Dec. 12, 1961 T. C. LYSTER 3,012,423

MACHINE FOR KNITTING PATTERNED FABRICS

Filed Feb. 25, 1959 5 Sheets-Sheet 1

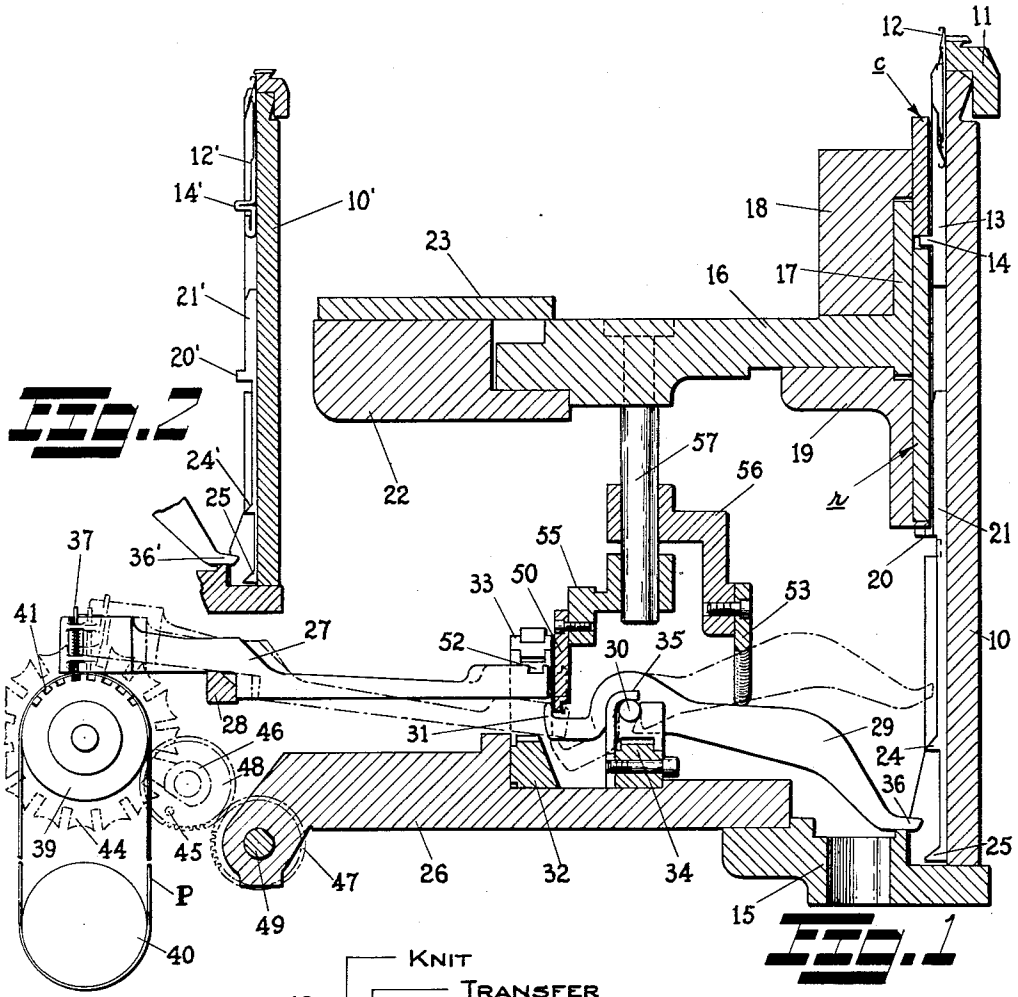


FIG. 1

FIG. 2

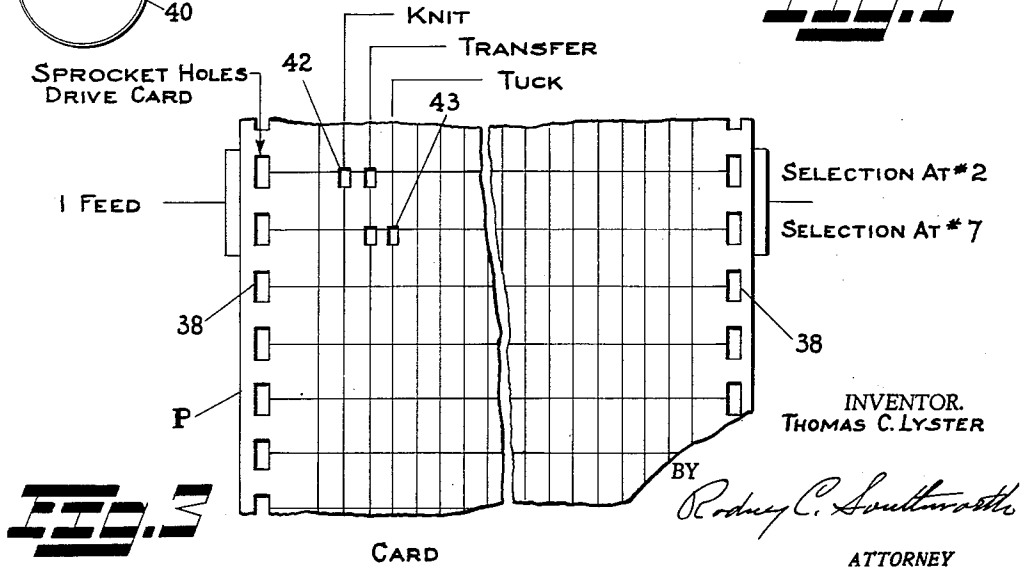


FIG. 3

INVENTOR.
THOMAS C. LYSTER

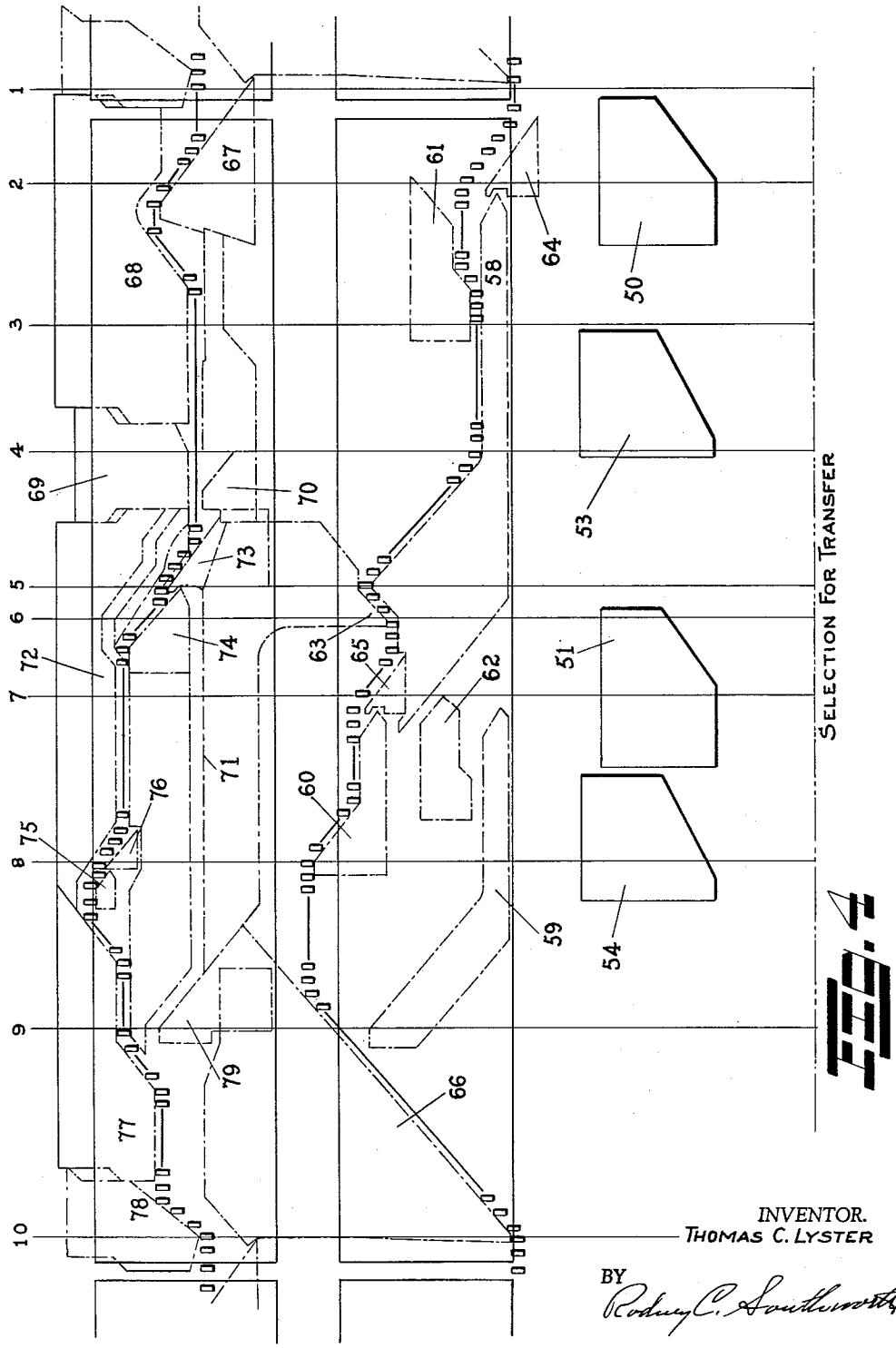
BY Rodney C. Southworth

ATTORNEY

Dec. 12, 1961 T. C. LYSTER 3,012,423

MACHINE FOR KNITTING PATTERNED FABRICS

Filed Feb. 25, 1959 5 Sheets-Sheet 2



INVENTOR.
THOMAS C. LYSTER

BY Rodney C. Southworth

ATTORNEY

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MACHINE FOR KNITTING PATTERNED FABRICS

