May 31, 1966 J. PACE 3,253,428

REPLACEABLE, REVERSIBLE PATTERN GUIDE JACK FOR AUTOMATIC KNITTING MACHINES

Filed April 18, 1962

FIG. 1

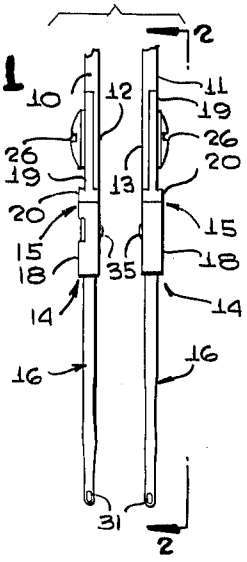


FIG. 2

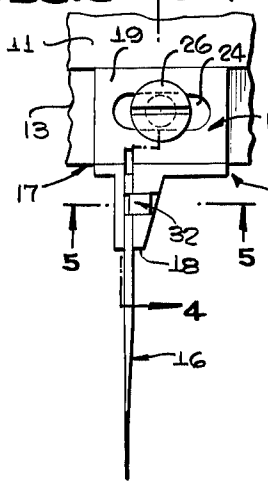


FIG. 3

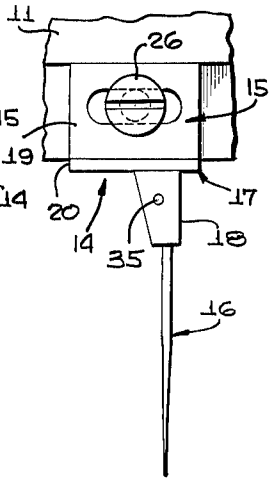


FIG. 4

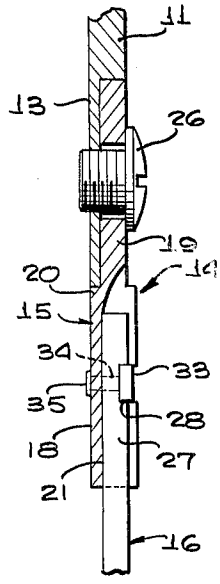


FIG. 6

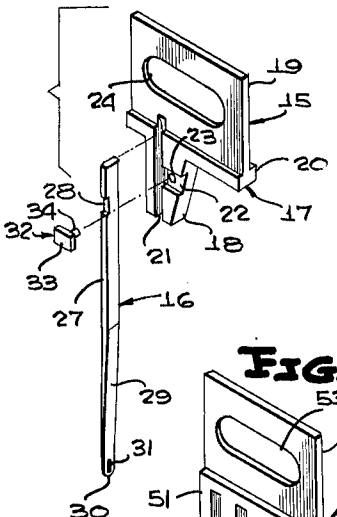


FIG. 7

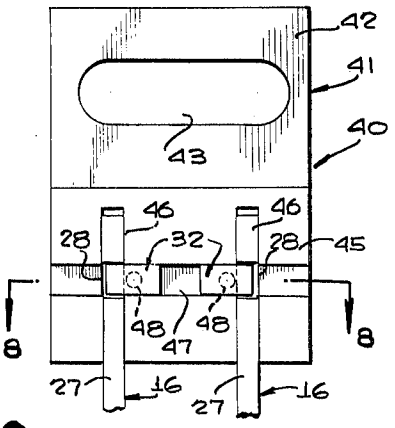


FIG. 9

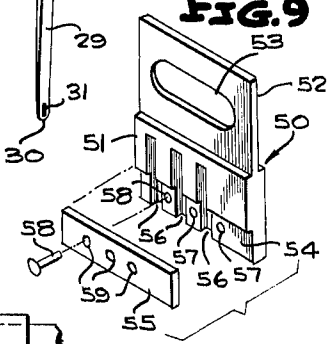


FIG. 8

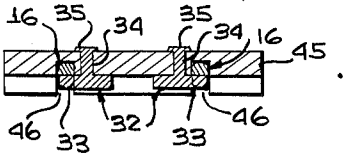
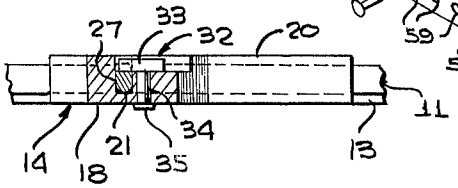


