Oct. 15, 1957 J. J. McDONOUGH 2,809,508

TRANSFER JACK ASSEMBLY FOR USE IN A CIRCULAR KNITTING MACHINE

Filed June 6, 1956

Fig. 1.

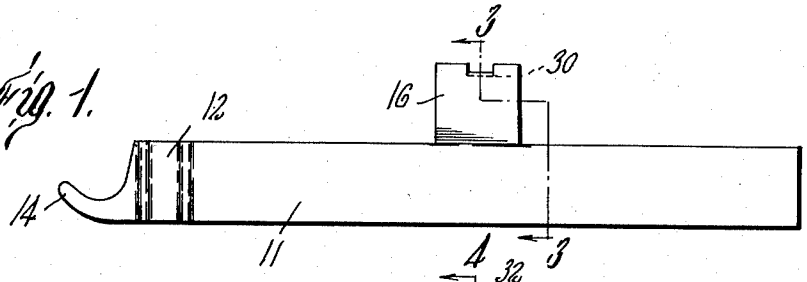
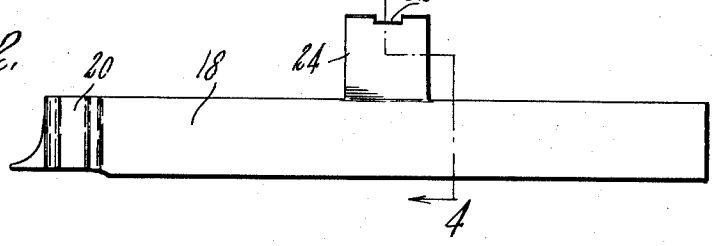


Fig. 2.



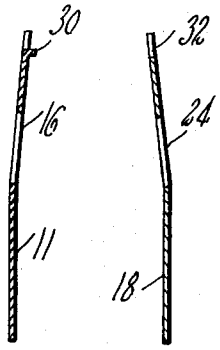


Fig. 3.

Fig. 4.

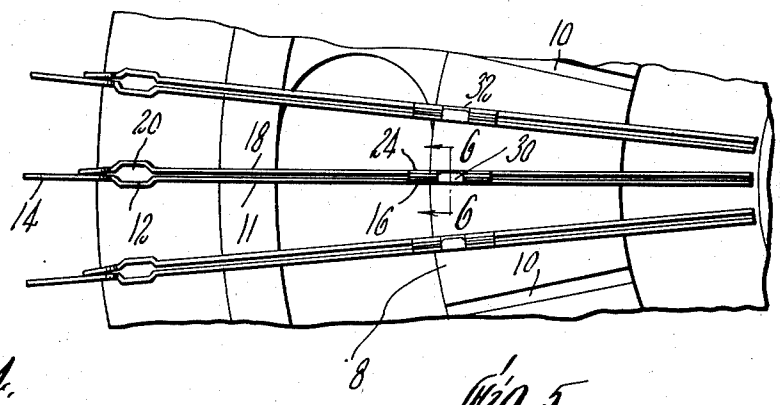


Fig. 5.

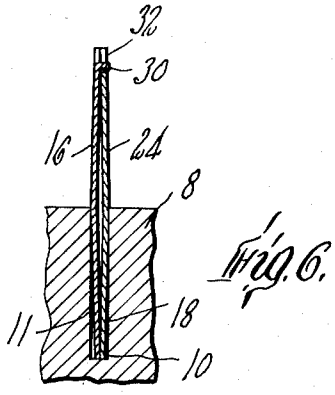


Fig. 6.

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United States Patent Office

2,809,508

Patented Oct. 15, 1957

2,809,508

TRANSFER JACK ASSEMBLY FOR USE IN A CIRCULAR KNITTING MACHINE

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Application June 6, 1956, Serial No. 589,619

7 Claims. (Cl. 66—95)

The present invention relates to an improved transfer jack assembly for use in a circular knitting machine.

The invention is herein disclosed as embodied in a 3¾" 400 needle, 75 gauge circular knitting machine adapted for the knitting of fine gauge women's hosiery, said machine being provided with a welt transfer mechanism including a slotted transfer dial in which are mounted radially disposed transfer jacks adapted to take and hold a course of loops while a fold of fabric is being knitted and then transfer them to the needles for the formation of an inturned welt.

While jacks constructed in accordance with the invention are particularly adapted for use in fine gauge hosiery machines of the type shown it will be understood that the invention in its broader aspects is not limited thereto but is applied equally well to the construction and operation of jacks for other purposes as found for example in the U. S. patent to Swinglehurst No. 1,912,320.

In machines of the general type described, for example in the R. W. Scott patent 1,282,958, which have been adapted for the knitting of progressively finer gauge hosiery, and in which the individual knitting instrumentalities are made of correspondingly finer gauge, a demand has arisen for improvement both in the construction and in the operating characteristics of the individual implements.