Filed Feb. 25, 1959 5 Sheets-Sheet 3

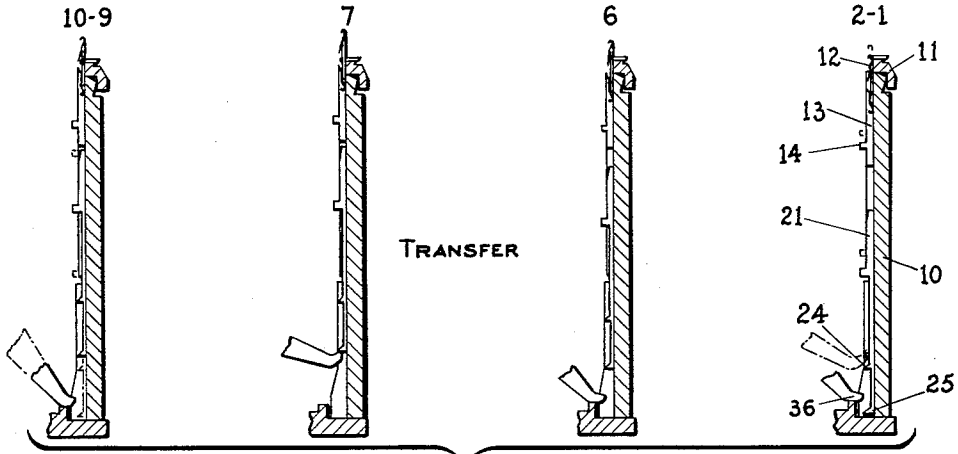


FIG. 4a

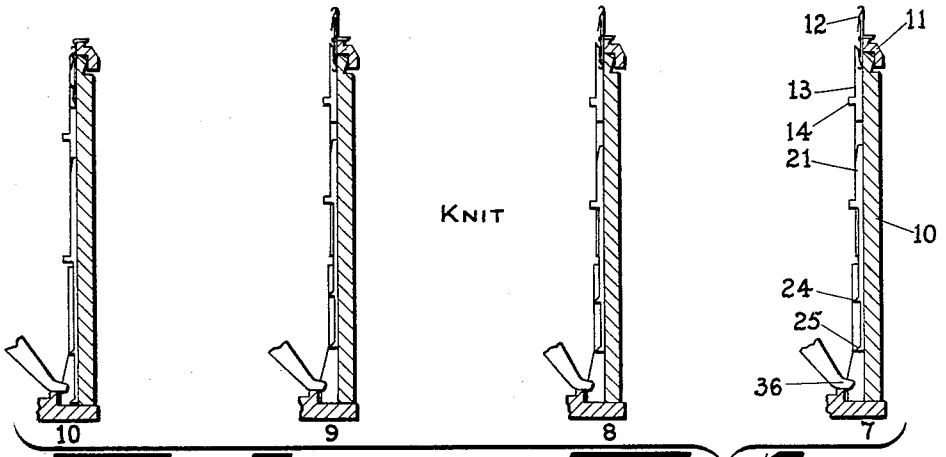
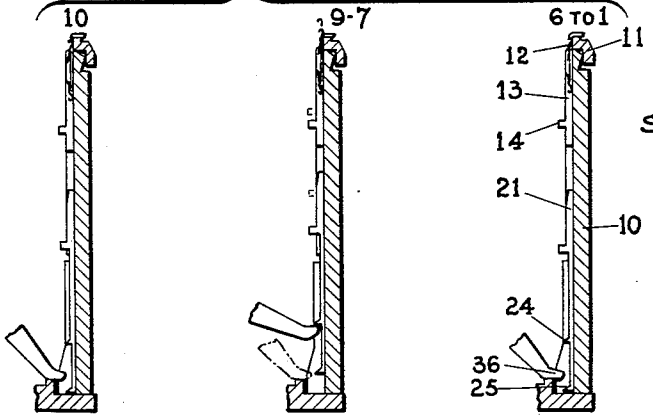


FIG. 6a FIG. 5a



INVENTOR.
THOMAS C. LYSTER

BY Rodney C. Southworth

ATTORNEY

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MACHINE FOR KNITTING PATTERNED FABRICS

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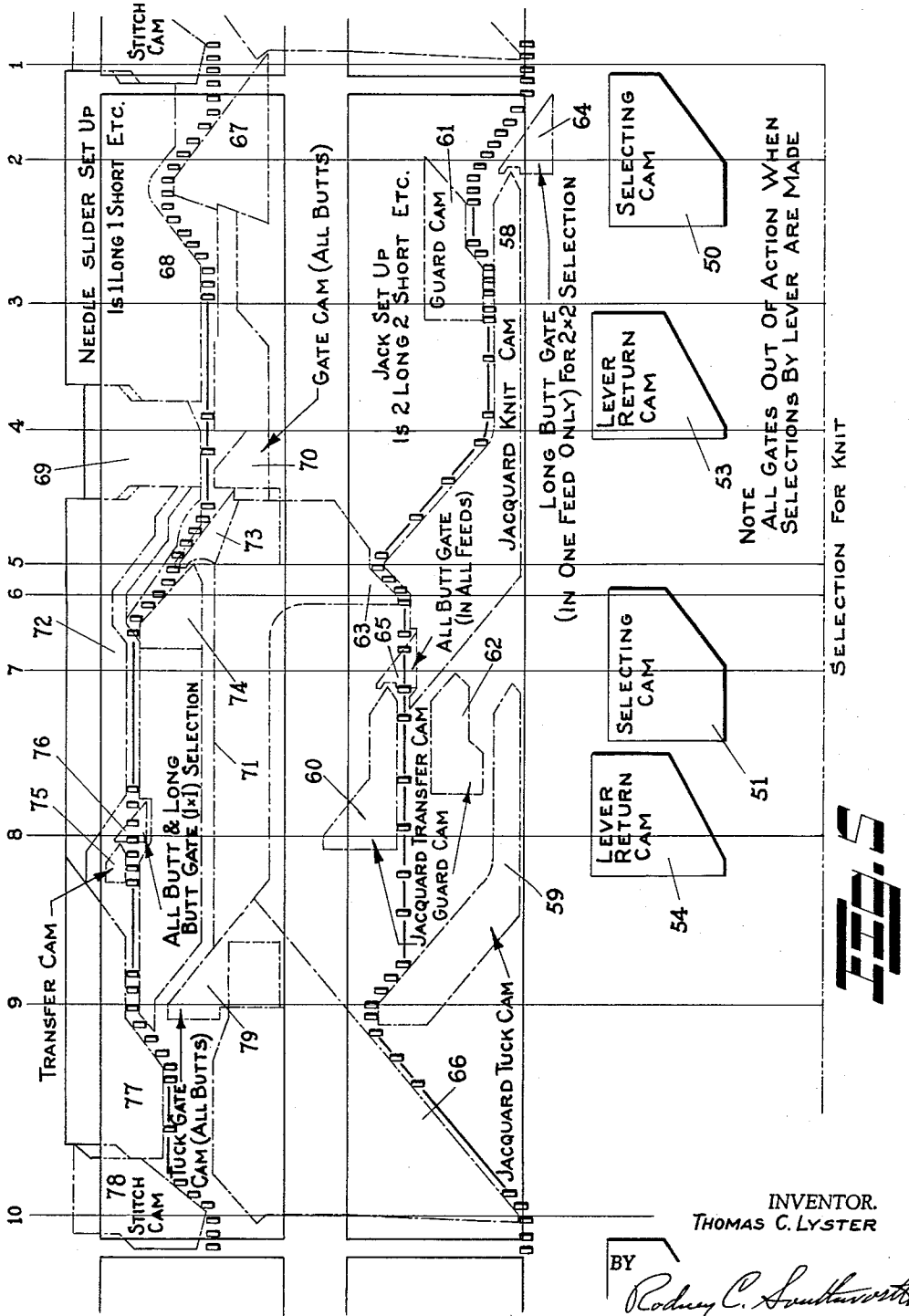