FIG. 5



INVENTOR
JOSEPH PACE

BY Mason, Porter, Dillon & Stewart
ATTORNEYS

United States Patent Office

3,253,428

Patented May 31, 1966

3,253,428

REPLACEABLE, REVERSIBLE PATTERN GUIDE JACK FOR AUTOMATIC KNITTING MACHINES

Joseph Pace, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn., a corporation of Maine

Filed Apr. 18, 1962, Ser. No. 188,411
9 Claims. (Cl. 66—126)

This invention relates in general to new and useful improvements in automatic knitting machines, and more specifically to a novel pattern guide unit which is both replaceable and reversible.

In automatic knitting machines, particularly warp knitting machines, pattern guide units are used in the knitting of patterned fabrics. These pattern guide units carry either a single or a plurality of guides and are mounted on pattern guide bars which are disposed in back of the regular guide bars. The pattern guide units are used in the knitting of the desired pattern in a fabric, and are shifted or set at intervals depending on the pattern desired. There may be a number of the pattern bars in a knitting machine, and the pattern guide units are mounted at spaced intervals on the pattern bars in accordance with the operation of the various pattern bars and the pattern of the fabric.

Unlike the regular thread guides of a knitting machine, the pattern guide units are not mounted in substantially continuous rows. As a result, each pattern guide unit includes a pattern jack which carries one or several guides. At the present time, the pattern guide units are not universal, with the result that it is necessary to retain on hand a number of pattern guide units. Further, the guide of each pattern guide unit is presently so secured to the jack of the pattern guide unit that it is not practical to replace a guide of the pattern guide unit when the guide breaks. As a result, whenever breakage or damaging of the guide occurs, it is also necessary to throw away the jack of the particular guide unit. However, the jacks are specially machined and are relatively expensive. In view of this, it is highly desirable to so mount the guide within the jack so that the guide may be readily replaced, and this is the primary object of the invention.

Another object of this invention is to provide a novel guide unit for automatic knitting machines, the guide unit being preferably of the pattern guide type and being formed of a jack and at least one guide carried by the jack, the jack having a seat receiving the upper portion of the guide, and suitable fastening means releasably retaining the guide in the jack seat.

Another object of this invention is to provide a pattern guide unit which includes a special jack and a guide carried thereby, the jack having a seat formed therein in the form of an elongated groove, the seat receiving the shank of a pattern guide, and a fastener carried by the jack with the fastener being seated in a slot in the guide shank to prevent relative movement of the guide with respect to the jack.

A further object of this invention is to provide a novel pattern guide unit wherein the jack has an upper mounting portion which is of a symmetrical cross-section whereby the jack may be mounted on opposite sides of pattern guide bars so that a single pattern guide unit may be mounted to selectively face in opposite directions.

Still another object of this invention is to provide a novel pattern guide unit including a jack and at least one guide carried thereby, the jack being reversible so that opposite faces thereof may be secured to pattern guide bars, and the guide being offset with respect to the center of the jack whereby the guide may be selectively offset to the right or to the left of a predetermined point which corresponds to the center of the guide jack when the guide unit is mounted on the pattern guide bar.

A still further object of this invention is to provide a novel pattern guide unit for use in automatic knitting machines which includes a jack carrying a guide, and with the jack being reversible so as to face in opposite directions, and the guide being offset from the vertical center of the jack so as to permit the same guide unit to be utilized in either a left-hand or right-hand structure, and the jack being further provided with an elongated slot wherein the guide unit may be adjustably mounted on the guide bar which supports the same.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claims and the several views illustrated in the accompanying drawing:

In the drawing:

FIGURE 1 is a schematic end view of a pair of pattern guide bars and shows mounted thereon pattern guide units in accordance with the invention, the pattern guide bars and the pattern guide units being bracketed together.

