

Feb. 8, 1938.

J. ELZER

2,107,818

TEXTILE DRAFTING APPARATUS

Filed May 8, 1936

2 Sheets-Sheet 1

Fig. 1.

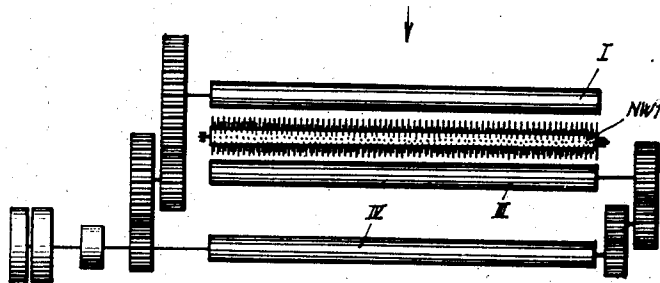


Fig. 2.

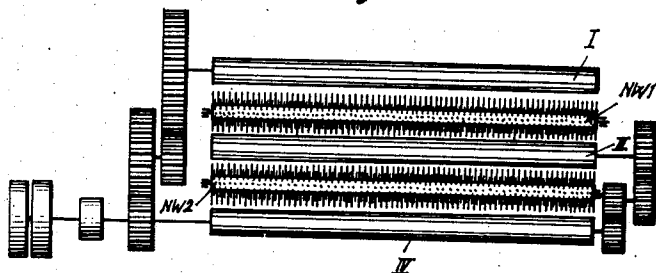
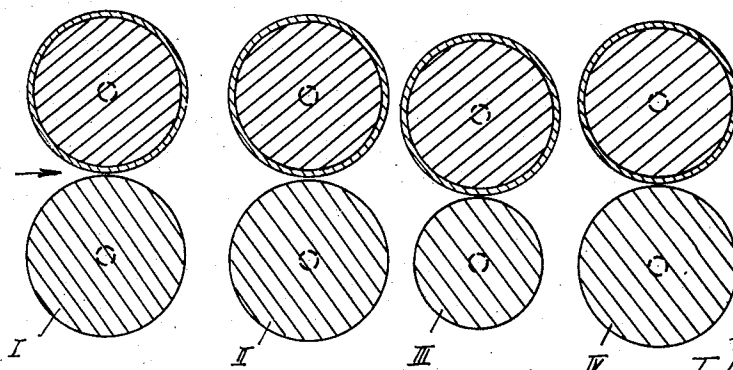


Fig. 3.



INVENTOR
J. ELZER
By *Alan H. H. H.*
ATTYS.

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J. ELZER

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Fig. 4.

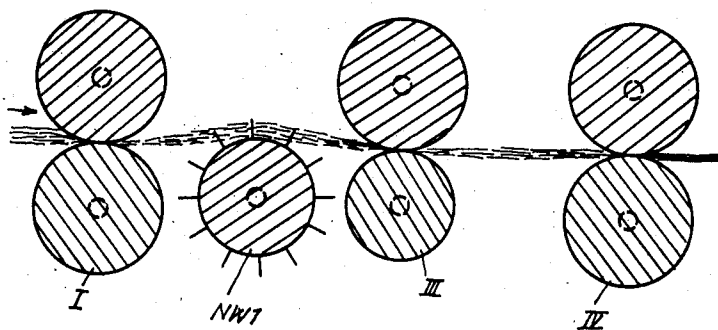
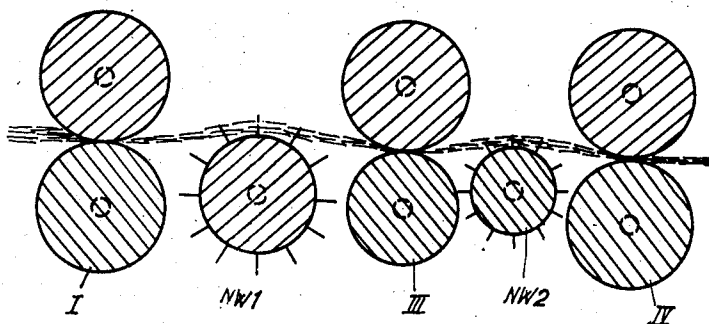


Fig. 5.



INVENTOR

J. ELZER

BY

Barth Kilbourn
ATTY'S.

UNITED STATES PATENT OFFICE

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TEXTILE DRAFTING APPARATUS

Johann Elzer, Mistek, Czechoslovakia

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5 Claims. (Cl. 19—130)

This invention relates to apparatus for drafting textile fibres having a relatively long staple such as wool or artificial silk and has for its object to provide improved apparatus for this purpose.

The spinning of wool in its original condition on cotton spinning machines of the ordinary type is not possible since wool in general has a much longer staple than cotton being generally from 60 to 70 mm. long and ordinary cotton spinning machines are designed to deal with fibres of considerably shorter length. Furthermore, and this is of essential importance in the preparation for spinning the drafting of wool (for instance by combing) presents difficulty owing to the strong adhesion of the separate fibres. If the length only of the wool fibres had to be contended with it would be possible, by suitable adjustment of the drafting rolls, to effect the necessary drafting, but owing to the adhesion above referred to whole bunches of wool fibres adhering together are found to be unavoidably torn out during the drafting or thinning from the aligning member (for instance the comb) which obviously causes thickening of the yarn and is of course very undesirable.

