Dec. 23, 1952 E. R. SWANSON 2,622,305

SLUB CATCHER OR YARN CLEANER

Filed March 10, 1948 2 SHEETS—SHEET 1

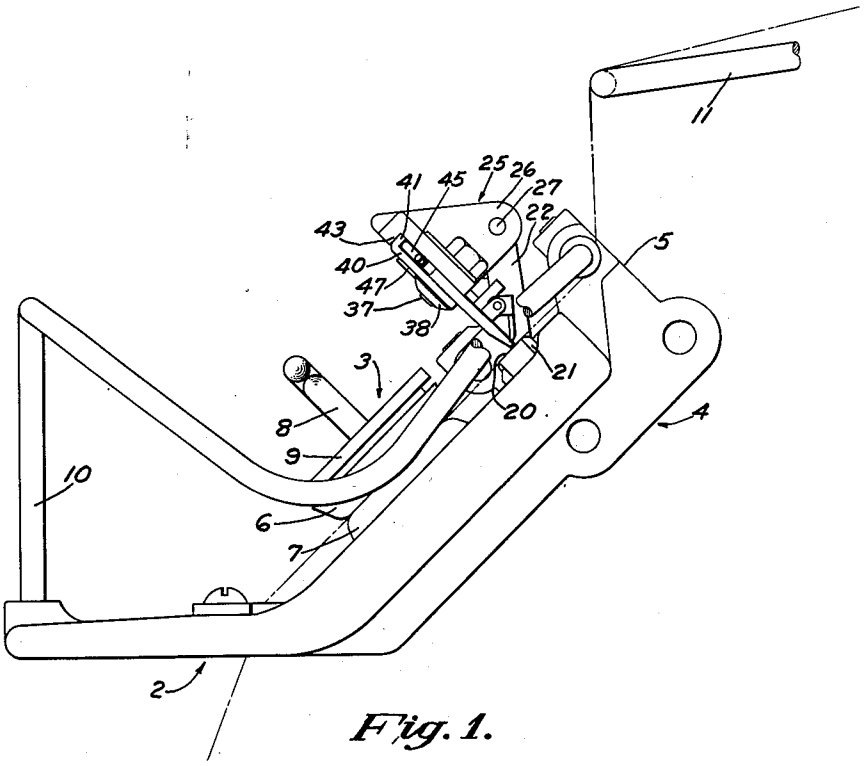


Fig. 1.

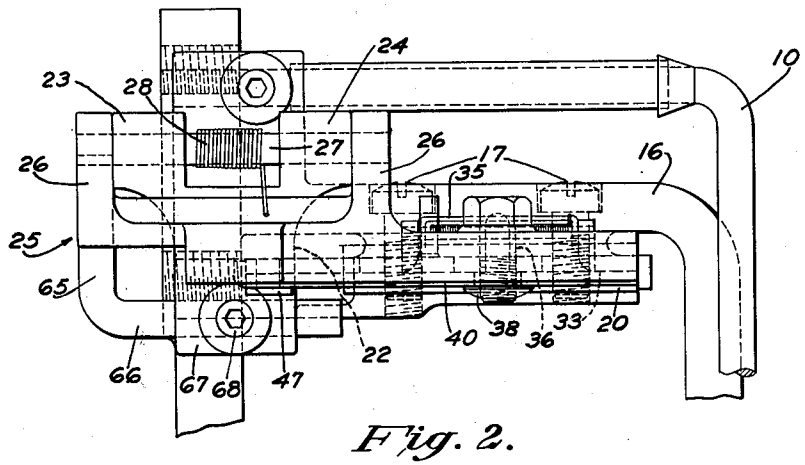


Fig. 2.

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SLUB CATCHER OR YARN CLEANER