It is an object of the present invention to provide an improved transfer jack assembly having cooperating jack elements which are of simple and improved construction, and which are sprung with relation to one another in a novel manner so that they will act against one another and against the sides of the supporting dial slots to produce a more constantly and highly dependable frictional resistance for controlling the movement of the jack assembly, and so that they will be guided with improved efficiency in the dial slots to maintain an accurate alignment of the jack assembly at all times with relation to the cooperating knitting instrumentalities.

It is more specifically an object of the invention to provide an improved transfer jack assembly which is of simple and sturdy construction, is readily assembled in the slots of a fine gauge transfer dial, and is well adapted for continuous dependable operation in a high speed fine gauge machine.

It is another object of the invention to provide a novel device for securing together the two cooperating elements of each jack assembly which are formed individually from thin elongated flat stock.

A feature of the invention consists in the provision of a pair of jacks having flat elongated body portions with parallel edges arranged in facing relation with corresponding portions offset to provide a needle-receiving well, at least one of said jacks having an upwardly sloping point beyond the well, said jacks having formed on adjacent edges similarly shaped butts disposed in facing relation, in which the two butts are bowed with relation to the elongated flat body portions of the jacks in opposite directions toward one another so that the upper

ends of the butts are engaged and tend to force the jacks yieldably apart along their upper edges, thus producing a friction between the outer faces of the elongated body portions and the edges of the dial slot in which the jacks are mounted which extends along substantially the entire length of each jack member.

Further features of the invention consist in the provision of a novel means for securing together the two jack elements of each pair, for this purpose an offset being formed in the upper edge of one of the butts to engage with a corresponding recess in the upper edge of the other butt, thus providing an interlocking connection.

In the drawings:

Fig. 1 is a view in side elevation of the transfer jack constructed in accordance with the present invention;

Fig. 2 is a view similar to Fig. 1 of the associated jack of a pair forming a jack assembly;

Figs. 3 and 4 are sectional views taken on lines 3—3 and 4—4 of Figs. 1 and 2 respectively, but to a larger scale;

Fig. 5 is a plan view of a segment of the dial showing three transfer jack assemblies in position in the dial slots; and

Fig. 6 is a sectional view to a larger scale of the jack assembly on a vertical plane passing through the butts being generally in the position indicated by line 6—6 of Fig. 5.

Referring to the drawings, a section of a transfer dial 8 is shown which may be of ordinary construction having formed therein a series of radial slots 10. A transfer jack assembly comprising a mating pair of transfer jacks is slidably mounted in each slot. The transfer dial and jack assemblies supported therein are mounted concentrically with and slightly above the needle cylinder. The jack 11 shown in Fig. 1 consists of an elongated flat body portion which is of a thinness which may be in the order of .006 inch with parallel edges, having adjacent one end a laterally offset portion 12 which forms with an oppositely offset portion in the associated jack of the pair, a needle-receiving well, and is formed at its end beyond the well with an upwardly sloping welt transfer hook 14. The jack 11 is further provided intermediate its length with an upwardly extending butt 16. The other jack of the pair, specifically illustrated in Fig. 2 and designated at 18, is similarly formed with a flat elongated body portion having formed therein an offset 20 which cooperates with the offset portion 12 of the jack 11 to form the usual needle-receiving well, and at its outer end is tapered off to a point at substantially the bottom level of the jack. This jack may alternatively be provided with an upwardly sloping hook shaped like hook 14. The jack 18 is also provided with an upwardly extending butt 24 which is in facing relation to the butt 16. The butts 16 and 24 serve to move the jacks radially through the action of appropriate cams. The two jacks are substantially identical in outline except for the absence of a hook on the jack 18, and move as a single unit in their slot 10.

A feature of the invention consists in a novel manner of springing the two jacks with relation to one another to obtain a friction engagement between the jack assembly and the slot in which it rides. In the illustrated construction each of the two butts 16 and 24 are bowed toward one another so that the two jacks tend to be canted outwardly from one another about a pivotal axis extending along the bottom edge of the jack assembly. The two jacks 11 and 18 are thus held by spring pressure supplied by the bent butts 16 and 24 in frictional engagement with the sides of the slot 10 along substantially the entire length of each jack.

This arrangement has the substantial advantage of producing a firm and constant alignment of the jack assembly and more particularly of the needle well and hook portions thereof in the dial since the jacks are supported laterally at all times along the full length of that portion of each jack which is engaged with the supporting slot **10**. This construction has the further advantage that the frictional engagement between the jack elements and the sides of the slot is distributed over a maximum area so that a relatively light frictional pressure from the bent butts is sufficient to produce a substantial frictional resistance with a minimum of wear upon the transfer jack members and upon the sides of the slots engaged therewith. A frictional resistance applied in the manner above described is substantially unaffected by occasional gaps in the walls of the slots caused by the location of perforations or holes which may be formed in the dial for the purpose of blowing air through the dial. The relatively large area of friction contact between the jack elements of each transfer jack assembly and the sides of the supporting slot **10** tends also to minimize any variations in the amount of pressure produced by the bending of the jack butts, which might be caused by inaccuracies in the manufacture of these extremely small, very thin implements.

