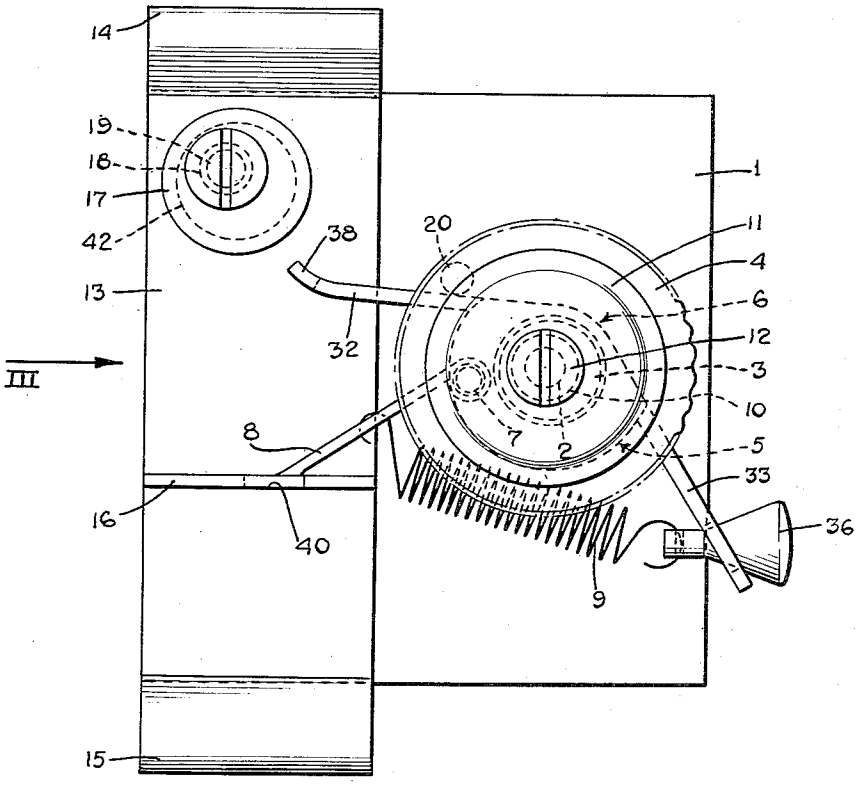
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YARN CLEARER

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Fig. 1.



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Fig. 2.

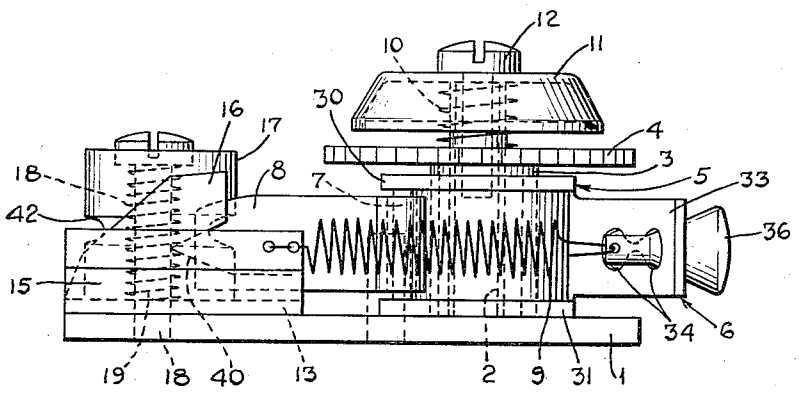
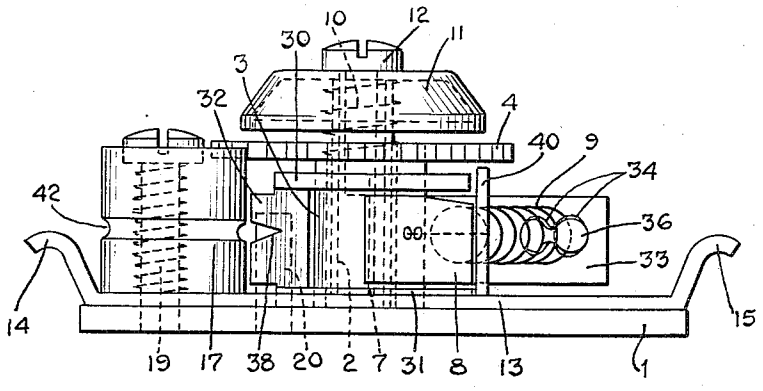


Fig. 3.



