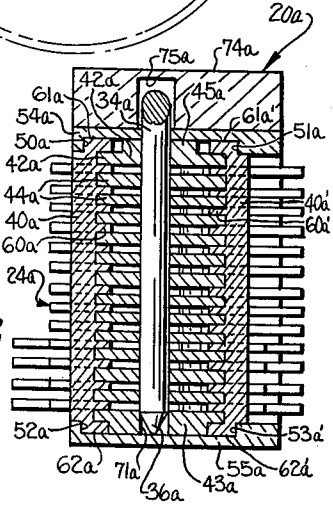


Fig-13

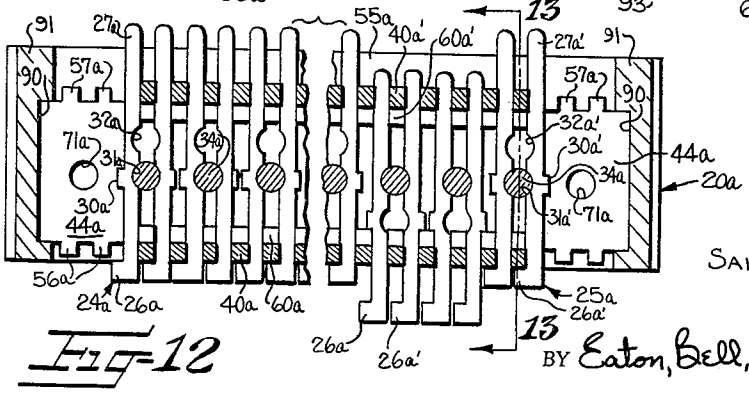


Fig-12

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United States Patent Office

3,006,174
Patented Oct. 31, 1961

3,006,174

PATTERN DEVICE WITH MOVABLE BUTTS

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Filed Jan. 6, 1958, Ser. No. 707,293
Claims priority, application Brazil Jan. 7, 1957
8 Claims. (Cl. 66—156)

This invention relates to pattern devices, such as pattern drums adaptable for use on knitting machines and the like in which levers or plungers are selectively operated in accordance with projections on the pattern device. Devices with which the present invention is concerned may be in the form of flat body members, curved body members or circular body members such as pattern drums, trick wheels and the like such as are used on circular knitting machines.

In such pattern devices presently in use, the pattern is produced by stacking a number of flat pattern plates, disks or rings and flat spacer plates in alternation, which are suitably secured together. For example, the usual type of pattern drum used on knitting machines include a number of flat pattern disks or rings and flat spacer rings stacked in alternation around a cylindrical drum which serves as a supporting mandrel. Such flat pattern plates or disks are provided with outwardly or radially projecting frangible pattern elements or butts and, by selectively removing a number of the frangible pattern elements in accordance with particular pattern requirements, the desired pattern will be achieved upon finally assembling the pattern plates and spacer plates in a predetermined order on the body or drum mandrel.

The removal of selected frangible pattern elements on the pattern plates or disks is time consuming and expensive, not withstanding the fact that the pattern plates or disks cannot normally be re-used when the patterning is revised.

Various attempts have been made to provide a pattern device having changeable pattern elements wherein each pattern element could be removed from the supporting mandrel or body of the pattern device independently of the others. In some instances, removable pattern butts or elements having different lengths have been used. However, the removal and/or replacement of pattern elements in modifying pattern changes in a pattern device is also time consuming and expensive.

It is therefore, an object of this invention to provide a pattern device comprising pattern elements which are movable inwardly and outwardly relative to the body or drum supporting the same without removing the pattern elements from the body or drum so the pattern elements may be selectively positioned relative to the body or drum in accordance with particular pattern requirements, thus facilitating alteration or revision of the pattern without dismantling the pattern device to any material extent.

It is another more specific object of this invention to provide a pattern device in the form of a flat body or a circular drum in which the pattern face comprises closely spaced rows or vertical columns of selectively inwardly and outwardly movable pattern elements and in which the pattern elements may be moved in either direction individually so that selected pattern elements may project outwardly from the body of the pattern device a greater distance than others, and wherein means are provided for retaining the pattern elements in the desired position.