FIGURE 2 is a fragmentary elevational view taken along the line 2—2 of FIGURE 1, and shows the general details of a pattern guide unit.

FIGURE 3 is an elevational view similar to FIGURE 2 and shows the pattern guide unit reversed in its position on the guide bar.

FIGURE 4 is an enlarged fragmentary vertical sectional view taken along the line 4—4 of FIGURE 2, and shows further the details of construction of the pattern guide unit and the manner in which it is mounted on the pattern guide bar.

FIGURE 5 is an enlarged fragmentary transverse sectional view taken along the line 5—5 of FIGURE 2, and further shows the specific manner in which the guide is replaceably secured to the jack.

FIGURE 6 is an exploded perspective view of the guide unit with parts bracketed and shows the specific details thereof.

FIGURE 7 is an enlarged fragmentary elevational view of a modified form of pattern guide unit which includes two guides.

FIGURE 8 is a fragmentary horizontal sectional view taken along the line 8—8 of FIGURE 7, and shows the manner in which the two guides are releasably secured to the jack.

FIGURE 9 is an exploded perspective view of still another form of pattern guide unit which utilizes three guides, the parts being bracketed and the guides being omitted for purposes of clarity.

Referring now to the drawings in detail, reference is first made to the schematic showing of FIGURE 1, wherein there are illustrated two pattern guide bars 10 and 11 having narrow lower portions 12 and 13, respectively. It is to be noted that the lower portion 12 is offset in an opposite direction from the lower portion 13 so that the pattern guide bars 10 and 11 may be considered to be left hand and right hand, respectively. At this time, it is pointed out that the illustrated pattern guide bars 10 and 11 are only schematic examples of pat-

tern guide bars in an automatic knitting machine, and that a knitting machine would have a greater number of the pattern guide bars and they would not necessarily be disposed in closely spaced parallel relation, as is shown in shown in FIGURE 1.

Each of the pattern guide bars **10** and **11** has at least one pattern guide unit secured to the lower end thereof. The pattern guide units carried by the guide bars **10** and **11** are identical, and are referred to by the numeral **14**.

Reference is now made to FIGURES 2, 4 and 6 in particular, wherein it will be seen that the pattern guide unit **14** carried by the pattern guide bar **11** is formed of a jack, generally referred to by the numeral **15**, and a replaceable guide, generally referred to by the numeral **16**. The jack **15** is formed of an upper mounting portion, generally referred to by the numeral **17**, and an integral depending leg **18**. The mounting portion **17** is of an inverted T-shaped cross-section and includes a centrally located plate-like portion **19** and a lower bar portion **20**. The leg **18** is integrally connected to the bar portion **20** and functions as a depending extension thereof.

As is best shown in FIGURE 2, the leg **18** is offset from the vertical center line passing through the mounting portion **17**. The leg **18** is provided with a vertically extending seat **21** which extends the full height of the leg **18** and is in the form of an elongated groove machined or otherwise formed into the leg **18**. When the seat **21** is machined in the leg **18**, such as by milling the seat **21**, the seat may extend up through the bar portion **20** and the plate-like portion **19**, although this is not necessary.

The same face of the leg **18** in which the seat **21** is formed, is provided with a slot **22** which extends transversely of and opens into the seat **21**. The slot **22** has formed at the base thereof a bore **23** for a purpose to be described in detail hereinafter.

At this time, it is pointed out that the plate-like portion **19** of the mounting portion **17** may be shaped either by machining or during the initial casting of the jack **15**. The manner in which the jack **15** is formed, either by casting, machining, etc., is not a part of this invention.

The plate-like portion **19** is also provided with an elongated slot **24** which extends transversely of the axis of the seat **21** and permits lateral shifting of the jack **15** with respect to the pattern guide bar **11**, for example. A fastener **26** carried by the pattern guide bar **11** passes through the slot **24** and adjustably secures the jack **15** to the pattern guide bar **11**.