A further feature of the invention consists in the provision of a novel device for securing together the two cooperating jack elements of the pair making up the jack assembly. To this end the top edge of the butt formed integrally with the top edge of one of the jacks of each pair is stamped or otherwise formed to provide an offset therein, which is adapted to fit into a corresponding recess stamped or otherwise formed in the top edge of the butt of the other jack of the transfer jack assembly. As shown in the drawings, the butt **16** of the jack **11**, particularly illustrated in Fig. 1, is formed in the middle portion of its upper edge with an offset **30** which is adapted for interlocking engagement with a corresponding recess **32** formed in the butt **24** of jack **18**, particularly illustrated in Fig. 2. The jacks may also be interlocked by means of a formed protrusion near the top of one butt engaging a matching hole in the mating butt, or by other similar means. When the two jacks **11** and **18** of the transfer jack assembly are mounted in position in their slot **10** as illustrated particularly in the sectional view, Fig. 6, the offset **30** is held in position in the recess **32**. The offset **30** and recess **32** when so held provide mating interlocking surfaces which form an interlocking connection between the two jacks **11** and **18** causing them to be moved at all times longitudinally as a single unit.

The invention having been described, what is claimed is:

1. A transfer jack assembly for use in a circular knitting machine, consisting of a pair of jacks having flat elongated body portions with parallel edges, arranged in facing relation and of substantially similar outline, with portions offset with relation to one another to provide a needle receiving well, at least one of said jacks having an upwardly sloping point beyond said well, and said jacks having similarly shaped butts disposed on adjacent edges of said body portions in facing relation and having the ends of said butts bowed inwardly into contact with one another to urge the jacks apart along their upper edges.

2. A transfer jack comprising one of a pair having a well and projecting elements forming an upwardly sloping point for use in a circular knitting machine, said jack comprising an elongated flat body member having an offset needle well forming portion toward one end of the jack and an element of said point beyond said offset portion, and with an upwardly extending butt formed on the upper edge of the jack bowed laterally toward the side of the jack remote from said offset.

3. In a knitting machine having a transfer dial with jack supporting slots, a transfer jack assembly, consisting of a pair of jacks, having flat elongated body portions of substantially similar outline, with portions offset to provide a needle receiving well, at least one of said body members having an upwardly sloping point beyond said well, and said body members having butts disposed on adjacent edges in facing relation and bowed to engage the end portions of said butts with one another to spread the body portions along their lengths and thereby to frictionally engage the two jacks against the two sides of a jack slot.

4. A transfer jack assembly for use in a circular knitting machine, consisting of a pair of jacks having flat elongated body portions of substantially similar outline, with corresponding portions offset from one another to provide a needle receiving well, at least one of said body members having an upwardly sloping point beyond said well, said body members having similarly shaped butts disposed in facing relation, bowed to engage the end portions of said butts with one another to move the upper portions of the jacks apart along the length of the jacks, and means connecting said butts with one another thereby to move longitudinally connecting said jacks as a unit.

5. In a knitting machine having a transfer dial with jack supporting slots, a transfer jack assembly, consisting of a pair of jacks having flat elongated body portions of substantially similar outline, with corresponding portions offset in opposite directions to provide a needle receiving well, at least one of said jacks having an upwardly sloping point beyond said well, said jacks having butts disposed in engaging position, and bowed to engage the end portions of said butts with one another thereby frictionally engaging the two jacks against the sides of a jack slot, said butts at their upper edges having mating offset and recess surfaces which when said butts are held against one another provide interlocking surfaces connecting said jacks to move longitudinally as a unit.

6. A transfer jack assembly for use in a circular knitting machine consisting of a pair of jacks having flat elongated body portions with parallel edges and arranged in facing relation, said jacks having similarly shaped butts disposed in facing relation to one another and having the upper ends of said butts formed with mating offset and recess surfaces which when said butts are held against one another provide interlocking surfaces locking said jacks together to move longitudinally as a unit.

7. A transfer jack assembly for use in a circular knitting machine having jack supporting slots, consisting of a pair of jacks having flat elongated body portions with parallel edges arranged in facing relation and of substantially similar outline with portions offset with relation to one another to provide a needle receiving well, at least one of said jacks having an upwardly sloping point beyond said well, said jacks having formed on an edge of each jack similarly shaped butts disposed in facing relation and, a transverse section of each of said jacks including the butt being bowed, but in opposite directions to engage the upper ends of the butts and thereby to urge the jacks apart along their upper edges.

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