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YARN CLEARER

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8 Claims. (Cl. 28—64)

This invention relates to apparatus for use in the textile industry, and more particularly to yarn clearers for freeing yarn of any thicknesses and of material from adhering impurities and for removing thickenings, swellings, neps, protuberances or the like from such yarn.

An object of this invention is to provide a yarn clearer, by means of which an undesired passage of thickenings, swellings, neps or protuberances or the like of the yarn through the device is avoided and a breakage of the yarn is assured for removing such unevennesses from yarn, while on the other hand knots in the yarn may pass through the device without causing an action by the latter.

A further object of this invention is to provide a yarn clearer for use in conjunction with winding and twisting frames, by means of which an increase in the output is obtained in comparison with the output obtainable by winding or twisting frames equipped with hitherto customary yarn clearers.

Another object of the invention is to provide a yarn clearer which does not affect the quality and/or properties of the yarn or the fabric or articles made therefrom by failure to respond to flattened swellings in the yarn or the like.

A further object of the invention is to provide a yarn clearer, by means of which the quality of the yarn is substantially improved and a reduction in the expenses is obtained, as the time needed for performing the subsequent treatments of the raw product or finished product is considerably reduced.

Another object of the invention is to improve on the art of yarn clearers as now customarily made.

Further objects and structural details of the invention will be apparent from the following description when read in conjunction with the accompanying drawings wherein:

Fig. 1 is a top plan view of a yarn clearer according to the invention, and

Fig. 2 is a side elevational view of the yarn clearer shown in Fig. 1.

Fig. 3 is a side elevational view as seen in the direction of the arrow III of the device shown in Fig. 1.

Referring now to the drawings, 1 indicates a support or base plate of a yarn clearer according to the invention. An axle or stud 2 is mounted on said base plate 1 substantially in the center of the right hand portion thereof. The longitudinal axis of the axle 2 extends in vertical direction, perpendicular to the top surface of said plate 1. A sleeve 3 having an eccentrically arranged bore is rotatably mounted on said stud 2. A knurled disk 4 is secured to said sleeve 3 in any suitable manner. A segment 5 substantially in the shape of a partially cut-off roller having an upper wall 30 and a lower wall 31 is rotatably mounted on said sleeve 3. Said segment 5 is rigid with a controlling lever 6 having two flat arms 32 and 33 oriented at an angle of approximately 120° to each other.

A strip-like adjusting lever 8 is rotatably mounted on a vertical shaft 7 connected with the upper and lower walls 30 and 31 of the partially cut-off roller 5.

The ends of a return tension spring 9 are operatively connected with said strip-like lever 8 and the outwardly projecting arm 33 of the double-armed lever 6. Preferably, the arm 33 is provided with a series of apertures or similar longitudinally spaced attachment means 34 (see Fig. 2) for selective engagement with an element 36 connected with one end of the return spring 9, so that the tension of said return spring 9 may be readily adjusted.

The free end of the inwardly extending arm 32 of the double-armed lever 6 is slightly bent towards one of the edges of the device, specifically the edge shown at the upper part of Fig. 1. Said bent end of the arm 32 is provided with a wedge-like recess 38,

The ends of a compression spring 10 surrounding a portion of the stud 2 abut against the knurled disc 4 and a covering body or cap member 11. Said covering body 11 is connected with the stud 2 by means of a screw 12 in such a manner that the compression spring 10 arranged between the covering body 11 and the knurled disc 4 renders possible a rotation of the knurled disc 4 and the sleeve 3 connected therewith, whereby the levers 6 and 8 may be laterally displaced with respect to the stud 2.

The edges 14 and 15 of a metal sheet 13 forming a yarn guide arranged in the left hand portion of the device are bent upwardly, substantially perpendicular to the main plane of said metal sheet 13. Said edges 14 and 15 of the metal sheet or yarn guide 13, secured to the base plate 1 in any suitable manner, guide the yarn at a predetermined distance above the base plate 1. Preferably said edges 14 and 15 are curved.

A section of the yarn guide 13 is provided with a checking member 16 rigid with said yarn guide and arranged at a right angle to the base plate 1. Said checking member 16 has an opening in the shape of a wedge-like recess 40. Said recess 40 cooperates with the free end of the adjusting lever 8 which is in abutting engagement with said checking member 16, so as to form a limiting edge of an eye for the passage of the yarn.

Furthermore, a yarn guiding roller 17 having a guiding groove 42 and a knurled edge (not shown) is eccentrically mounted on a stud 18 secured to the base plate 1 between the edge 14 and the member 16 of the yarn guide 13. The eccentricity of the guiding roller 17 may be manually adjusted by a rotation of said guiding roller 17 around said stud 18 through the medium of a compression spring 19 arranged inside said guiding roller 17 on said stud 18.

