Nov. 23, 1954 R. J. DE LATHAUWER 2,694,838

DEFECTIVE WORK DETECTOR AND STOP MOTION FOR SLIVER PRODUCING MACHINES

Filed March 1, 1951

Fig. 1

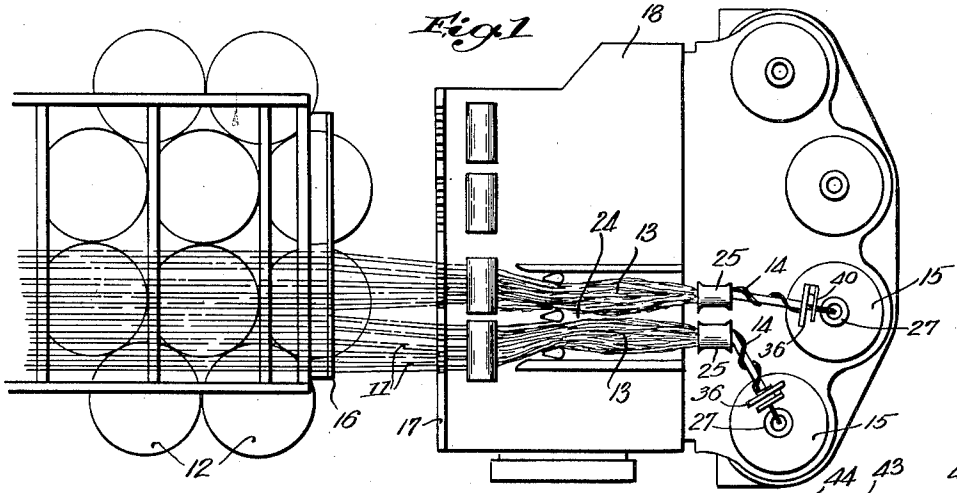


Fig. 3

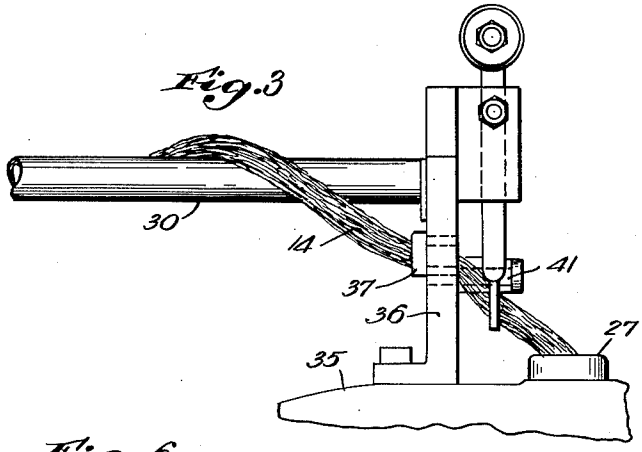


Fig. 4

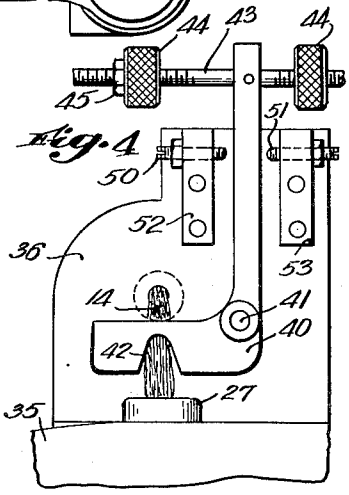


Fig. 6



Fig. 2

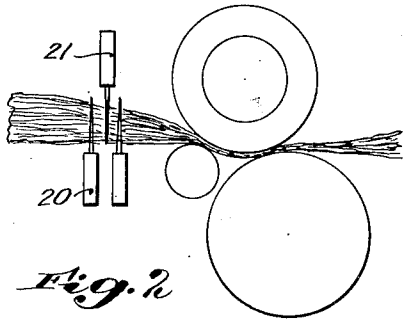
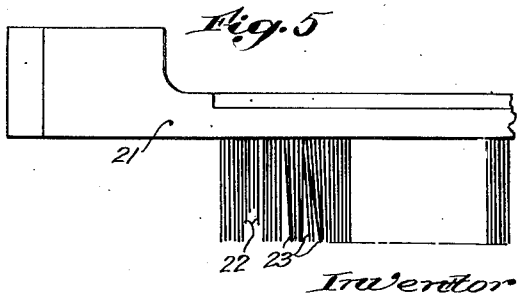