Some of the objects of the invention having been stated, other objects will appear as the description proceeds when taken in connection with the accompanying drawings, in which—

FIGURE 1 is a side elevation of one form of the improved pattern device embodied in a knitting machine pattern drum;

FIGURE 2 is a top plan view of the pattern drum shown in FIGURE 1, omitting the friction device and showing various parts broken away for purposes of clarity;

FIGURE 3 is an enlarged fragmentary vertical sectional view through the device taken substantially along line 3—3 in FIGURE 2;

FIGURE 4 is a view similar to FIGURE 3, but being taken substantially along line 4—4 in FIGURE 2;

FIGURE 5 is a fragmentary plan view, partially in section, taken substantially along line 5—5 in FIGURE 4 showing some of the pattern elements in outward or active position with others of the pattern elements in inward or inactive position;

FIGURE 6 is an enlarged fragmentary, exploded isometric view of the structure shown in FIGURE 3, omitting the top and bottom supporting members and corresponding pattern elements;

FIGURE 7 is a fragmentary isometric view illustrating two of the pattern elements and the corresponding locking keys therefor removed from the pattern drum, with portions of the keys broken away;

FIGURE 8 is a sectional plan view taken substantially along line 8—8 in FIGURE 1, but omitting many of the pattern elements and intervening separator elements therefrom;

FIGURE 9 is a plan view of one of the pattern-element-guiding partitions or plates removed from the pattern device, with portions broken away and in phantom lines;

FIGURE 10 (Sheet 2) is a plan view of another embodiment of the invention in which the pattern device is generally in the form of an elongated rectangular body;

FIGURE 11 is an enlarged fragmentary front elevation of the form of the invention shown in FIGURE 10.

FIGURE 12 is a fragmentary sectional plan view taken substantially along line 12—12 in FIGURE 11;

FIGURE 13 is a transverse vertical sectional view taken substantially along line 13—13 in FIGURE 12.

Pattern devices embodying the principles of the present invention may be used for determining the patterns on various types of machines, such as full-fashioned hosiery knitting machines, jacquard looms, dobby looms, slubbing attachments for spinning frames, flat bed knitting machines, jacquard knitting machines, circular knitting machines, and the like. Also, the over-all configuration of the pattern device may vary according to its particular requirements. The first form of the invention is embodied in a pattern drum of the type used on circular knitting machines and the second embodiment of the invention shown in FIGURES 10, 11, 12 and 13 is embodied in an elongated substantially rectangular assembly which illustrates one of many different forms in which the improved pattern device may be constructed.

The first form of the invention shown in FIGURES 1 through 9 and embodied in a knitting machine pattern drum will now be described.

Referring more specifically to the drawings, the first form of the pattern device is in the form of a cylindrical body, pattern drum or pattern element carrier broadly designated at 20 which is adapted to be rotatably mounted on a post or shaft 21 carried by a support 22, such as the frame of a conventional circular knitting machine. The pattern drum 20 is of generally hollow construction to facilitate inserting one's fingers therein for engaging and moving outwardly novel pattern elements, of which two types are shown in the present instance broadly designated at 24 and 25. In this instance, the pattern elements 24, 25 are arranged horizontally in alternation and are also arranged in vertical columns. Each of the pattern elements 24, 25 is in the form of a rigid, relatively thin substantially L-shaped member and it is con-

templated that all the pattern elements 24, 25 may be identical. However, in the interest of compactness, the pattern elements 24, 25 are constructed similarly, but opposite hand to each other and therefore the parts of the pattern element 25 which are similar to corresponding parts of the pattern element 24 will bear like reference characters with the prime notation added. The L-shaped pattern members 24 and 25 form respective butt ends or operating ends 26 and 26' and elongated stems or shanks 27 and 27'.

As best shown in FIGURES 5 and 7, corresponding side edges of the stem 27 of each of the pattern elements 24 is provided with a projection or stop element 30 which extends in the same directions as the corresponding butt portion 26 with respect to the shank 27. On the other hand, corresponding side edges of the shanks 27' are provided with a projection or stop element 30' which extends from the edge of the stem 27' opposite from the direction of the butt portion 26'. Also, it will be observed, in FIGURE 7, that the butt portion 26' on the stem 27' of each pattern element 25 projects from the opposite side of the stem 27' with respect to the corresponding butt portions 26 on the stem 27 of each pattern element 24.