FIG. 5

INVENTOR.
THOMAS C. LYSTER

BY Rodney C. Southworth

ATTORNEY

Dec. 12, 1961 T. C. LYSTER 3,012,423

MACHINE FOR KNITTING PATTERNED FABRICS

Filed Feb. 25, 1959 5 Sheets-Sheet 5

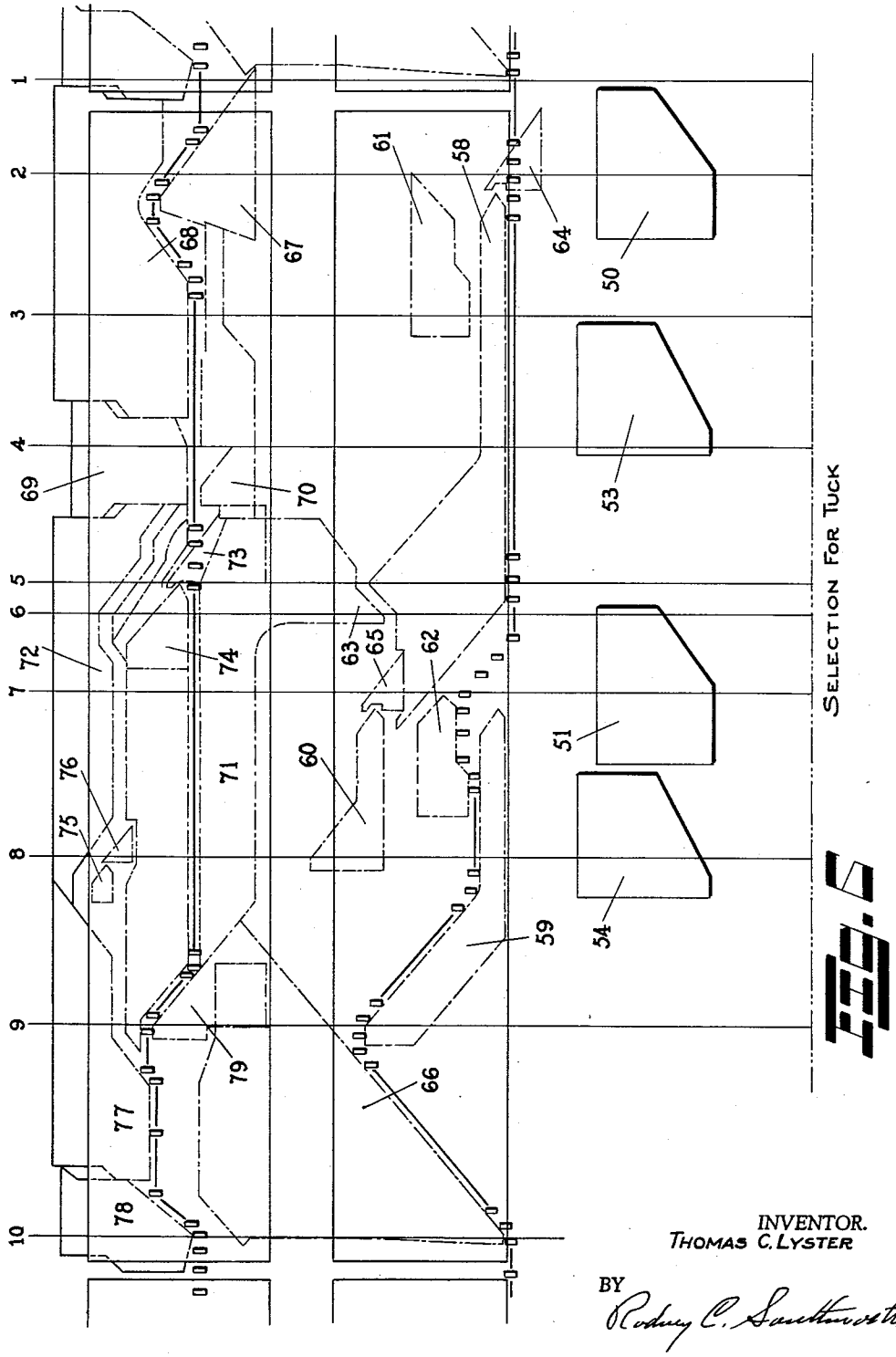


FIG. 5

INVENTOR.
THOMAS C. LYSTER

BY Rodney C. Southworth

ATTORNEY

United States Patent Office

3,012,423

Patented Dec. 12, 1961

3,012,423

MACHINE FOR KNITTING PATTERNED FABRICS

Thomas C. Lyster, Philadelphia, Pa., assignor to Wildman Jacquard Co., Norristown, Pa., a corporation of Pennsylvania

Filed Feb. 25, 1959, Ser. No. 795,494
14 Claims. (Cl. 66—50)

This invention pertains to pattern means for independent needle knitting machines and, more particularly, to such means employing a continuous strip pattern and having effect individually upon each of a bed of needles to cause them to perform any one of a number of possible functions at any and each feed of the machine.

It is a general object of the invention to increase greatly the pattern possibilities of multifeed knitting machines of the type described.

It is a more specific object to provide more possibilities as to the type of knitting function which may selectively be accomplished at each of the feeding stations of such machines.

A further object is that of providing means operable upon knitting needles or other instrumentalities prior to their entering cams at a knitting station of such machines which shall effect different selective motions or combinations of a plurality of such motions thereby to cause them to perform differing knitting functions.