Moreover, the base plate 1 carries in its right hand portion a limiting pin 20 disposed laterally of the stud 2, as viewed in Fig. 1; said pin 20 is arranged for limiting the stroke of the arm 32 of the bell-crank lever 6.

Preferably, all parts of the device subject to wear and tear by the passage of the yarn are chromium plated or made of glass.

The operation of the device is as follows:

The yarn runs over the edge 14 of the yarn guide 13, passes then through the groove 42 of the eccentrically mounted yarn guide roller 17, through the wedge-shaped recess 38 of the arm 32 of the bell-crank lever 6 and through the passage formed between the strip-shaped lever 8 and the wedge-shaped recess 40 of the member 16. The yarn then continues its path over the edge 15 of the yarn guide 13. Both, the yarn guide roller 17 and the passage formed between the lever 8 and the recess 40 of the member 16 are adjusted corresponding to the thickness of the yarn running through the device, by turning the knurled disc 4 connected with the sleeve 3 and the yarn guiding roller 17, respectively, in such a manner that the yarn may pass through the wedge-shaped recess 38 of the arm 32 of the lever 6 and a passage formed between the lever 8 and the recess 40 of the member 16,

the size of said last mentioned passage corresponding to the thickness of the yarn.

When protuberances, thickenings, swellings, neps or the like unevennesses are present on portions of the yarn passing through the device, the angularly bent lever 6 and, thus, also the strip-shaped lever 8 remain in their respective starting positions (as shown in Fig. 1), so that no increase in the opening of the passage formed between the lever 8 and the recess 40 of the member 16 occurs. Since due to the exact adjustment of the lever 8 corresponding to the thickness of the yarn, no thickening, swelling or the like of the yarn can pass through said passage, such thickenings or the like are obstructed in their path through the device and, accordingly, the yarn breaks. The operator, therefore, has no other way but to remove the thickened or otherwise uneven or impure portion from the broken yarn whereafter the operator ties the two ends of the broken yarn together by a standard knot and the operation is resumed. Thus, the impurity of the yarn is removed.

However, when there is a knot in a portion of the yarn passing through the device, the knot coming into engagement with the wedge-shaped recess 38 of the arm 32 of the lever 6 carries the lever 6 along, rotating same around the eccentric sleeve 3, until the arm 32 of the lever 6 reaches a position in front of the passage formed between the lever 8 and the recess 40 of the member 16. Due to said movement of the lever 6, the lever 8—in accordance with its mounting—is drawn rearwardly whereby the passage between this lever 8 and the recess 40 of the member 16 is enlarged which in turn results in the fact that the knot on the yarn, after sliding off the recessed extremity of the lever arm 32, can freely pass through the thus enlarged passage without causing a breakage of the yarn. When the knot has passed through the passage, the tension spring 9 stretched between the lever 8 and the arm 33 of the lever 6 draws the lever 6, and thus the lever 8 connected therewith, through the segment 5 and pin 7 back into their respective starting positions.

We have described a preferred embodiment of our invention, but it is understood that this disclosure is for the purpose of illustration, and that various omissions and changes in shape, proportion and arrangement of parts, as well as the substitution of equivalent elements for the arrangements shown and described may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What we claim is:

1. A yarn clearer for use in eliminating slubs and like relatively soft enlarged portions of more than a predetermined maximum thickness from yarn being checked while permitting relatively hard knots to remain in said yarn, comprising a base plate, a guide plate fixedly positioned on said base plate, a guide roller provided with a peripheral guide groove rotatably mounted on said guide plate, a checking member disposed on said guide plate and provided with a first wedge-shaped recess coacting with said groove of said guide roller to define a path of movement for said yarn over said guide plate, a mounting body rotatably arranged on said base plate laterally of said guide plate, a control lever provided with two arms oriented angularly with respect to one another, said control lever being fixedly connected intermediate its extremities to said mounting body for rotary movement therewith, one of said arms of said control lever extending toward said path and being provided in its free extremity with a second wedge-shaped recess intersecting said path at a location between said guide roller and said checking member, an adjustment member pivotally connected at one extremtiy to said mounting body laterally of the axis of rotation of the latter and having another extremity in engagement with said checking member for sliding movement therealong substantially transversely to said path and across said first wedge-shaped recess to define with the sides of the latter a variable-size, substantially triangular aperture, and tension spring means operatively interconnecting said adjustment member and the other of said arms of said control lever to draw said adjustment member against said checking member and bias said one arm of said control lever in the direction of said guide roller, thereby ensuring positioning of said mounting body so as to cause said adjustment member to impart to said aperture a predetermined minimum size facilitating catching and breaking of said yarn at said aperture due to appearance of slubs and like enlarged portions of greater thickness than said predetermined maximum, knots in said yarn when caught by said second wedge-shaped recess causing swinging of said one arm of said control lever toward said checking member against the force of said tension spring means and concurrent movement of said adjustment member along said checking member to enlarge the size of said aperture, whereby said knots upon slipping off said one arm of said control lever are enabled to pass through said aperture without engendering breaking of said yarn.

