Sept. 2, 1952 K. G. STREW 2,608,725

SLIVER PIECING DEVICE

Filed Oct. 6, 1950 2 SHEETS—SHEET 1

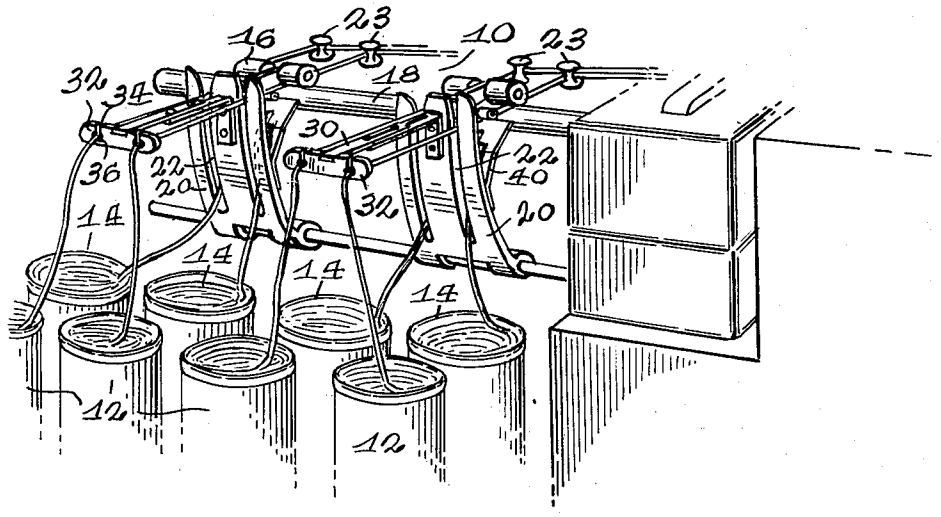


Fig. 1

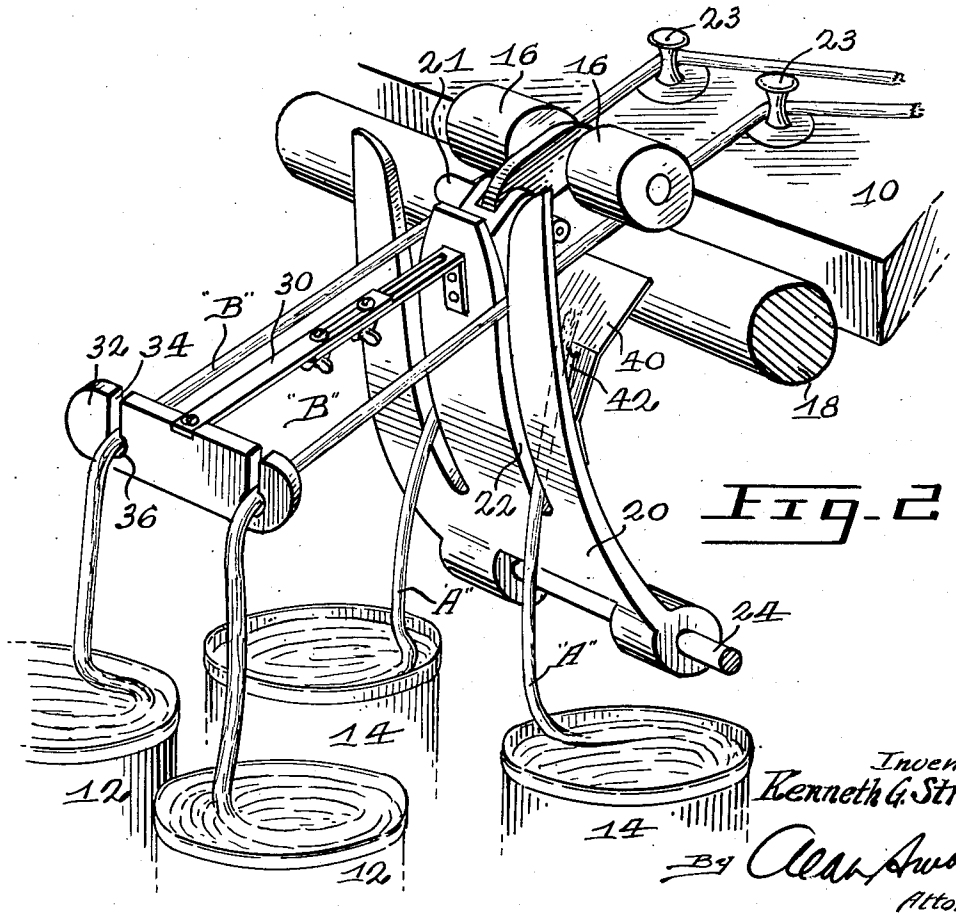


Fig. 2

Inventor