The guide **16** may be of any construction, but must have a straight upper shank portion **27** with a transverse slot **28** therein corresponding generally to the slot **22**. In the illustrated form of guide **16**, the guide **16** has a downwardly tapering lower portion **29** which terminates in a rounded lower end **30** and which is provided in the lower end thereof with an eye **31** for receiving thread to be guided by the guide **16**.

In assembling the guide **16** in the jack **15** the upper part of the shank portion **27** is seated in the seat **21** with the slot **28** aligned with the slot **22**. The guide **16** is then rigidly secured to the jack **15** by means of a fastener, generally referred to by the numeral **32**. The fastener **32** may be provided with a rectangular head **33** and a stem **34**. The stem **34** is passed through the bore **23** and the head **33** is seated firmly in the aligned slots **22** and **28** in the manner best shown in FIGURE 5. The stem **34** extends through the leg **18** and the end thereof remote from the head **33** is upset, as at **35**, to securely, yet replaceably, secure the guide **16** to the jack **15**.

With respect to the replaceability of the guide **16** it is pointed out that in the event the guide **16** should become broken or otherwise damaged, it is merely necessary to knock out the rivet **32** and to replace the rivet with another rivet after a new guide **16** has been assembled with the jack **15**. This is highly desirable due to the expense of the specially formed jack **15**.

Making reference to FIGURE 1, first, it will be seen that due to the fact that the plate-like portion **19** is centrally located with respect to the remainder of the jack **15**, the same jack **15** may be associated with either a left hand guide bar, such as the guide bar **10**, or a right hand guide bar, such as the guide bar **11**. Accordingly, only one guide unit **14** is required for the two different types of guide bars **10** and **11**.

Referring now to FIGURES 2 and 3, it will be seen that when the pattern guide unit **14** is mounted as is shown in FIGURE 2, it may be considered a left hand guide unit due to the fact that the guide **16** is displaced to the left of the vertical center of the jack **15**. On the other hand, the same pattern guide unit **14** may be rotated 180 degrees about its vertical center and again secured to the pattern guide bar **11** in the manner shown in FIGURE 3. The pattern guide unit **14**, as mounted in FIGURE 3, is now a right hand unit in that the guide **16** thereof is displaced to the right of the vertical center of the jack **15**.

From the foregoing, it will be readily apparent that the jack **15** of the guide unit **14** is constructed wherein it may be utilized with either left- or right-hand guide bars, and may assume either left- or right-hand positions on a single guide bar. Thus, the guide unit **14** is of universal application. In addition, because of the fact that the plate-like portion **19** of the jack **15** is provided with the elongated slot **24**, the guide unit **14** may be shifted relative to the guide bar **11** so that the fastener **26** does not assume a centered position, but may be offset from the center of the jack **15** a distance at least equal to the amount the guide **16** is offset from the vertical center of the jack **15**. In this manner, the guide unit **14** may be shifted with respect to the associated guide bar **11** a distance such that the guide **16** may assume any desired position between a centered position and a position disposed twice the distance of the spacing of the guide **16** from the vertical center of the jack **15**. In this manner, the guide unit **14** may obtain substantially any position desired for the same.

Reference is now made to FIGURES 7 and 8 wherein there is illustrated a modified form of pattern guide unit, generally referred to by the numeral **40**. The pattern guide unit **40** includes a jack, generally referred to by the numeral **41**, and a pair of the guides **16**. The jack **41** differs from the jack **15** primarily in the construction of the lower portion thereof. The jack **41** includes an upper plate-like portion **42** which corresponds to the plate-like portion **19** and which is provided with a slot **43** corresponding to the slot **24**, whereby the jack **41** may be mounted in the same manner as is the jack **15** and shifted laterally of an associated guide bar.