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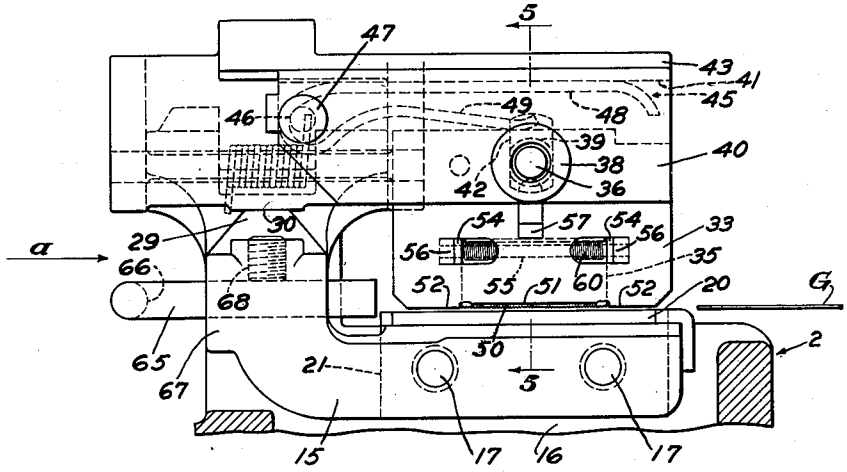


Fig. 3.

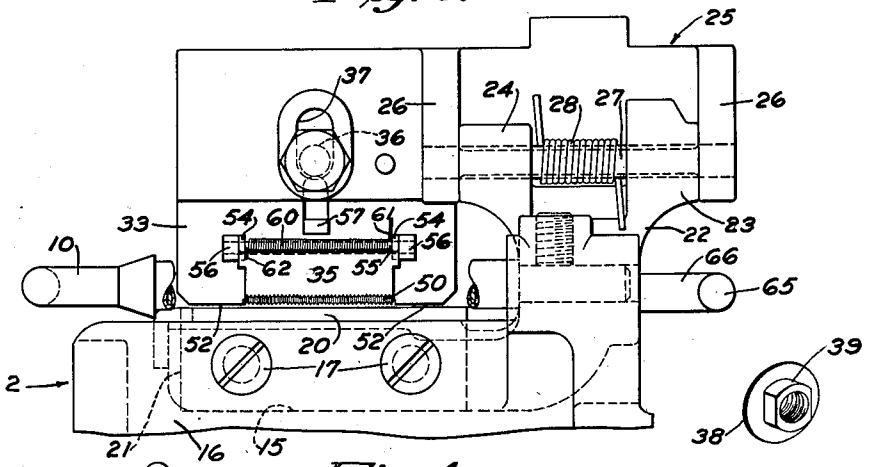


Fig. 4.

Fig. 7.

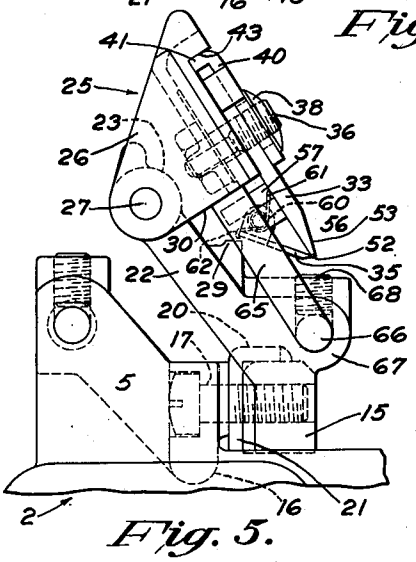


Fig. 5.

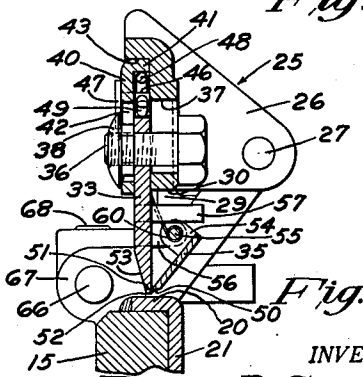


Fig. 6.

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UNITED STATES PATENT OFFICE

2,622,305

SLUB-CATCHER OR YARN CLEANER

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15 Claims. (Cl. 28—64)

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This invention relates to slub-catchers and yarn-cleaners for removing slubs, bunches, lint, motes and other foreign matter from yarn, thread and similar strand materials during winding or other processes of transferring the strand material in the textile art.

One object of the invention is to provide a device of the type indicated having opposed elements forming a slit or opening therebetween through which the yarn feeds with means for adjusting the width of the opening with precision and accuracy in accordance with the different size or thickness of the strand material to be operated upon.

Another object of the invention is to provide a device of the type indicated in which one of the opposed elements has a serrated or toothed edge for engaging slubs or enlargements on the strand material to break them out of the yarn.