Kenneth G. Strew
By Alan Swabey
Attorney

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SLIVER PIECING DEVICE

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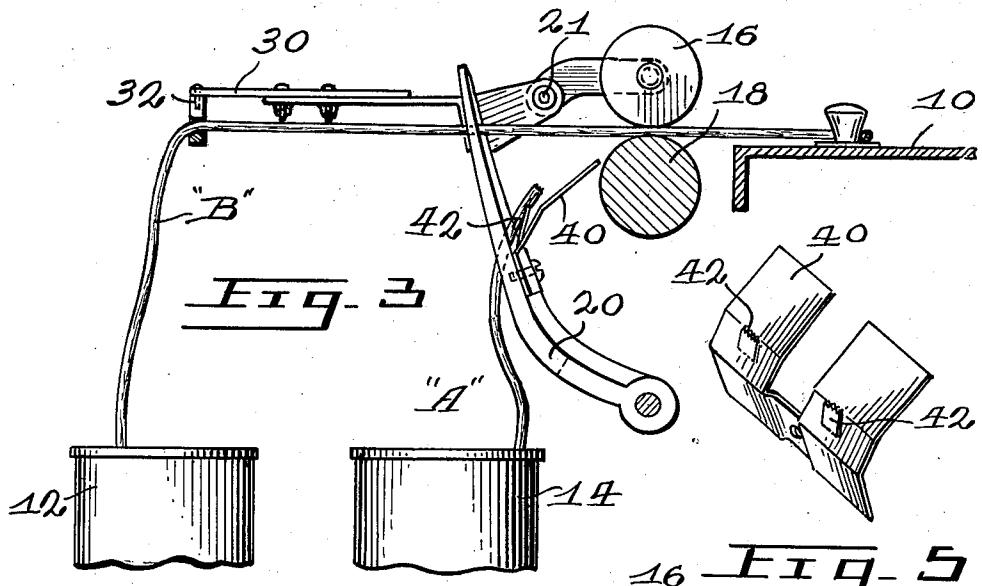