Another object is that of modifying circular jacquard knitting machines so that at either or both of two selecting stations, stepped selective movements may be imparted to needles between each pair of knitting stations whereupon cams at such station will complete the intended function of said needles thus provided.

More specifically, it is an object of the invention so to devise cams at the knitting stations of a knitting machine of the type described along with a novel selecting means that in addition to causing needles to pass through any one or more of stations in welt position, any one or more of the needles may in predetermined sequence be caused to knit, to tuck or to transfer its stitch to another needle in another bed or to transfer the needle itself to another bed.

Other objects will appear from the following detailed disclosure.

In multifeed knitting machines such, for example, as the circular jacquard machines to which United States Patent No. 2,082,127 relates, there is provided between each yarn feeding and knitting station, a selecting means, preferably in the form of a periodically advancing, endless, strip pattern having holes punched in accordance with some desired pattern. The pattern means precedes the knitting station to which it applies having regard to the sequence of selection and knitting and as heretofore employed, a needle (or other instrumentality such as a slider, jack or the like) is acted upon to move it a predetermined distance from a non-selected position. Cams at the knitting station are so devised as to affect those instrumentalities selected in accordance with any one of three ways commonly utilized as a basis of pattern or change in the knitting function. For example, cams at a single station have been designed to cause selected needles to knit, to tuck or to transfer their stitches (this latter includes the movement of a double ended needle to the opposite bed to change the type of stitch to knit or purl as the case may be). While non-selected needles have welted, each feed had otherwise to be considered as a knitting feed, a tucking feed or a transferring feed. On various machines the set up of these feeds has been different, but it can readily be appreciated that the fabric designer has been very definitely circumscribed and has had constantly to bear in mind the limitations as to what he could do and could not do in any given machine.

According to the instant invention, cams at each of the several knitting stations have been so devised that needle or other instrumentality butts may pass through any one of several, preferably four pathways, these corresponding and serving to effect appropriate one of the four possibilities above enumerated. While such provision is made at the cams themselves, that would avail nothing useful over what has been done before were it not for novel and extensive changes to the pattern means which govern which of those pathways a particular needle or needles shall enter and follow.

According to a preferred form of the mechanism, a pattern drum or drums are disposed in advance of each knitting station and each drum is provided with means to advance it in two independent, time-spaced steps. The distance between feeds determines whether or not one or more drums shall intervene, but actually, these may be considered as a single roll or drum having levers associated therewith, one for each needle in the sector spanning the space from a given point at one knitting station to a similar point at the next. A Geneva motion or other means is used to step the drum ahead the two moves while the cams move through the sector above mentioned.

These drums are slotted as before, but the pattern is differently formed in that two rows of perforations or other pattern determining indicia are set up and are identified with or function incidental to each station.

Needles or other instrumentalities to be selected preferably have jacks associated with them which have two elevating butts spaced as and for a purpose to be described. They also have a master or cam engaging butt. In preferred instances these are set up to effect some selectivity when no selection from the pattern means is to be used.

The levers selected by the pattern are first pushed inwardly to enter the path of so-called jacquard cams which may depress those levers. Since the first levers act upon a second set of pivoted levers the motion is reversed and the inner ends of the latter act in needle or jack slots and may engage either one or the other of the elevating butts on their respective jacks. Return cams are provided and there are two sets of these selecting and return cams serially disposed.

The pattern is so set up that a pair of aligned apertures effects a selection for the next knitting station, the first row of these being identified with knitting, the second with tucking and both acting together to effect transfer. For a first selecting motion a lever end catches beneath the upper of the two butts, but however, the knitting selection precedes the tucking. That means that a jack or jacks thus raised at said first selection have their master butt enter a pathway which will cause associated needles to pass through the cams for effecting knitting. The second, acting later in the cycle, causes its needle or other butts to be raised to a different pathway, one identified with tucking. If a selecting lever is affected by a pattern indication in both the first and second moves of the drum, then its lifter lever acts twice prior to needles arriving at the knitting station and lifts its jack first by the upper butt and then by the lower. This results in the corresponding needle being raised until its master butt aligns with a third or transfer pathway.

In certain simple situations the needles are controlled without resort to jacks or the selecting mechanism as will be explained.

The invention will be described in detail by reference to a preferred form thereof as applied to two different types of machine to which it is applied and as illustrated in the accompanying figures of drawing, wherein:

FIG. 1 is a section taken through a part of a double

cylinder knitting machine to which the invention has been applied;

FIG. 2 is a section showing the manner in which the invention is applied to a different type machine;

FIG. 3 is a fragmentary view of a pattern used;

FIG. 4 is a developed view of needle and jack cams showing positions and pathways incidental to transfer;

FIG. 5 is a similar view showing the relationship for knitting;

FIG. 6 likewise relates to tucking;

FIG. 4*a* supplements FIG. 4 further to illustrate the action at transfer;

FIG. 5*a* similarly relates to FIG. 5 and knitting, while

FIG. 6*a* serves to supplement the tucking as shown in FIG. 6.

Now referring to FIG. 1, the invention applies to practically any independent needle knitting machine in which extensive pattern work is to be done and is here shown in a double cylinder machine, the general nature of which is well known. A lower cylinder **10** is topped by a sinker ring and/or verge plate **11** and is slotted to act as a needle bed for the conventional double hooked needles **12** which are directly controlled at their lower ends by sliders **13** having butts **14**. Since the illustration relates to a rotary cam, fixed needle cylinder machine, the cylinder **10** is fixed to a base member **15**, in turn a part of a more complete supporting frame.

A cam cylinder made up in sections comprises a disk or plate **16** having a flange **17**, section rings **18** and **19** and, of course, several cams, two only of which are shown here and which are generally indicated as a slider draw down cam *c* and a guard or raise cam *r* effective upon butts **14**, the latter cam, however, also being possible of action upon other butts **20** of jacks **21**, one of which is positioned beneath each slider. This plate **16** is borne in a fixed bearing member **22** capped by plate **23** and is rotated by gearing of known form (not shown).