The edges of the stems 27, 27' of the pattern elements 24, 25 opposite from the respective stop elements 30, 30' are provided with respective pairs of longitudinally spaced key slots 31, 32 and 31', 32' therein which are so spaced with respect to each other and relative to the respective butt portions 26, 26' that the key slots 31, 31' of adjacent horizontally spaced pattern elements 24, 25 coincide with each other when the pattern elements occupy inward or inactive position in which those elements in the upper portion of FIGURE 5 are shown as well as the pattern elements 24, 25 in FIGURE 7, to thereby accommodate an elongated locking element or key 34 for maintaining the latter pattern elements in the desired inward position. It will be noted that the keys 34 are, in this instance, made in pairs, with each pair of keys 34 being interconnected at its upper end by a bridging portion 35. The lower end of each key 34 is preferably tapered, rounded or pointed, as at 36, to facilitate insertion thereof in the drum as will be more fully described hereinafter.

As best shown in the lower portion of FIGURE 5 and in FIGURE 7, it will be noted that the key slots 32, 32' in the stems 27, 27' of adjacent pattern elements 24, 25 also coincide with each other and the outer ends of the respective butt portions 26, 26' are disposed flush with each other so that, when the pattern elements 24, 25 occupy an outward or active position, as shown in the lower portion of FIGURE 5, the corresponding key 34 engages the adjacent key slots 32, 32' to lock the latter pattern elements 24, 25 in outward or active position. It should be further noted that, upon either of the adjacent pattern elements occupying inward position relative to the other, such as the pattern elements 24 and 25 in FIGURE 7, the key slots 31 and 32' may occupy coinciding relationship or the key slots 31', 32 may occupy coinciding relationship, depending upon which of the two pattern elements shown in FIGURE 7 occupies inward position with respect to the other, thus insuring that adjacent pattern elements may be locked in the desired inward or outward position and thereby permitting infinite pattern mutations without removing the pattern elements from the drum in which they are mounted for radial or inward and outward adjustment.

Although the cylindrical pattern drum or pattern element carrier 20 may be constructed in various ways, without departing from the spirit of the invention, a preferred embodiment of construction will now be described. In order to form slots in which the pattern elements 24, 25 are mounted for individual inward and outward adjustment or displacement while maintaining them in accurately spaced horizontal and vertical relationship, the pattern drum or pattern element carrier 20 is preferably of composite structure with its outer wall being formed by a plurality of circularly spaced outer spacer elements or bars 40 and with its inner wall being formed by a plurality of circularly spaced inner spacer elements or bars 40', the outer and inner spacer elements or bars 40, 40' being disposed vertically in respective spaced and coinciding relationship so as to define slots therebetween through which the inner and outer portions of the stems or shanks 27, 27' of corresponding pattern elements 24, 25 extend. It is particularly important to note that the stems 27, 27' of the pattern elements 24, 25 are substantially longer than the distance from the outer surface of each outer spacer element 40 to the inner surface of each inner spacer element 40' so that the inner ends of the stems 27, 27' of the pattern elements 24, 25 project inwardly of the inner wall of the pattern element carrier 20 when it is assembled as shown in FIGURES 2, 3, 4 and 5.

The pattern elements 24, 25 are thus maintained in proper circularly spaced or horizontally spaced relationship by the outer and inner spacer elements 40, 40'. In order to support the pattern elements 24, 25 in accurate vertically spaced relationship, there is provided a plurality of vertically spaced guide plates which are shown in the form of rings in FIGURES 2, 5, 6, 8 and 9, the outer or upper and lower rings or guide plates being indicated at 42 and 43, respectively, and the intervening or intermediate plates therebetween each being indicated at 44. The plates 44 are relatively thin and are preferably of the same thickness throughout their width while the plates 42 and 43 are preferably provided with respective thickened portions or relatively broad projections 45 and 46 on the outer or distal surfaces thereof which loosely fit between inwardly projecting key portions 50, 51 and 52, 53 on respective retaining members or plates 54, 55 which retain all of the outer and inner spacer elements 40, 40' and the vertically spaced guide plates 42, 43 and 44 in assembled position, as will be presently described.