Fig. 5



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DEFECTIVE WORK DETECTOR AND STOP MOTION FOR SLIVER PRODUCING MACHINES

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4 Claims. (Cl. 19—165)

The present invention relates primarily to machines, sometimes known as pin drafters, which are used in the manufacture of woolen and worsted goods to combine a group of supply slivers into a single sliver, drafting it at the same time and coiling it in a can ready for subsequent further drawing or spinning. In machines of this type a group of supply slivers are withdrawn from supply cans, run through a gill box where the several slivers are combed and drafted by reciprocating combs and at the same time are converted into a single sliver. After passing through the gill box, the sliver is guided into a coiler head which coils it down in a can.

It has been found in the operation of such machines that frequently wide variations in the size of the sliver occur, the sliver being too thin in places and too thick in others. This can be due to a variety of causes. For instance, breakage of one of the group of supply slivers which are being consolidated into a single sliver; entanglement of stray fibers on the side of one sliver with those of an adjacent sliver so that one sliver increases in size at the expense of the adjacent sliver which is robbed; bent, broken or clogged combs or fallers in the gill box; clogged rollers, etc. Such defects show up in uneven or twitty sliver and cause delays, loss of time of machines and operators, defective yarn, and consequently defective or poor quality cloth and result in substantial losses.

Machines of this type are ordinarily equipped with a stop motion which stops the machine if a supply sliver breaks, the feelers of this stop-motion being ordinarily placed at the separator bar where the individual slivers enter the gill box. Such stop motions are effective to stop the machine if a supply sliver breaks before passing the feelers, but are ineffective to prevent the production of defective sliver by causes which take place thereafter.

At the present time there is nothing to stop the machine which operates on the sliver between the time when it enters the gill box and the time when it goes into the coiler head unless the sliver is completely broken or wrapped around the faller bars, but nothing to detect uneven, underweight, overweight or twitty slivers.

I have discovered that it is possible to prevent the production of these types of defective sliver by making simple modifications and additions to the ordinary drafting machine. Also I believe that my improved detector and stop motion are also applicable to other types of drafting machines which produce sliver under uniform tension.

Referring to the drawings:

Fig. 1 is a top plan view of the machine embodying my invention, portions only of the gill box being shown;

Fig. 2 is a view showing the arrangement of the combs and draft rollers in the gill box;

Fig. 3 is a side elevation of the guide, detector and part of the coiler head;

Fig. 4 is a view at right angles to the view of Fig. 3;

Fig. 5 illustrates a condition of combs in the gill box which is likely to cause defective silver, and

Fig. 6 shows a silver having thick and thin spots which result in defective yarn.

Referring now to the drawings and particularly Fig. 1 in which is shown a machine which withdraws groups of five supply slivers **11** from five supply cans **12** and combines each group of supply slivers **11** into a single sliver **13**, drawing it down to a small size as indicated at **14** and delivering it to coiler heads **15** which coil it down in suitable receiving cans, not shown. After being withdrawn from the supply cans **12**, the five slivers **11** pass between pins on a separator bar **16** and then between pins on the second separator bar **17**. Feelers of a stop motion, not shown, placed adjacent the separator bar **16**, stop the machine whenever any supply sliver breaks before it reaches the separator bar **17**. After passing the separator bar **17**, the five supply slivers enter the gill box **18** where they are combed and drawn by combs or fallers **20** and **21**, see Fig. 2, having both vertical and horizontal movements in the usual manner. The means for operating the fallers is not shown, since any standard mechanism may be employed. One of the combs **21** is shown in Fig. 5, some of the teeth **22** of this comb being broken and others **23** being bent out of normal position. Such combs produce uneven sliver. Also entanglement of fibers, for instance, at point **24** with fibers of the adjacent sliver **13** may pull a portion of the adjacent sliver **13** out of its path and rob the sliver of a part of the mass of fibers normally allotted to it. After leaving the gill box **18**, the slivers **13** pass through condensers **25**. At this time they are reduced in size and compacted and should be of uniform diameter throughout their length.

On leaving the condensers **25** the slivers **14** are guided to the eye **27** of the coiler head, see Figs. 1, 2 and 3, by means of a cylindrical rod or tube **30** around which the sliver passes in a spiral path. Any suitable guiding means may be used.