The jacks **21** also have upper and lower lifter butts **24** and **25**.

While not shown it is to be understood that such a machine has the usual top needle cylinder, upper cam sets for acting upon sliders in that cylinder and which control needles **12** whenever they are transferred to that top cylinder. The details and general operation of such double cylinder machines are so well known that it would serve no useful purpose to illustrate and describe them further here.

Still referring to FIG. 1, selecting means of the jacquard type is provided and support upon an extending ring or bracket **26** of which there may be as many segments as there are separate pattern units per machine. Each unit covers a sector of needles and jacks and these sectors are evenly divided between knitting stations.

These selecting units, as illustrated in United States Patent No. 2,281,721 include, among other parts pivoted selecting levers **27** which bear upon bar **28** and when selected, may be pushed radially inwardly against the resistance of springs (not shown), and lifter levers **29** pivoted at rod **30** and having their ends **31** beneath the inner ends of the selector levers and positioned in the same guiding slots therewith. A guide member **32** extends up to **33** and is constituted as a reed or slotted means by which the ends of the levers are maintained in alignment and are restrained to a vertical path of motion as affected by cams to be described.

Pivot pin **30** is held in a similar slotted guide **34** by a clamp **35** and thus levers **29** may pivot but are held laterally. Their inner ends **36** are guided in the needle and jacks slots, the lower cylinder end being flared as shown for presenting a better bearing from which these ends may not escape even though they swing in a considerable arc.

Levers **27** are similarly guided by means (not shown) evident in the patent noted above, and each of these levers has at its outer end a spring pressed pin **37** or the like which functions as a feeler at the surface of a pattern strip P of the general type used on these machines.

This strip, a fragment of one of which is illustrated in FIG. 3 may be made of backed paper or any suitable plastic and has sprocket holes **38** at each side, these being engaged by teeth at the ends of a driven roll **39**. A weight or tension roll **40** maintains the pattern taut and in mesh with the sprocket teeth on roll **39**.

Roll **39** has a plurality of longitudinally disposed slots **41**, preferably spaced substantially the same distance as has heretofore been the case, but however, spaced and related to the sprocket teeth in such a way that pin **37** aligns with a slot when roll and strip have been advanced a step by their intermittent drive.

While these devices as utilized heretofore have had a single row of pattern perforations effective in determining the pattern results at a succeeding station, here the pattern is advanced two steps (two slots) one after the other in time spaced sequence so that two rows of perforations are now availed of to determine what shall be effected at a succeeding station. As set up, the leading row of perforation **42** determines the pathway of jacks and needles insofar as knitting goes while the second row in which perforation **43** is found governs tucking. What has just been said applies when such a perforation **42** or **43** is not followed or preceded by another in the same longitudinal line considering only that pair of rows then acting for a following station's selection. In case each row of a pair has a perforation aligned to affect a single selector lever, the result is transferring as will be explained.

Roll **39** is advanced intermittently by the usual Geneva mechanism driven from any part of the machine rotated at a uniform speed related to the progression of the cams past the needles. That means comprises a Geneva wheel **44**, a pin **45** and locking disk **46** and is in turn rotated by gears **47** and **48**. Gear **47** is fixed to a shaft **49** borne in the end of bracket **26**. In practice each unit is driven from that adjacent going back to one master gear which takes motion from connection to a primary rotary element as in United States Patent No. 2,082,127.

As shown in FIG. 1 and in each of FIGS. 4–6, levers **27** are acted upon by selecting cams **50** and/or **51** if these levers are selected by the pattern means. If the selection is one for knitting, then cam **50** pushes down on the end of such levers as are to control that function. The cam is narrowed at its active end and engages in a notch **52** at the lever ends. Cam **51**, following and thus acting later, engages and presses down those selector levers which are pushed in at the second advance of the pattern and thus control tucking. The spacing and timing is such that after a group of needles equivalent to the number spanned by a single drum and pattern have been selected and the cam **50** has acted upon them, there will be time for a release of levers and a second selection (second row of perforations) whereupon cam **51** will then function on the levers selected at that second step.

A lever selected and pressed down will raise its cooperating lifter lever **29**, the end **36** of which will swing as shown to the dot-and-dash line position, FIG. 1. In so doing it will engage butt **24** of that jack it is designed to control lifting it as shown in position 1—2, FIG. 4*a*. That will position butt **20** of the jack to enter an active pathway as will be explained.

While gravity would tend to return the parts to a non-active position, more positive action is assured by lever return cams **53** and **54**, one for each selecting step. These act on levers **29** as shown in FIG. 1.

Cams **50** and **53** are adjustably carried by brackets **55** and **56**, respectively, the latter being fixed to a rod **57** or other support depending from the rotating cam ring **16**. Cams **51** and **54** are similarly supported.

In the event a transfer is to be effected cams **50** and **51** are active in succession on the same lever or levers and at the first selection lifter levers raise their jacks as

in 1—2, FIG. 4*a*, and then these levers return to their lowermost position clearing the lower butts **25** as they do so. As will be shown better later, jacks are then elevated by certain of the cams and the second selection raises lifter levers which then engage the butts **25** to elevate their jacks to the position 7, FIG. 4*a*. Jacks then control their respective needles to transfer.

Now having described the selection, reference to FIGS. 4, 5 and 6 is made incidental to explaining cams and butt pathways. In FIG. 5 marked "Knit" the lowermost cams have been explained. The next level comprises cams effective upon the jack butts **20**. It is to be understood that if no selection is effected then butts **20** pass beneath these cams and, of course, corresponding needles hold their stitches (welt).

Cam **58** is termed a "jacquard knit cam" and raises jacks selected for controlling needles to knit to such a pathway that slider butts will raise needles to clear latches, take yarn and then draw a stitch.