2. A yarn clearer according to claim 1, further comprising an axle projecting from said base plate, an eccentric sleeve rotatably mounted on said axle, said mounting body being carried by said sleeve for rotation therewith, and a knurled disc arranged on said sleeve, whereby upon rotation of said sleeve through the intermediary of said disc the initial positions of said control lever and said adjustment member may be adjusted.

3. A yarn clearer according to claim 2, further comprising a compression spring mounted on said knurled disc substantially coaxially with the latter, a cap member disposed above said compression spring, and a screw extending through said cap member and said spring and connected to said axle, whereby rotation of said cap member is transmitted to said disc by said compression spring.

4. A yarn clearer according to claim 3, further comprising an additional axle mounted on said guide plate, said guide roller being provided with an eccentric bore and mounted on said additional axle for eccentric rotation thereabout, and an additional compression spring arranged in said bore and surrounding said additional axle, whereby said guide roller may be rotated to and retained in a predetermined position on said guide plate.

5. A yarn clearer according to claim 4, said other arm of said control lever being provided with a plurality of longitudinally spaced attachment means for engagement by one end of said tension spring means, whereby the degree of extension of the latter between said adjustment member and said other arm of said control lever may be varied.

6. A yarn clearer according to claim 5, further comprising means on said base plate for limiting the extent of movement of said one arm of said control lever in the direction of said guide roller.

7. A yarn clearer for use in eliminating slubs and like relatively soft enlarged portions of more than a predetermined minimum size from yarn while permitting relatively hard knots to remain in said yarn, comprising a base plate, a guide member provided with a peripheral guide groove adjustably mounted on said base plate, a checking member disposed on said base plate and provided with a first wedge-shaped recess coacting with said groove of said guide member to define a path of movement for said yarn, a mounting body rotatably arranged on said base plate laterally of said guide member, a control lever provided with two arms oriented angularly to one another, said control lever being fixedly connected at the junction of said arms thereof to said mounting body for rotary movement therewith, one of said arms of said control lever extending toward said path and being provided in its free extremity with a second wedge-shaped recess intersecting said path at a location between said guide member and said checking member, an adjustment member pivotally connected at one extremity

to said mounting body laterally of the axis of rotation of the latter and having its other extremity in engagement with said checking member for sliding movement therealong substantially transversely to said path and across said first wedge-shaped recess to define with the sides of the latter a variable-size, substantially triangular aperture, and a tension spring operatively interconnecting said adjustment member and the other of said arms of said control lever, said tension spring drawing said adjustment member against said checking member and biasing said one arm of said control lever in the direction of said guide member, thereby ensuring positioning of said mounting body so as to cause said adjustment member to impart to said aperture a predetermined minimum size corresponding to the maximum permissible size of said slubs and like enlarged portions, knots in said yarn when caught by said second wedge-shaped recess causing swinging of said one arm of said control lever toward said checking member against the force of said tension spring and concurrent movement of said adjustment member along said checking member to enlarge the size of said aperture, whereby said knots upon slipping off said one arm of said control lever are enabled to pass freely through said aperture.

8. In a yarn clearing device; guide means defining a predetermined path of movement for yarn to be checked, first means defining a substantially triangular aperture intersecting said path, second means movable substantially longitudinally of said path toward and away from said first means and defining a wedge-shaped recess intersecting said path in advance of said aperture as viewed in the direction of movement of said yarn, third means operatively interconnecting said second means and a portion of said first means for enlarging said aperture in response to movement of said second means toward said first means and for narrowing said aperture in response to movement of said second means away from said first means, and resilient means operatively connected to both said second means and said portion of said first means for biasing said second means away from said first means and for thereby narrowing said aperture to a predetermined minimum size.

References Cited in the file of this patent

UNITED STATES PATENTS

1,026,907	Childs	May 21, 1912
2,732,610	Perry	Jan. 31, 1956

FOREIGN PATENTS

596,999	Great Britain	Jan. 15, 1948