The outer and inner edges of the guide plates 42, 43 and 44 are provided with coinciding longitudinally spaced or circularly spaced projections or lugs 56, 57 thereon, respectively, between adjacent pairs of which the respective spacer bars 40 and 40' are adapted to snugly fit, so the projections or lugs 56 maintain the outer spacer elements or bars 40 in accurately spaced relationship while the projections or lugs 57 on the inner edges of the guide plates 42, 43 and 44 maintain the inner spacer elements or bars 40' in accurately spaced relationship. The outer and inner spacer elements 40, 40' are also provided with respective tooth-like projections 60, 60' on the proximal edges thereof, adjacent pairs of which straddle the respective guide plates. The outer and inner spacer elements 40, 40' are positioned between adjacent lugs 56, 57, to thereby also maintain the guide plates 42, 43 and 44 in accurate vertically spaced relationship.

Now, it will be noted that the upper and lower ends of the outer and inner spacer elements 40, 40' are each cut away at their outer edges to form respective retaining projections 61, 62 and 61', 62' on the upper and lower ends of the outer and inner spacer elements or bars 40, 40' which, as best shown in FIGURES 3 and 4, are adapted to fit against the inner surfaces of the respective retaining projections 50, 52 and 51, 53 on the proximal surfaces of the retaining plates or members 54, 55, to thereby retain the spacer elements 40, 40' in engagement with the guide plates 42, 43 and 44.

With the parts thus assembled, the outer guide plates 42, 43 may be suitably secured to the retaining members 54, 55, as by respective screws 64, 65 (FIGURE 4). During assembly of the guide plates 42, 43 and 44 and the spacer elements 40, 40' in substantially the manner described, the stems 27, 27' of the pattern elements 24, 25 are positioned between the plates 42, 43 and 44 and the corresponding spacer bars 40, 40', substantially as shown

in FIGURES 1 through 5. Thus, the stems of the pattern elements are positioned for radial sliding movement in slots defined by the guide plates 42, 43 and 44 and the spacer elements 40, 40'.

Since the pattern element carrier 20 is in the form of a cylindrical drum, it is preferred that the inner spacer elements 40' are of lesser thickness than the outer spacer elements 40, and that the inner ends of the shanks 27, 27' of the respective pattern elements 24, 25 are of lesser width than the outer ends thereof, with the exception of the irregularities formed thereon by the butts 26, 26', the stop projections 30, 30' and the key slots 31, 31', 32 and 32'. The inner ends of the shanks 27, 27' on the pattern elements 24, 25 are also preferably rounded or have any rough edges removed therefrom so they may be engaged by one's fingers for moving the same outwardly.

After the parts have been assembled in the manner described, it may be desirable to position the lower retaining member or plate 55 on a base 66 which, in this instance, is shown in the form of a ratchet wheel or gear. In this instance, the base 66 is provided with an annular groove 67 in its upper surface and in which the lower retaining member 55 is loosely fitted. In order to insure proper relationship between the teeth in the ratchet wheel 66 and the pattern elements and to also facilitate ease in assembly, the base or ratchet wheel 66 is provided with a plurality of spaced locating elements or pins 70 which project upwardly in the bottom of the annular groove 67 and loosely penetrate the bottom retaining member 55 and the bottom guide plate 43 (FIGURES 3 and 8).

As best shown in FIGURES 2 and 6, the guide plates 42, 43, 44 and the upper retaining member 54 are provided with coinciding holes 71 therein which are circularly spaced for receiving the respective keys 34. The keys 34 are positioned in alinement between the respective outer and inner spacer bars 40, 40' so as to fit in the key slots 30, 31, 31' ajnd 32' in the manner heretofore described, depending upon the relative position of adjacent pattern elements 24, 25. One of the pairs of interconnected keys 34 is omitted from the left-hand portion of FIGURE 2 to illustrate the corresponding holes 71 in the upper retaining member 54.