Cam **59** is a "jacquard tuck cam" and performs a similar function on selected jacks, but later in the cycle so that slider butts are not engaged with a clearing cam, but with one which will only raise needles to take yarn in addition to a stitch already held.

Cam **60** is a "jacquard transfer cam" and acts on butts of jacks which have passed up over cam **58** and have also been affected by the second selection.

Cams **61** and **62** are guard cams and serve to prevent jacks passing through at too great a height at critical points. Cam **63** lowers jacks selected to control knitting so they will pass under cam **60** except where transfer is to be effected. All these cams are always fixed and in against the cylinder.

Two gate cams **64** and **65** are movable and pattern controlled. Normally, or when jacquard patterning is being done, these gate cams are withdrawn. They do, however, function when the pattern is not in action to make simple 2 x 2 rib work.

Cam **66** lowers all jacks to initial position at the completion of a cycle.

At the upper third, more or less, of the cam assembly a plurality of cams are so devised and arranged as to control sliders and their needles as governed by the jacks.

The cam **67** engages all slider butts at the start of the cycle and raises them and their needles to tuck position for the purpose of hanging a fabric on the needles as may be necessary after a "drop off" or "press off."

Cam **68** then lowers the needles which pass under cam **69** which is the top one of gate cams **69** and **70**, later to be described. Butts pass between these without being affected by them and then pass along cam **71** which is integral with cam **63**. These gate cams are withdrawn when using the pattern selection but utilized at some other times. Butts pass under cam **72** as shown. Cam **73** is likewise movable and is withdrawn when the jacquard means is effective.

Cam **74** acts as a guard cam for needles not raised at the first selection and also as a raise cam for those which are selected to knit or to transfer. It raises needles high enough to clear their latches and also to yarn taking level.

Cam **75** is a transfer cam and gate cam **76** which precedes it is in against the cylinder or in position to contact butts only when it is desired to transfer without resort to the jacquard selection.

Cam **77** lowers needles from clearing or sliders from transfer positions and as they pass under that cam they take any yarn in feeding position and then draw stitches under stitch cam **78**. Stitches may be held in that position except as needles are again selected to knit, tuck or transfer although, of course, they may be relieved slightly.

Cam **79** is a tuck gate cam and is likewise movable. When using the pattern means, it is out of action since the second selection raises slider butts to the same level. The top edge of cam **66** merely prevents sliders from descending below a welting pathway.

Now having described the mechanism involved and its general function, a résumé and short description of what takes place during each of the possibilities will serve for a complete understanding of what has been accomplished. Referring to FIGS. 5, 4*a* and 5*a*, for any needle or needles which are to knit at a station the pattern strip P should have a perforation **42** in the first of a pair of rows of perforations in the pattern which are in position to be engaged by the pins **37** of the levers **27** applying to those needles. The drum is advanced and cam **50** acts to swing the levers, ends **36** of levers **29** engaging butts **24** to lift the jacks so their butts **20** are elevated above cam **58**. Cam **61** acts to return them to a slightly lower position whereupon the cam passes them raising them to such a level as they clear the top point of cam **58**, that the needle slider butts take a pathway over the point of cam **74**. The jacks have done their work and are retracted by cam **63** to pass under cam **60** and then to return to original position by cam **66** although they are elevated by tuck cam **59**. This latter is an idle motion since the corresponding needles are already at a knitting level. Needles are acted upon by cams **77** and **78** to take their yarn or yarns and to knit. In FIG. 4*a*, positions 1—2 shows the jack elevation at selection. In FIG. 5*a* positions 7—10 show the relative relationship of the parts for corresponding positions which are marked at FIG. 5.

Now referring to FIGS. 6 and 6*a*, needles which are to tuck have that part of the pattern effective thereon at a particular knitting station provided with perforation **43** in the second row of the appropriate pair. The corresponding levers are pushed in at the second advance of the drum and cam **51** acts as did cam **50** to raise its jack although it does so as shown in FIG. 6 at a point just in advance of cams **59** and **62**. Thus butts **20** enter a pathway above cam **59** which eventually raises them and corresponding sliders and needles to tuck level. The slider butts are elevated in the pathway shown and are slightly lowered by cam **77**. Their needles do not clear but do take yarn and draw it into a stitch along with a previously drawn loop or loops as they are controlled by cam **78**.

The positions 1—6, 7—9 and 10, FIG. 6*a*, show relationship of the elements at corresponding positions in FIG. 6.

In FIGS. 4 and 4*a*, pathways of butts and element positions incidental to transfer are shown. The pattern must provide apertures in both rows of a pair and the selection at the first raises jacks as in previously described situations so they enter above cam **58** and thus affect their needles so slider butts pass over cam **74**. Now, they would if not further selected, go on to knit, but the second selection affects the raising levers at cam **51** so they lift jacks by butts **25**, position 7, FIG. 4*a*. That causes butts **20** to be positioned above the point of transfer cam **60** so when raised thereby, they will elevate their slider butts above the point of cam **75**, the transfer cam. Then those sliders raise their needles into the top cylinder whereupon they are released from the lower and will knit with needles at the top in a manner well known to those conversant with double cylinder type machines. The sliders **13** then return to inactive or welt position as governed by cams **77** and **78**.

While these different possibilities have been described separately and somewhat disconnectedly for purposes of simplifying the disclosure, it is to be understood that all these functions may be governed to occur in any sequence, frequently or at widely spaced intervals, there being no practical limitation except ingenuity in setting up the pattern which may be of considerable length so that it does not repeat in the same garment. In fact, considering four needles approaching a knitting station, one may have no selection applied to it in which event it will welt, a next may knit, the next tuck and the fourth be transferred to the top cylinder. Since the machine is preferably a multifeed one, these functions may vary from

course to course and the same needles when again affected by selection at the original station considered, may be affected in a manner in no wise dependent on what happened at their first or previous engagement.