Fig. 3

Fig. 5

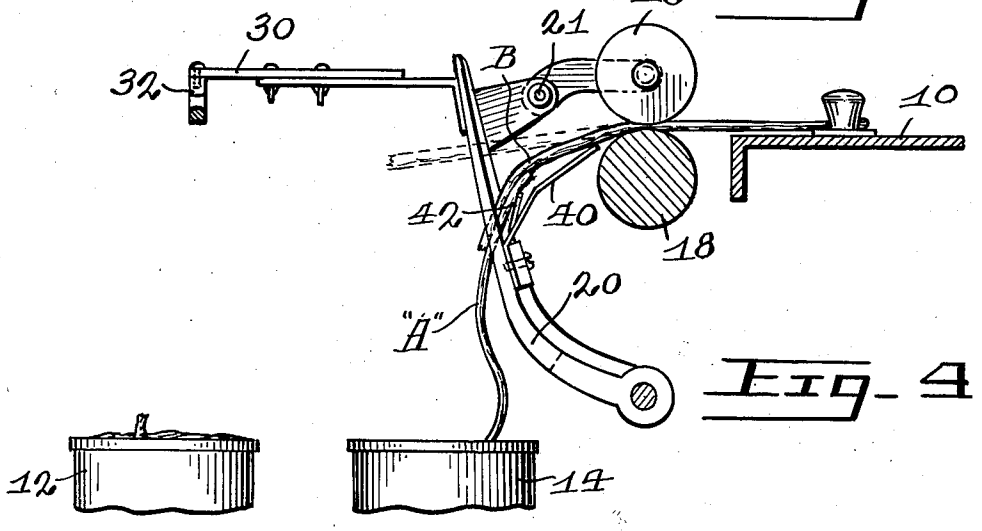


Fig. 4

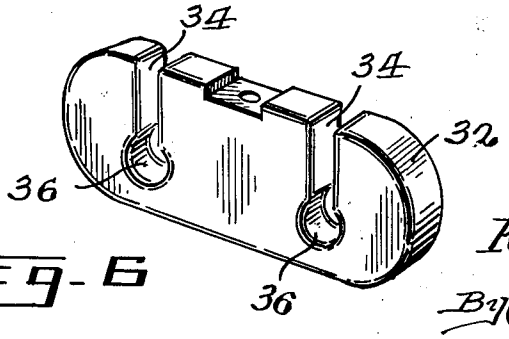


Fig. 6

Inventor
Kenneth G. Strew
By Alan Swabey
Attorney

Patented Sept. 2, 1952 2,608,725

UNITED STATES PATENT OFFICE

2,608,725

SLIVER PIECING DEVICE

Kenneth Gerald Strew, Sherbrooke, Quebec, Canada, assignor to Dominion Textile Company Limited, Montreal, Quebec, Canada, a corporation of Canada

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8 Claims. (Cl. 19—157)

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The present invention relates to textile apparatus and more particularly to textile machines of the type wherein a plurality of sliver ends are fed simultaneously into the machine for additional treatment, as for example, lap winders or drawing frames.

The usual practice in supplying sliver to these machines is to have at least one full reserve container of sliver positioned adjacent to each of the containers from which the sliver is being fed to the machine. With this arrangement, as soon as one container is emptied and the machine is stopped, a sliver end from the reserve supply can be pieced on and the machine restarted with as little delay as possible.

Attempts have been made to accomplish this piecing up operation mechanically without the necessity of stopping the machine, but to date, most of the apparatus designed for this purpose is of a complicated structure and consequently requires considerable modification of the machines to which they are installed.

The present invention recognizes these disadvantages and aims to provide a sliver piecing apparatus of simple design, having no moving parts, and which can be attached to the existing textile machines with a minimum of modification.

Accordingly, the present invention is a sliver piecing apparatus which, when embodied in combination with the existing sliver guiding means of a textile machine, is adapted to support the sliver ends being fed into the machine and additional reserve sliver ends in such a manner so that upon breakage or exhaustion of any of the feeding sliver ends, the reserve sliver ends are automatically picked up and fed into the machine.

More specifically, a preferred construction of a piecing apparatus constructed in accordance with the invention includes a supplementary sliver guide which is mounted in spaced apart relationship with the usual sliver guide of the machine, and a reserve sliver end retaining means, preferably sliver piercing points, positioned beneath the usual travel of the feeding sliver end. With this arrangement, the breakage or exhaustion of any of the sliver feeding ends causes the free end to fall from the extended supplementary sliver guide and to be guided into overlapping splicing contact with the reserve sliver end suspended on the reserve retaining means so that the reserve sliver end is disengaged from the retaining means and drawn into the machine without stopping the forward travel of the feeding sliver end.

In one preferred construction, the supplementary sliver guide is mounted on an elongated adjustable bracket extending from the machine adjacent to the existing sliver guiding means so that the distance between the supplementary sliver guide and the existing sliver guiding means can be varied so as to regulate the length of the feeding sliver end coming into overlapping contact with the reserve sliver end. The reserve sliver retaining means is positioned relative to the existing sliver guiding means so that the falling free end of the broken or exhausted sliver will be guided directly into contact with the reserve end at approximately the lowest point of its downward movement. This ensures that the overlapping contact between the exhausted feeding sliver end and the reserve sliver end is made when the two ends are positioned at an acute angle relative to the normal travel of the sliver. This positioning together with the forward motion of the feeding end gives the wiping contact necessary to piece together the feeding and reserve ends of sliver. It has been found on experiment that once the pieced ends have travelled through the entry rolls and have undergone the slight drawing action usually performed by the feeding mechanism of a lap winder, or a drawing frame, that the overlapped splice is blended, and the overall diameter of the sliver at that point is not considerably greater than the unspliced portion of the sliver.

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Detailed description

Having thus generally described the nature of the invention particular reference will be made to the accompanying drawings illustrating a preferred embodiment, and in which:

Figure 1 is a diagrammatic illustration of a portion of the sliver end feeding mechanism of a lap winder embodying a sliver piecing apparatus constructed in accordance with the invention.

Figure 2 is an enlarged diagrammatic view of a portion of the apparatus shown in Figure 1 to illustrate the construction in more detail.

Figure 3 is a side elevation, partially in section, of the apparatus shown in Figure 2 to illustrate more clearly the arrangement of the feeding sliver ends, the reserve sliver ends, and the relative position of the sliver piecing apparatus as it may be attached to the existing sliver end guides and feeding entry rolls of a lap winder.