Now, although the rounded or pointed lower ends 36 of the keys 34 will assist in alining the key slots in adjacent pattern elements therewith as the keys 34 are being inserted in the holes 71, it will be noted that, when the inner surfaces of any of the butts 26, 26' are in engagement with the outer surface of corresponding outer spacer elements 40, the key slots 31, 31' thereof are accurately alined with the respective holes 71 in the guide plates 42, 43, 44 and the upper retaining member 54. On the other hand, when any of the pattern elements 24 or 25 occupy outward or active position as shown in the lower portion of FIGURE 5, the corresponding stop projections 30, 30' engage the inner surfaces of corresponding teeth 60 on the corresponding outer spacer bar 40. In so doing, the stop projections 30, 30' insure that the corresponding inner key slots 32, 32' are then in alinement with the respective holes 71.

It is thus seen that, in order to alter or revise the pattern, it is simply necessary to remove or partially remove corresponding keys 34 so that desired pattern elements 24 and/or 25 may be moved inwardly or outwardly, as the case may be, whereupon the previously removed or partially removed keys 34 may then be reinserted in the corresponding holes 71 to serve as a locking means for retaining the pattern elements in the desired position. It is contemplated that additional key slots may be provided in the shanks 27, 27' of the pattern elements 24, 25 in the event that it is desired that the pattern elements are capable of adjustment to more than two different positions, without departing from the spirit of the invention.

After the desired pattern mutations have been made, a cap, upper end plate or disk 74 may be positioned against the outer or upper surface of the upper retaining member 54, the lower surface of the cap 74 preferably being suitably grooved, as at 75, to accommodate the bridging portions 35 on adjacent pairs of keys 34.

The base 66 and the cap 74 may be provided with corresponding axially alined bores or holes 76, 77 (FIGURE 4) for mounting the pattern drum or pattern element carrier 20 on the shaft 21. The upper end of the shaft 21 may be provided with a suitable friction device 80 thereon, such as is generally used on knitting machines, for engaging the upper surface of the cap or end plate 74 to prevent inadvertent rotation of the pattern drum 20, as is well known. The cap 74 may be maintained in engagement with the upper retaining member 54 by any suitable means and, in this instance, a plurality of pins 85 are provided in the end member or cap 74, which loosely penetrate the upper retaining member 54 and partially loosely penetrate the upper spacing or guide plate 42, as best shown in FIGURES 2 and 3.

Although the base 66 and cap 74 are shown as independent elements, it is apparnet that they may be integral with the respective retaining members 55, 54 or, as a matter of fact, the retaining member 55 may be of lesser internal diameter than that shown so as to fit on the post 21. In the latter instance, it is apparent that the cap 74 may be omitted. The cap 74 also provides a shield for the upper bridging portions 35 of the keys 34.

In setting up an original pattern, the pattern drum 20 is normally removed from the post 21, the cap 74 and all the keys 34 removed and then all of the inner ends of the stems 27, 27' of all the patterned elements 24, 25 pushed outwardly, as by one's finger, to move all of the pattern elements 24, 25 outwardly to active position. Alternatively, the friction device 80 may be removed from post 21 and the entire pattern drum 20 (with the exception of the ratchet wheel or base 66) lifted off the post 21 so as to provide for easy access to the inner ends of the pattern elements 24, 25 through the ring retainer member 55. The operator or mechanic then merely pushes the butts 26, 26' of any desired patterned elements 24, 25 inwardly to inactive position, leaving the remaining pattern elements in active position, to form the desired pattern on the outer face of the pattern drum 20. Any relatively small-ended instrument may be used by the operator for engaging the ends of the butts 26, 26' for this purpose. Thereupon, the keys 34 are inserted in the holes 71 in the upper retaining plates 54 and the guide plates 42, 43 and 44 for locking all the pattern elements in the position to which they have been adjusted. The cap 74 is then positioned upon the upper retaining member 54 in the manner described, the pattern drum 20 replaced on the shaft 21 and the pattern drum 20 is then ready for operation. As heretofore stated, if it so happens that only one or a relatively few of the pattern elements need be adjusted, it is only necessary to remove corresponding keys from engagement with the pattern elements to be adjusted, make the necessary adjustments, and then reinsert the keys.

Modified form of pattern device

It has already been stated that the pattern device embodying the principles of the present invention may vary in its over-all configuration according to the purpose for which it is used. In FIGURES 10, 11 and 12, a modified form of pattern device embodying the principles of the present invention is illustrated, which is of generally rectangular construction and, since many of the parts of the form of the invention shown in FIGURES 10, 11, 12 and 13 are quite similar to corresponding parts of the first form of the invention shown in FIGURES 1 through 9, like reference character will apply to such similar parts with the small letter "*a*" added thereto, where applicable.