The jack **41** differs from the jack **15** in that in lieu of the depending leg **18**, the jack **41** has a thickened lower portion **45** of the same width as the upper portion thereof. The thickened lower portion **45** is provided with two spaced parallel vertically extending seats **46** each of which corresponds to the seat **21** and in which there is seated the shank portions **27** of the guides **16**. The face of the thickened lower portion **45** in which the seats **46** are formed is also provided with a transversely extending slot **47**. The slot **47** corresponds to the slot **22**, but extends the full width of the lower portion **45**. Bores **48** open from the bottom of the slot **47** through the thickened portion **45**. Fasteners **32** are seated in the slot **47** and the corresponding slots **28** of the guides **16** and replaceably secure the guides **16** in the jack **41**.

At this time, it is pointed out that the construction of the jack **41** is such that the guide units **40** may be mounted on left and right guide bars, such as the guide bars **10** and **11**. It is also to be noted that the guide unit **40** may be shifted laterally of its respective guide bar **10** or **11** due to the provision of the elongated slot **43**. While the guide unit **40** may be reversibly mounted on the same guide bar, this is not necessary when the guides **16** thereof are symmetrically arranged, as is shown in

FIGURE 7. However, it is possible to mount the guides **16** in off-center relation with the result that it may be desirable to reverse the guide unit **40** on a particular guide bar, as is generally shown in FIGURE 3 with respect to the guide unit **14**.

It is also pointed out that although the guide unit **40** of FIGURES 7 and 8 is illustrated as containing only two guides **16**, the jack **41** or a similar jack may be formed with three or more seats for receiving three or more guides. A typical jack specifically adapted for carrying the three guides is shown in FIGURE 9, the jack being generally referred to by the numeral **50**. The jack **50** has a thickened lower portion **51** which terminates in an integral upper plate-like portion **52** having an elongated transverse slot **53** formed therein, the slot **53** corresponding to the slots **24** and **43**. The extreme lower part of the lower portion **51** is provided with a rabbet **54** in one face thereof for receiving a clamping bar **55**. The lower portion **51** is provided with a plurality of vertical slots **56** which extend upwardly from the bottom of the lower portion **51** to points adjacent the intersection between the lower portion **51** and the upper portion **52**. The slots **56** are intended to receive the upper portions of guides, such as the guides **16**.

The lower part of the lower portion **51**, that is the part having the rabbet **54**, is provided with a plurality of holes **57** through which suitable fasteners **58** may pass. The bar **55** is provided with holes **59** which are aligned with the holes **57** and also through which the fasteners **58** may pass.

At this time it is pointed out that only one fastener **58** is illustrated, but that there will be a fastener for each of the holes **57**. The fastener illustrated is a rivet although in accordance with the invention the fasteners could be in the form of nut and bolt assemblies, or the fastener could be integral parts of the bar **55**. After the guides **16** have been positioned in the slots **56**, the bar **55** is applied, with the bar **55** being seated in the slots **28** of the guides **16** to not only serve to clamp the guides **16** in the slots **56**, but to also prevent axial movement of the guide **16** out of the slots **56**.

It is to be noted that two of the slots **56** are centered with respect to the vertical center of the jack **50** and that the third slot **56** is disposed in off-center relation. The jack **50**, as illustrated in FIGURE 9, is a left-hand jack. However, if the jack **50** is rotated **180** degrees about a vertical axis from the position shown in FIGURE 9, the off-center slot **56** will be disposed to the right and the jack **50** now becomes a right-hand jack. The jack **50** may be equally as well mounted in the right-hand or left-hand relationship in view of the fact that the upper portion **52** is of a reduced thickness and is centered with respect to the lower portion **51**.

At this time it is pointed out that although a bar has been illustrated as a securing means for the guide **16** carried by the jack **50**, and head fasteners have been illustrated as the securing means for the guides carried by the jack **41**, it is to be understood that the invention is not so restricted in that a bar-type fastener could be associated equally as well with the jack **41**, particularly in view of the provision of the elongated slot **47**, and head fasteners could be used with the jack **50**, in lieu of the bar **55**. It is also to be understood that the guide arrangements of FIGURES 7 and 9 are only two of the possible multiple guide arrangements, and that other jacks utilizing the principles of this invention may be provided with slots for receiving any desired number of guides in any desired centered or off-center relationship.