Figure 4 is a side elevation, partially in section, corresponding to Figure 3 showing the apparatus in operation after the breakage of a feeding sliver end.

Figure 5 is an enlarged detail view in perspec-

tive elevation of a reserve sliver support member constructed in accordance with the invention.

Figure 6 is an enlarged detail view in perspective elevation of a preferred construction of a supplementary sliver guide.

The lap winders in general use are constructed so as to simultaneously handle a plurality of ends of sliver which are fed from supply cans disposed at each side of the machine. The sliver ends are fed from the supply cans on to a tapered table in staggered sequence so that the sliver ends from the furthest away or outside cans are fed down the centre of the table, the sliver ends from the next cans are fed into the machine at each side of the centre slivers and so on.

A portion of a machine of this nature is shown in Figure 1, wherein the table is designated as 10, the supply sliver cans 12 and the reserve sliver supply cans 14. The apparatus that controls the feeding of the sliver ends onto the table 10 at each position consists of a pair of pivotally mounted freely rotating shell rolls 16 which cooperate with a feeding roll 18 extending the length of the machine. The sliver ends are guided into the nip of the rolls 16, 18 by means of a sliver guide plate 20 which includes tapering slots 22 through which the sliver passes. As shown in detail in Figure 2, there is one such arrangement for each set of sliver cans, usually four (two feeding 12 and two reserve 14), at each side of the machine. The shell rolls 16 are pivotally mounted as indicated at 21 to the guide plate 20. The guide plate 20 is supported by engagement with a supporting rod 24 which extends the length of the machine.

This apparatus is common to most lap winders and in general practice the sliver ends are fed directly from the two outside sliver supply cans 12 directly through the guide plate 20 and as these are in alignment with the respective rolls 16, 18 the sliver is thus maintained in alignment with the sliver studs 23 of the lap winder. When the sliver end feeding from the outside supply cans 12 is exhausted or broken the machine is automatically stopped. The sliver end from one of the inner reserve cans 14 is then spliced by hand to the feeding end and the machine is restarted to continue with the operation.

The present invention is designed to eliminate this stoppage and provides an automatic piecing up apparatus for this purpose that includes an adjustable support bar 30 which is secured to the guide plate 20 so as to support a supplementary sliver guide plate 32, in front of and in spaced apart relationship with the guide plate 20. The supplementary sliver guide 32 includes a pair of spaced apart slots 34 which terminate in circular guide openings 36 through which the supply sliver ends pass and are thus maintained in alignment with the guide slots 22 in the guide plate 20.

A reserve sliver end supporting bracket 40 is adjustably mounted on the rear face of the guide plate 20 by means of suitable screws. The supporting bracket 40 includes a pair of spaced apart sliver retaining points 42 which are positioned so as to each align with one of the slots 22 in the guide plate 20 when the bracket 40 is in position. With particular reference to Figure 5, the sliver retaining points 42 are constructed so as to pierce and retain the reserve sliver ends.

In operation, as illustrated in detail in Figures 3 and 4 the ends of the sliver "A" from each of the full sliver reserve cans 14 are each hooked onto one of the sliver retaining points 42 so that the ends "A" are suspended beneath and transversely to the travel of the feeding sliver ends. The sliver ends "B" fed into the machine from the supply cans 12 are engaged in the guiding openings 36 of the supplementary guide plate 32. When any of the sliver ends "B" from the supply cans 12 is depleted, or breaks before the can is empty, the free sliver end "B" falls between the guide slots 22 of the guide plate 20 against the sliver end "A" suspended from the sliver engaging points 42. Due to the forward travel of the sliver, the angle of engagement, and the particular characteristics of cotton fiber, the wiping or drawing of the free sliver end "B" against the sliver end "A" supported by the point 42 is sufficient to cause the two ends to unite and so the sliver end "A" from the full reserve can 14 is drawn from the retaining point 42, between the shell rolls 16 and feeding roll 18, and into the lap winder.

The amount of the overlap between the sliver ends "A" and "B" is controlled by the distance the supplementary sliver guide 32 is positioned away from the guide plate 20. As the supporting bar 30 for the sliver guide 32 is adjustable, this distance can be varied to secure the overlap desired.