Another object is to provide means for adjusting the slit or opening formed by the yarn-engaging elements of the device by means of a gauge inserted therebetween without danger of damaging or dulling the points of the fine teeth on one of the elements.

Another object is to provide manually-operable means for maintaining the yarn-engaging elements in open relationship to facilitate cleaning the device or for other purposes.

Further objects of the improvement are set forth in the following specification which describes a preferred form of construction of the improved slub-catcher or yarn-cleaner as illustrated in the accompanying drawings. In the drawings:

Fig. 1 is a side elevational view showing the present improved slub-catcher mounted on the bracket of a tension-device and arranged to operate on a yarn or thread feeding through the tension-device to deliver to a winding or other machine;

Fig. 2 is an enlarged plan view of the slub-catcher and yarn-cleaner shown without the tension-device, but with the mounting bracket indicated in fragmentary view;

Fig. 3 is an enlarged front elevational view of the slub-catcher and yarn-cleaner;

Fig. 4 is an enlarged rearward elevational view of the same;

Fig. 5 is an enlarged end view of the same looking in the direction indicated by the arrow *a* in Fig. 3 and illustrating the movable yarn-engaging element as rocked away from its opposite cooperating element with the parts held in

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open relationship by manually-adjustable means;

Fig. 6 is a transverse sectional view of a portion of the device taken on line 5—5 of Fig. 3 and showing the parts in operative relationship; and

Fig. 7 is a detailed perspective view of the thimble-like nut employed for securing certain parts of the device in adjusted position.

Numerous types of slub-catchers have been previously used in the textile art for cleaning yarn, thread and similar strand materials during the feeding thereof in transfer processes such as winding the yarn into cops or packages. Most of these prior art devices comprise a fixed element across which the yarn draws with a movable element or blade arranged in spaced relation to the fixed element to form a slit therebetween through which the yarn passes to clear it of slubs, lint, motes and other adhering matter. One or both of the yarn-engaging elements are usually adjustable to vary the width of the slit through which the yarn passes in accordance with the size or thickness of the material. In some instances it has been the practice to provide one of the yarn-engaging elements with needle-like teeth on its edge adapted to engage and remove the slubs or enlargements and in such case it has usually been found difficult to adjust the relative positions of the elements with a gauge inserted therebetween without bending or blunting the fine teeth on one of the elements. It is, therefore, a particular object of the present invention to provide means for mounting the element having the serrated or toothed edge on another element provided with straight edge portions in alinement with the points of the teeth so that a metal gauge, such as a thin strip of sheet-steel, may be inserted between the two members to adjust the width of the slit or opening formed thereby without damage to the teeth on the serrated element. To accomplish this purpose one preferred form of slub-catcher is shown herein, by way of example, it being understood that variations may be made in the shape and arrangement of its parts without departing from the spirit of the invention.

Referring to the drawings, slub-catchers are usually arranged in cooperation with a tension-device for applying a drag on the yarn to control its feed as it delivers to a winding machine or other textile apparatus and Fig. 1 illustrates the present improved slub-catcher as mounted on a bracket 2 carrying a disk-type of tension-device indicated generally at 3. The bracket 2 may

have an inclined portion 4 for attaching it to any part of a textile machine to serve as the mounting for the tension-device and slub-catcher. The tension-device 3 may be of conventional type comprising a pair of concavo-convex disks 6 and 7 mounted rotatively on an axial pin 8 and carrying weights 9 on the upper disk for applying pressure to the yarn drawing between the convex faces of the disks. Figs. 1 and 2 of the drawings show a wire guide 10 for facilitating the threading of the yarn into place between the disks 6 and 7 and directing it therefrom to another wire guide such as shown at 11 in Fig. 1; it being understood that the tension-device and wire-guiding means as above described are of conventional type and form no part of the present invention.