From the foregoing, it will be seen that novel and advantageous provision has been made for carrying out the desired end. However, attention is directed to the fact that other variations may be made in the example forms of the invention disclosed herein without departing from the spirit and scope of the invention, as defined in the appended claims.

What is claimed as new:

1. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack having an elongated slot therein defining a seat and said guide having a shank portion seated in said seat, and a replaceable fastener releasably securing said guide to said jack for replacement, said jack having a slot therein extending transversely of said seat and opening thereinto, said guide shank portion having a slot therein aligned with said jack slot, and said fastener having an enlarged head seated in said jack slot and said guide slot whereby movement of said guide relative to said jack is prevented.

2. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack having a seat and said guide having a shank portion seated on said seat, and a replaceable fastener releasably securing said guide to said jack for replacement, said guide being offset to one side of the center of said jack whereby the guide unit may be rotated 180 degrees about the center of said jack to offset said guide to the opposite side of the center of said jack to thus permit a single guide unit to be used as both a left-hand and a right-hand unit.

3. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack having a seat and said guide having a shank portion seated on said seat, and a replaceable fastener releasably securing said guide to said jack for replacement, said jack including a plate-like upper mounting portion of a thickness less than the thickness of the remainder of the jack and being centered on a vertical axis through a transverse section of said jack whereby said guide unit may equally as well be mounted on oppositely facing supports.

4. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack having a seat and said guide having a shank portion seated on said seat, and a replaceable fastener releasably securing said guide to said jack for replacement, said jack including an upper mounting portion and a lower depending portion and said seat being formed in said lower depending portion, said upper mounting portion being of an inverted T-section including a centered plate like upper part whereby said guide unit may equally as well be mounted on oppositely facing supports.

5. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack having a plate-like upper mounting portion of a thickness less than the thickness of the remainder of the jack and being centered on a vertical axis through a transverse section of said jack whereby said guide unit may equally as well be mounted on oppositely facing supports.

6. The guide unit of claim **5** wherein said guide is offset to one side of the center of said jack whereby the guide unit may be rotated 180 degrees about the center of said jack to offset said guide to the opposite side of the center of said jack to thus permit a single guide unit to be used as both a left-hand and a right-hand unit.

7. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack including an upper mounting portion and a lower depending portion lying generally in a common plane, said guide being carried by said lower depending portion and said guide being offset to one side of the center of said jack whereby the guide unit may be rotated 180 degrees about the center of said jack to offset said guide to the opposite side of the center of said jack to thus permit a single guide unit to be used as both a left-hand and a right-hand unit.

8. The guide unit of claim **5** wherein said guide is offset to one side of the center of said jack whereby the guide unit may be rotated 180 degrees about the center of said jack to offset said guide to the opposite side of the center of said jack to thus permit a single guide unit to be used as both a left-hand and a right-hand unit, and said upper mounting portion being of an inverted T-

section including a centered plate like upper part whereby said guide unit may equally as well be mounted on oppositely facing supports.

9. A pattern thread guide unit for knitting machines comprising a guide jack and a guide carried by said jack, said jack including an upper mounting portion and a lower depending portion, said guide being carried by said lower depending portion, and said upper mounting portion being of an inverted T-section including a centered plate like upper part whereby said guide unit may equally as well be mounted on opposite facing supports.

References Cited by the Examiner

UNITED STATES PATENTS

2,214,372	9/1940	Held	66—126
2,293,123	8/1942	Erdman et al.	66—86
2,428,448	10/1947	Broberg	66—86
2,429,231	10/1947	Lambach	66—86
2,690,066	9/1954	Schoenster	66—86
2,759,344	8/1956	Clark et al.	66—84
2,962,883	12/1960	Dolinsky	66—86
3,044,283	7/1962	Liebchen	66—86

FOREIGN PATENTS

1,126,702	7/1956	France.

DONALD W. PARKER, *Primary Examiner.*

RUSSELL C. MADER, *Examiner.*

J. H. LACHEEN, R. FELDBAUM, *Assistant Examiners.*