With this arrangement, the operator can start his machine with two rows of full cans, setting up his outside supply cans 12 to first feed sliver into the machine. As the second reserve sliver cans 14 are picked up automatically by the present apparatus, he can at his leisure replace the empty cans. Then, by moving the reserve cans 14 to the outside position and placing the now feeding sliver ends "A" in the slots of the supplementary sliver guide 32, he can place new full reserve cans 14 in the inside position hooking the new reserve sliver ends to the sliver points 42 so that the machine may be kept in continuous operation.

While the present apparatus has been described and illustrated as being embodied in a lap winder it will be understood that this is illustrative only, and that apparatus of this nature could be installed in other textile machines of a similar type.

I claim:

1. In a textile machine of the type having multiple sliver feeding means and guiding means for directing the travel of each feeding sliver end into the machine, the combination with each of said sliver guiding means of a sliver piecing apparatus comprising, a supplementary sliver guide for each of said feeding sliver ends disposed in alignment with and in spaced apart relationship from said first named sliver guiding means, and reserve sliver end retaining means adapted to loosely retain a free reserve sliver end in fixed position beneath the normal travel of said feeding sliver and at a predetermined distance from said supplementary sliver guide, whereby upon breakage or exhaustion of said feeding sliver end, said released sliver end is adapted to gravitate from said supplementary sliver guide and come into overlapping splicing contact with said reserve sliver end so as to disengage said reserve sliver end from said reserve sliver retaining means and draw it into said machine.

2. In a textile machine as claimed in claim 1, werein the sliver piecing apparatus includes an elongated supporting member connected to each of said first named sliver guiding means, said supplementary sliver guide being mounted on the outer end of said elongated supporting member, said elongated supporting member being adjust-

able whereby the distance between said supplementary sliver guide and said first named sliver guiding means may be varied.

3. In a textile machine as claimed in claim 1, wherein said reserve sliver retaining means comprises a supporting bracket connected to each of said first named sliver guiding means, each of said supporting brackets having at least one sliver piercing point extending obliquely therefrom adapted to receive and retain a reserve sliver end.

4. In combination with a textile machine of the type including means for simultaneously moving a plurality of sliver ends through a set of sliver feeding rolls and guide plates for directing the travel of each of said moving sliver ends, a sliver piecing apparatus comprising, a supplementary sliver guide member disposed in front of and in spaced apart relationship with each of said first named sliver guide plates, a reserve sliver retaining member disposed adjacent to each of said first named sliver guide plates and beneath the normal travel of said feeding sliver ends, each of said reserve sliver retaining members being adapted to loosely retain a reserve sliver end in alignment with and in spaced apart relationship from said supplementary sliver guide members, whereby upon breakage or exhaustion of any of said feeding sliver ends said free sliver end is caused to gravitate from said supplementary guiding member and is directed into overlapping splicing contact with said reserve sliver end so as to disengage said reverse end from said retaining member and draw it into said machine.

5. A combination as claimed in claim 4, wherein said supplementary sliver guide members are each mounted on the outer end of an elongated adjustable supporting bracket with the other inner end of said bracket connected to one of said first named sliver guide plates, whereby the distance between said supplementary guide member and said first named sliver guide plate may be varied to regulate the length of released feeding sliver end coming into overlapping contact with said reserve sliver end upon breakage or exhaustion of said feeding sliver end.

6. In a textile machine as claimed in claim 4, wherein said reserve sliver retaining member comprises a supporting bracket mounted on each of said first named sliver guide plates, and there is at least one sliver piercing point mounted on and extending obliquely from said supporting bracket.

7. A sliver piecing apparatus adapted to be embodied in a textile machine having sliver feeding means and at least one associated guide member to direct the travel of sliver moved by said means, said sliver piecing apparatus comprising of an elongated adjustable suport member adapted for attachment to said sliver guide member so as to extend outwardly therefrom, a supplementary sliver guide plate having at least one sliver guiding recess mounted on said supporting member, and a reserve sliver supporting bracket including at least one sliver piercing point adapted for attachment to said first named sliver guide member beneath said supplementary sliver guide plate.

8. A method of piecing up sliver characterized by the steps of, placing a free leading end of sliver from a reserve supply in a first position for access of the tail end of a sliver feeding from a depleted supply, loosely retaining said reserve sliver end beneath and in alignment with the normal travel of said feeding sliver end, and causing said feeding sliver tail end on depletion or breakage to gravitate into overlapping wiping contact with said loosely retained reserve sliver leading end so that the feeding tail end adheres to the reserve lead end, and said reserve lead end is released from said retention and is drawn into the machine.

KENNETH GERALD STREW.

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