The present improved slub-catcher and yarn-cleaner is shown more in detail in Figs. 3 to 6, being illustrated in vertical position for the sake of clarity rather than in the inclined relationship shown in Fig. 1. Referring to Figs. 3, 4 and 5, the bracket 2 may be constructed with an integral portion 5 projecting upwardly from its rearward end for mounting the parts of the slub-catcher; or, in other cases, the mounting for the slub-catcher may be made separate from the bracket for attachment to another part of a machine. As shown in Figs. 4 and 5, the slub-catcher mounting may comprise a horizontally-extending bar 15 which is attached to the rearward cross strip 16 of the part 5 of the bracket 2 by means of screws 17 inserted from the rear with their heads counter-sunk in the metal, see Fig. 5. This bar-portion 15 of the mounting is adapted to serve as the support for the anvil across which the yarn feeds as it is operated upon by the opposed scraper-element and, preferably, its upper portion is covered with a hardened metal facing 20. The facing 20 may be constructed from a strip 21 of sheet-metal disposed vertically between the support or bar 15 and the cross-strip 16 of the bracket 2 with its upper portion folded over at right-angles to overlie the upper face of the bar. The facing 20 constitutes the anvil proper, being held in place by the screws 17, previously described, which are inserted through the cross-strip 16 of the bracket 2 and threaded into holes in the crossbar 15. Through this arrangement the anvil-facing 20 may be removed for replacement should it become worn or grooved by the yarn. Rising from the crossbar 15 is an angular arm 22, see Fig. 5, made integral therewith and terminating at the top in a bifurcated portion forming spaced bearing hubs 23 and 24. Pivotally mounted on the upper end of the arm 22 is a swinging member 25 having ears 26 straddling the bearing hubs 23 and 24 with a pin 27 extending through the ears and the bearings. A helical spring 28 coiled around the pin 27 between the bearing hubs 23 and 24 has one end hooked around the main portion of the arm 22 and its opposite end projecting into engagement with the rearward face of the member 25. The spring 28 tends to rock the member 25 in clockwise direction as viewed in Fig. 5, or downwardly toward the anvil 20, its movement in this direction being limited by a lug 29 on the arm 22 which engages a finished face 30 on the bottom of the member 25.

The member 25 forms the support for the adjustable scraper-element of the slub-catcher and yarn-cleaner which is of novel construction and arrangement as next described. The scraper-element comprises a plate 33 carrying a serrated-edged yarn-engaging blade 35 pivoted thereon with the plate providing the adjusting means therefor. As shown most clearly in Fig. 6, the plate 33 abuts a finished face on the front of the member 25 and is secured in adjustable position thereon by means of a stud or screw 36. The screw 36 projects through a slot 37 in the member 25, see Fig. 4, and extends through a hole in the plate 33 with its threaded end screwed into a thimble-like nut 38. The head of the nut 38 bears against a cover-plate 40 which abuts the front of the plate 33 and is formed at the top with a rearwardly-projecting flange 41 overlying the upper edge of the plate. The nut 38, shown in perspective view in Fig. 7, is formed with a square-sided shank 39 which fits within the sides of a slot 42 in the cover-plate 40. Through this arrangement the plate 33 may be adjusted up and down without disturbing the relationship of the cover-plate 40, the upper flange of which underlies a shouldered ledge 43 on the mounting member 25, see Fig. 6. By tightening the screw 36 in the nut 38 the plate 33 may be securely fastened in adjusted position with its lower edge spaced above the anvil-facing 20 as shown in Fig. 6.

Means may be provided for resiliently sliding the plate 33 downwardly when the screw 36 is released to engage its lower edge with a gauge placed on the anvil-facing 20; the gauge being usually in the form of a thin strip of steel such as indicated at G in Fig. 3 to establish the proper size of the slit or opening between the yarn-engaging elements of the slub-catcher. For sliding the plate 33 a hair-pin-shaped spring 45, shown in dotted lines in Fig. 3, is mounted with its looped end encircling a pin 46 which projects rearwardly from the cover plate 40 at one end thereof, Fig. 3 showing the pin 46 in dotted lines with its head 47 represented in full lines. The pin 46 is preferably inserted through a hole in the cover-plate 40 and its head 47 may be welded or brazed to the forward face of said plate. One arm 48 of the spring 45 underlies the flange 41 on the cover-plate 40 in engagement therewith while its opposite arm 49 is bowed upwardly and extended outwardly toward the center of the plate 33 to bear against the upper edge thereof. Through this form of construction the spring 45 normally tends to slide the plate 33 downwardly and when the stud 36 is released the spring will seat the lower edge of the plate against the gauge inserted thereunder to automatically set the device for a predetermined size of opening through which the yarn is caused to feed.