It will be observed in FIGURES 10 through 13 that the modified form of pattern device comprises pattern elements **24***a*, **25***a* which are substantially the same as the pattern elements **24**, **25** of the first form of the invention, with the primary exception that the stems or shanks **27***a*, **27***a'* thereof need not be of lesser width at the inner ends thereof than they are adjacent the respective butts **26***a*, **26***a'* thereof. Accordingly, a further detailed description of the pattern elements **24***a*, **25***a* will not be given. The keys **34***a* may be identical to the keys **34**, although the lower portions thereof need not penetrate the lower retaining member **55***a*. The vertical outer and inner spacer elements or bars **40***a*, **40***a'* may be identical to the respective spacer elements **40**, **40'** of FIGURE 6. However, it will be observed in FIGURE **12** that the outer and inner spacer elements **40***a*, **40***a'* may be identical rather than differing in relative thickness.

Since the horizontal guide plates **42***a*, **43***a* and **44***a*, the upper and lower retaining members **54***a*, **55***a* and the cap **74***a* are also of substantially the same construction as the corresponding elements **42**, **43**, **44**, **54**, **55** and **74** of the first form of the invention, a detailed description of these elements is also deemed unnecessary, it being sufficient to state that the elements **42***a*, **43***a*, **44***a*, **54***a*, **55***a* and **74***a* are substantially rectangularly-shaped while, on the other hand, the elements **42**, **43**, **44**, **54**, **55** and **74** are circular or annular. The guide plates **42***a*, **43***a* and **44***a*, the upper and lower retaining members **54***a* and **55***a*, and the cap **74***a* may be secured in assembled position in any desired manner.

By way of example, it will be observed in FIGURES 11 and 12 that opposite ends of the guide plates **44** fit in vertically extending groves **90** provided in the proximal surfaces of end frame members or bars **91**. It is apparent that opposite ends of the upper and lower outer guide plates **42***a*, **43***a* may also be positioned in the grooves **90** in the manner of the intervening guide plates **44***a*. The upper and lower retaining members **54***a*, **55***a* extend outwardly beyond opposite ends of the guide plates **42***a*, **43***a* and **44***a* and are suitably secured to the upper and lower ends of the corresponding end frame members **91**, as by screws **92** and **93**, respectively. The cap **74***a* may also be secured to the upper surface of the upper retaining member **54***a* by the screws **92**.

It is apparent that the various elements of the form of pattern device shown in FIGURES 10 through 13 may be assembled and the pattern face altered by adjustment of the pattern elements **24***a*, **25***a* in substantially the same manner as that described with respect to the first form of the invention. Also, it is apparent that the upper and lower retaining elements **54***a*, **55***a* and the cap **74***a* may be of somewhat different shape from that shown in FIGURES 10 through 12 depending upon the purpose for which the second form of pattern device is used. The second form of pattern device may also be secured to automatic machinery and in any desired manner and a detailed description and illustration of means for securing the same to such machinery is deemed unnecessary.

Since the attitude of the embodiments of the invention disclosed herein may vary, the terms "horizontal" and "vertical," and the equivalents thereof, are used in the specification and claims for purposes of orientation only and are not to be construed as limitations.

It is thus seen that I have provided novel pattern devices comprising body members provided with slots therein in which the shanks of novel pattern elements or butts are movably supported, with the shanks extending through the body so as to move any desired pattern butts, individually, in groups or in toto, outwardly to operative or active position, and wherein means are provided for releasably locking the pattern elements or butts in the desired selected position.

It is particularly important to note that the present invention provides an alterable pattern face for knitting machine pattern drums or other pattern devices in which the pattern elements remain intact with respect to the body of the pattern device at all times regardless of alterations made in the pattern, thus making it possible to set up original patterns or to alter the face of the pattern device in a fraction of the time heretofore consumed in setting up and altering the pattern face of prior pattern devices, with consequent less expense in setting up and altering the pattern face, as well as enabling increased production on the automatic machinery with which the improved pattern device is used, and obviating the necessity of providing special tools for use in altering the pattern face.