The specific illustration and disclosure to this point has been with reference to a double cylinder machine in which the transfer is one of a needle from a lower cylinder to an upper or vice versa, although most such machines have the pattern control largely active at the lower of the two. It is, of course, fully possible to use the invention in other classes of knitting machines, e.g., open top sinker head machines, dial and cylinder equipment and the instrumentalities acted upon may be needles, sinkers, jacks, sliders and the like.

For example, as shown in FIG. 2, a cylinder **10'** may be slotted to accommodate needles **12'** having butts **14'** which are a part of the needles themselves. Jacks **21'** have similar butts **20'**, **24'** and **25'** and may be raised selectively by lifter lever ends **36'**. Here needles may be caused to knit, tuck or welt, and, if the machine is of the type in which stitches are to be transferred from these cylinder needles to dial needles (not shown) then the cylinder needles may be controlled to effect such transfer. The needles are preferably of the type in United States Patent No. 2,326,694 in that case.

The disclosure here relates to machines in which the needle cylinder is stationary while the cams rotate to move past needle, slider and jack butts, however, the opposite is equally feasible, such machines being considered no more than alternate forms of a type depending upon the general requirements, preferences of the builder, etc.

The system is also capable of functioning in flat machines and in reciprocatory work.

In certain situations, for example, when transferring all needles from one cylinder to another or when starting 1 x 1 rib or 2 x 2 rib, the gate cams may be used and the selection held out of action. Briefly, 1 x 1 rib may be effected by gate cams acting on needles. These are set up with alternate needles or sliders having long butts and intermediate ones having short butts. Cam **70** raises all butts while cam **76** acts on butts of all lengths, or on just long butts depending upon its position. If part way in it affects long butts to transfer them to the top cylinder, 1 x 1 rib may then be knitted.

By jacks which are set up 2 long-2 short butts in alternation, gates **64** and **65** act to raise long butt jacks and their needles to the top cylinder and thereby start 2 x 2 rib work. These gate cams and their function have been used and understood for some time so need not be further described here. They are illustrated and mentioned briefly to point out the fact that they can be utilized independently of the selection by the pattern means and that the latter is not affected by their presence.

While one embodiment of the invention has been disclosed, it is to be understood that the inventive concept may be carried out in a number of ways. This invention is, therefore, not to be limited to the precise details described, but is intended to embrace all variations and modifications thereof falling within the spirit of the invention and the scope of the claims.

I claim:

1. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means being effective individually upon predeterminable ones of said needles for directing them to be affected by some of said cams and also effective upon others thereof by two independent selecting movements thereupon to direct them to be affected by others of the said cams.

2. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means being effective in time spaced movements upon predetermined ones of said needles to move them to a height for directing them to be affected by some of said cams and also selectively effective upon others by two independent selecting movements thereupon to move them to a different height to direct them to be affected by others of the cams.

3. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means being effective by up to two independent selecting movements upon predetermined ones of said needles to raise them to any one of three different heights thereby to effect any one of three corresponding knitting functions.

4. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means being effective individually to raise needles to one of two different heights for effecting either of two corresponding knitting functions and further effective conjointly upon others of the needles to raise them to a third height to effect another and different knitting function.

5. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means comprising means effective upon needles to permit them to be displaced a predetermined total distance by a plurality of independent selecting movements.

6. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means comprising means effective in conjunction with one at least of said cam means for displacing said needles a total distance by a plurality of independent selecting movements, the sum of which are less than the total distance instrumentalities are displaced.

7. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means

serially disposed to affect said needles for actuation by said cams, said selecting means comprising jacks effective upon needles, jack cams and jack displacing means operable to move predetermined ones of said needles to a level for directing them to be affected by some of said cams and also selectively effective upon others to displace them by two independent selecting movements thereupon to a different level to direct them to be affected by others of the cams.

8. Mechanism as defined in claim 7 wherein said jacks have two spaced lifting butts and a master butt and said jack displacing means includes selectively actuable lifter means.

9. Mechanism as defined in claim 7 wherein said jacks have two spaced lifting butts and a master butt and said jack displacing means includes selector and lifter levers for each jack, cam means normally out of range of selector levers but effective for displacing such of said levers as are selected and movable pattern means for determining the position of said selector levers.

10. Mechanism as defined in claim 7 wherein said jacks have two spaced lifting butts and a master butt and said jack displacing means includes a lifter lever for each jack, a selector lever for rocking said lifter lever and cam means out of range of selector levers when they are not affected by pattern means and engageable with such levers when they are rendered active by the pattern means, said pattern means comprising a periodically advancing means for selectively projecting said selector levers into the pathway of said cam means.

11. Mechanism as defined in claim 7 wherein said jacks have two spaced lifting butts and a master butt and said jack displacing means includes a lifter lever for each jack, a selector lever for rocking said lifter lever and cam means out of range of selector levers when they are not affected by pattern means and engageable with such levers when they are rendered active by pattern means, said pattern means comprising two units serially disposed and effective for imparting either a first or a second selecting movement to any selector lever and also, successive selection of a lever at both units.

12. In an independent needle knitting machine having a needle bed, needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means being operable selectively to impart up to two selecting movements to the same needles in any one given course of knitting.

13. A selecting means for instrumentalities in independent needle type knitting machines which comprises instrumentality displacing means, other means for selectively actuating said displacing means including cams and pattern responsive devices active selectively to impart up to two successive selecting movements to the same displacing means in any one given course of knitting.

14. In an independent needle knitting machine having at least one knitting station, a needle bed, a group of needles carried by and movable in said bed, a cam support means and cams carried by said means, said needles and cams being relatively movable for imparting to the needles movements of different extents selectively to effect varied knitting functions at a single knitting station, a plurality of selecting means serially disposed to affect said needles for actuation by said cams, said selecting means being adapted to impart selectively up to two successive displacing movements to the same needles in a single passage thereof through a knitting station.

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