Similar conditions exist in the case of other long-staple fibrous materials, such as artificial silk having a fibre length of say 60 to 70 mm. or more and such materials cannot be spun on the cotton spinning machines hitherto in use.

Drafting apparatus is known in which rolls provided with projecting wires or needles are interposed between the drafting rolls for the purpose of avoiding the difficulties above explained, but all these special rolls were arranged to be positively driven and did not effect the desired result since they did not take account of the special nature of the fibre fleece. In some cases the needle rolls were provided with resilient needles or wires in order to avoid as much as possible the tearing out of bunches of fibres, which often occurred with rigid needles. But even these resilient needles did not work reliably and frequently tore out bunches of fibres.

The present invention avoids these disadvantages by providing drafting apparatus for spinning machines in which a needle roll interposed between the pairs of drafting rolls are arranged to be capable of free rotation and are driven only by the fibre fleece or band.

Owing to the fact that the needle rolls employed according to the present invention are arranged to rotate freely, their rotation being merely produced by the movement of the fibre

band or sliver, the tearing out of bunches of fibres from the band during drafting is avoided and furthermore, the freely rotatable needle rolls exert a relative braking action on the wool fibres.

The invention is illustrated by way of example in the accompanying drawings of which:

Figure 1 is a diagrammatic plan view of one form of drafting apparatus embodying the invention, Figure 2 being a similar view of a modification also embodying the invention.

Figure 3 is a diagrammatic view in end elevation of the usual roll arrangements in cotton drafting apparatus, Figures 4 and 5 being similar views corresponding to the forms of apparatus embodying the invention, shown in Figures 1 and 2 respectively.

Referring now to Figures 1, 3, and 4 it will be seen that the drafting apparatus for cotton spinning shown in Figure 3 is modified in accordance with the invention so as to be capable of drafting wool fibres in the manner shown in Figures 1 and 4 in that the rolls II of Figure 3 are replaced by a needle roll NW1. The needle roll NW1 is not positively driven and is so mounted as to engage with the fibre fleece or band at slightly above the level of contact of the rolls I, III, and IV which remain unaltered.

In operation the sliver or band is drawn along by the feed rolls I to the needle roll NW1 and subsequently gripped between the rolls III. By the drafting action between the rolls I and III the sliver or band is stretched, the needles on the needle roll NW1 piercing the band and the needle roll being rotated by the band. In this way a braking action is exerted on the wool fibres whereby bunches of fibres are prevented from being torn out during the drafting operation. Furthermore, a loosening and in particular a constrained guiding of the wool fibres is also effected, so that the drafting of the fleece between the rolls III and IV can be effected without difficulty. Since the needle roll is somewhat raised, the wool sliver as will be seen from Fig. 4 is bent upwards between the rolls I and III in passing over the needle roll NW1 instead of following a continuous straight line path. The operation of the apparatus is the same when treating other long-staple material such as natural or artificial silk having relatively long fibres.

A non-driven needle roll NW2 may also be interposed between the rolls III and IV as shown in Figures 2 and 5, the roll NW2 being also in a slightly raised position with the needles carried thereby penetrating the fibre band. This second

needle roll NW2 is carried along by the woolen thread band and performs the same action as the roll NW1 between the rolls I and III. Beyond the needle roll NW2 a pair of upper and lower
 5 rolls under free pressure may if desired be provided for guiding the wool fibres from the second needle roll NW2 to the rolls IV.

Any further drafting apparatus and in some cases other apparatus provided for example flyers, throstles and self-actors are arranged in a
 10 similar manner and are provided with needle rolls which are not positively driven.

It will be understood that the invention is not limited to the particular construction and arrangement of apparatus illustrated by way of example as applied to cotton drafting apparatus, but may also be applied to machines for drafting
 15 worsted or silk or other fibrous materials, and various modifications may be made therein within the scope of the appended claims.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:—

25 1. In textile drafting apparatus the combination of a plurality of sets of drafting rolls through which the sliver to be drafted passes in succession, and a needle roll interposed between two

adjacent sets of drafting rolls and rotatably driven by the sliver.

2. In textile drafting apparatus the combination of a plurality of sets of drafting rolls through which the sliver to be drafted passes in succession
 5 and a freely rotatable needle roll interposed between two adjacent sets of drafting rolls and engaging with and raising said sliver.

3. In textile drafting apparatus, the combination of at least three sets of drafting rolls through
 10 which the sliver to be drafted passes in succession, and a plurality of needle rolls, each interposed between two adjacent sets of drafting rolls and rotatably driven by the sliver.

4. In textile drafting apparatus, the combination of at least three sets of drafting rolls through
 15 which the sliver to be drafted passes in succession and at least two freely rotatable needle rolls each interposed between two adjacent sets of drafting rolls and engaging with and raising said sliver. 20

5. In textile drafting apparatus, the combination of at least three sets of drafting rolls through which the sliver to be drafted passes in succession, and a freely rotatable needle roll interposed between the first and second set of drafting rolls
 25 and engaging with and rotatably driven by said sliver.

JOHANN ELZER.