In the drawings and specification there have been set forth preferred embodiments of the invention and, although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation, the scope of the invention being defined in the claims.

I claim:

1. A pattern device for a knitting machine comprising a plurality of vertically spaced substantially annular guide plates each having a plurality of circularly spaced projections on opposed inner and outer edges thereof, vertical spacer elements extending laterally of said plates and fitting between adjacent projections for maintaining the plates in vertical alinement, each spacer element being provided with a plurality of longitudinally spaced teeth thereon straddling, and thereby serving as spacers between, adjacent plates, the spacer elements at outer edges of the plates collectively serving as an outer wall and the spacer elements at the inner edges of the plates collectively serving as an inner wall with adjacent spacer elements defining slots therebetween, independent pattern elements selectively movable in said slots to different positions relative to the outer wall, and means for releasably retaining the elements in different positions relative to the axis of said plates.

2. A structure according to claim 1 wherein said pattern elements each has a shank thereon, one of said shanks being loosely mounted in each of at least some of said slots, a butt on the outer end of each shank and being adapted to engage said outer wall when in inactive position to thereby limit inward movement of the corresponding pattern element, said shank of each pattern element being of such length as to project inwardly from the inner wall at least while occupying inactive position to facilitate pushing each pattern element outwardly, and means limiting outward movement of each pattern element relative to the outer wall.

3. A pattern device for a knitting machine including a cylindrical body comprising a stack of vertically spaced annular guide plates each having a plurality of circularly spaced lugs on each edge thereof, spacer bars extending axially of said plates and fitting between adjacent lugs, each spacer bar being provided with a plurality of axially spaced teeth thereon straddling and thereby serving as spacers between adjacent plates, the spacer bars at corresponding outer edges of the plates collectively serving as an outer wall and the spacer bars at the inner edges of the plates collectively serving as an inner wall with adjacent bars defining slots therebetween, independent pattern elements positioned in the slots for inward and outward movement relative to the body, each pattern element having an operating end forming a pattern surface on the outer face of the body in accordance with the position occupied thereby with respect to the face of the body, means limiting inward and outward movement of each pattern element, and means for releasably retaining said elements in radially adjusted position relative to the body.

4. A structure according to claim 3 in which said last-

mentioned means comprises a plurality of elongated keys, and means on each pattern element engageable with a corresponding key for restraining the pattern element from movement relative to the body, said keys being movable relative to the body for withdrawing the same from engagement with said means on each pattern element.

5. A pattern device for a knitting machine comprising a cylindrical pattern carrier provided with a cylindrical outer face and having a plurality of axially spaced circular rows of substantially radially extending slots therein, independent pattern elements positioned in the slots for inward and outward movement relative to and radially of the carrier, each pattern element having an operating end adapted to project outwardly relative to the outer face of the carrier, and means for securing each of said pattern elements in each of at least two adjusted positions and in at least one position of which the respective operating end projects outwardly from said outer face of said carrier.

6. A pattern device according to claim 5 in which said carrier is of annular form and is thus provided with an inner face defining an axial opening in said carrier, and said pattern elements having respective portions which project inwardly of said inner face and are exposed in said axial opening when occupying, at least, their innermost positions with respect to said outer face.

7. A pattern device for a knitting machine comprising a plurality of vertically spaced substantially annular guide plates, a plurality of inner spacer elements extending substantially parallel to the axis of said plates and being attached to the inner edges of said plates, a plurality of outer spacer elements extending in parallel relation to said inner spacer elements and being attached to the outer edges of said plates, said inner and outer spacer elements being respectively arranged in circularly spaced relationship, the outer spacer elements collectively serving as an outer wall and the inner spacer elements collectively serving as an inner wall with adjacent spacer elements defining radial slots therebetween, independent pattern elements selectively movable in said radial slots to different positions relative to the outer wall, and means for releasably retaining said pattern elements in said radial slots in said different positions.

8. A structure according to claim 7 wherein said last-mentioned means comprises a plurality of elongated keys, and means on each pattern element engageable with a corresponding key for restraining the pattern element from movement relative to said plates, said keys being movable relative to said plates for withdrawing the keys from engagement with said means on the respective pattern elements to facilitate movement of the pattern elements from one to another of said different positions.

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