On the top of each coiler head **35** is a bracket **36** to which the guide **30** is secured. This bracket also contains an eye **37** by which the drawn down and condensed sliver **14** is guided into the coiler eye **27**. Between the eye **37** and the eye **27** the sliver is under substantially uniform tension. The bracket **36** carries a feeler **40** on a horizontal pivot **41**. This feeler **40** is in the shape of a bell crank having a horizontal and a vertical arm and is arranged to swing about the pivot **41**. The horizontal arm is provided with a notch **42** having a depth considerably greater than the diameter of the sliver passing through the notch. At the narrowest portion the notch has a width substantially equal to the desired diameter of the sliver and the sides of the notch flare outwardly and downwardly as shown in Fig. 3. At the upper end the feeler carries a rod **43** screw-threaded on its ends and provided with nuts **44**, **44** and if desired a check nut **45**. By moving one or both of the nuts **44** toward or away from the upper end of the feeler **40** the feeler can be balanced so that it will rest very gently on the sliver **14**. The bracket **36** is also provided with two contact points **50** and **51** which screw into blocks of insulation **52** and **53** and are thereby adjustable. These contact members **50** and **51** are connected to the motor relay, not shown, of the stop motion, so that whenever the feeler **40** touches one of the contacts **50** or **51**, the circuit is made through the relay and the motor which drives the machine is stopped.

The feeler **40** is adjusted so that when the sliver **14** passing the feeler is of the desired size, the vertical arm is midway between the two contacts **50** and **51**. If a bunch or enlarged portion in the sliver passes under the feeler **40** the horizontal arm is raised and the vertical arm brought in contact with the right hand contact **51**. Likewise, if there is a thin spot in the sliver the horizontal arm of the feeler **40** drops and the vertical arm is brought in contact with the other contact **50** also stopping the motor. Uneven or twitty yarn causes the vertical arm to flutter between the contacts and stop the machine if the unevenness becomes too great.

I find that the detector mechanism can be constructed and adjusted to be responsive to extremely small variations in size of the sliver and consequently yarn of a very uniform size can be produced.

After the machine has been stopped by the action of the detector mechanism, the operator can break out the defective portion of the sliver and reconnect the ends and can open the gill box and correct the cause of the trouble. Since the stop motion stops the machine almost instantly after the defective part of the sliver reaches the notch **42** in the feeler **40**, the length of defective sliver produced is extremely short and consequently waste is reduced to a minimum. The machine cannot be run

again until the defect is remedied since after being started, it will stop again as soon as the imperfection again reaches the detector **40**. The detector mechanism embodying my invention may be supplementary to the ordinary stop motion having feelers located adjacent the separator bar **16** and does not interfere with its operation, but, if desired, the stop motion may be dispensed with entirely since, if a supply sliver breaks, the size of the final sliver is reduced and the detector **40** will stop the machine as soon as the resulting thin place in the sliver reaches the detector.

I claim:

1. The stop motion and defective work detector for drafting machines which comprises means for combining and drafting a group of slivers in combination with a stop motion, two contacts and a pivoted detector provided with two arms, one of which is provided with an open substantially V-shaped notch embracing the sliver and resting thereon and the other of which is between the two contacts.

2. In a drafting machine, and in combination, a sliver size detector, and two contacts, said detector comprising a bell crank having two arms, one of which is substantially vertical and the other horizontal, the horizontal arm being provided with a notch and resting on the yarn and the vertical arm being located between the two contacts.

3. In a drafting machine, and in combination, a sliver size detector, and two contacts, said detector comprising a bell crank having two arms, one of which is substantially vertical and the other horizontal, the horizontal arm being provided with a notch and resting on the yarn and the vertical arm being located between the two contacts, and a movable weight on the vertical arm to balance the horizontal arm and position the vertical arm normally midway between the two contacts.

4. The defective work detector and stop-motion for drafting machines, which comprise a condenser through which the sliver passes on emerging from the drafting element to a coiler head, in combination with a feeler in contact with a sliver and resting thereon and located between the drafting elements and the coiler head and means actuated by the movement of the feeler to stop the machine when the maximum or minimum permissible size of the sliver is exceeded, said feeler having an open, condensing, and substantially Y-shaped notch therein, the narrowest part of the notch being of a size corresponding to the smallest permissible condensed diameter of the sliver and the widest part of the notch being of a size at least as great as the condensed diameter of the thickest permissible size of the sliver, said notch embracing the sliver and changing the position of the feeler as variations of size within the sliver occur.

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