In accordance with one novel feature of the present invention the plate 33 is provided solely for setting or adjusting the width of the slit or opening between the yarn-engaging elements without any function as regards the scraping or cleaning action of the device. That is to say, the scraping or cleaning action is performed by the pivoted blade 35 which is mounted at the rearward side of the plate 33 in inclined relation thereto with the teeth 50 on its serrated edge projecting into an elongate opening extending along the lower edge of the plate. Stated another way, the adjusting plate 33 has its lower edge cut away to form a narrow recess at 51 extending throughout the greater portion of its length. At opposite ends of the recess the plate 33 is formed with

straight-edged portions 52—52 for engaging with the gauge placed on the anvil-facing 20, thus to predetermine the width of the opening between the points of the teeth 59 and the anvil-facing but without causing contact of the gauge with the teeth liable to damage or dull their points. Preferably, the bottom portion of the plate 33 is beveled at 53 to reduce the width of its edges 52, see Fig. 6. The scraper-blade 35 is formed with a pair of ears 54—54, see Figs. 4 and 6, which are apertured to receive a pin 55 held in rearwardly-projecting bearings 56 on the plate 33. The bearings 56 may be formed by punching narrow strips from the metal of the plate 33 and bending them rearwardly to stand at right-angles thereto as indicated more particularly in Figs. 3 and 6. A lug 57 punched or sheared from the plate 33 is bent rearwardly to form a stop or detent for engagement with the upper edge of the blade 35 to limit its pivotal motion about the pin 55. A helical spring 60 coiled around the pivot-pin 55 has one end 61 extending upwardly and bearing against the back of the plate 33 while its opposite end 62 is hooked over the upper edge of the blade 35 to swing the latter downwardly at an angle to the plate with its lower serrated edge engaging with the edge of the recess 51 in the plate. In this way the scraper-blade 35 is normally resiliently retained in position with its needle-pointed teeth 59 projected through the opening or recess 51 in the plate 33; that is, directed toward the feeding strand of yarn at an angle thereto to adapt the teeth to engage thick slubs, bunches or other foreign matter on the yarn to clear it therefrom. The object of employing a serrated edge or needle-pointed teeth on the scraper-blade for engagement with slubs and the like is to insure that such enlargements cannot pass through the slub-catcher and cleaner without breaking the yarn. That is, where heretofore plain or straight-edged blades have been used with their edges opposed to an anvil or the like to form a slit, it has been found that they will simply flatten or iron out the enlargements or slubs and allow them to pass through the slit without breaking the yarn. With the present form of construction the needle-points on the blade 35 will impinge upon and penetrate into the slub or bunch to prevent its passage through the device, thereby resulting in breaking the yarn as desired so that its defective length may be removed and the ends connected by tying them together at a point beyond the slub-catcher. At the same time, the serrated edge of the blade 35 will scrape the yarn to clear it of lint, motes and other foreign particles adhering thereto. The present device thus operates with maximum efficiency for cleaning the yarn, thread and other strand materials while breaking out slub, bunches or other defects therein.

It has been stated that the member 25 which carries the plate 33 and the hinged scraper-blade 35 is pivotally mounted on the arm 22 which forms the main support of the movable parts of the device and normally this member is urged downwardly by the relatively heavy spring 28 with its lower portion engaging the lug 29 to maintain the plate 33 and the hinged blade 35 in operative position relative to the anvil-facing 20. When it is required to clean the device, however, or to raise the plate 33 and blade 35 for any other purpose means are provided for holding the member 25 rocked upwardly to the position shown in Fig. 5. Such means may comprise a rockable arm 65 formed by the right-angled bent end of

a rod 66 which may be pivoted in a hub or bearing 67 at the bottom of the arm 22, see Figs. 2 and 5. The arm 65 may normally be held in its lowered position shown in Fig. 6 by means of a set-screw 68 threaded through the hub 67, see Fig. 3, and by releasing the screw the arm may be turned upwardly at an angle to the horizontal to engage its end under the bottom of the member 25 to hold the latter raised with the bottom of the plate 33 and the serrated edge of the blade 35 elevated above the anvil-face 20 for a considerable distance as shown in Fig. 5.

It will be observed from the foregoing specification that the present invention provides an especially efficient slub-catcher and yarn-cleaner having the cleaning blade serrated or formed with needle-points on its yarn-engaging edge, with provision for adjusting the size of the opening through which the yarn feeds by means of a hardened gauge without danger of bending or blunting the needle-pointed teeth on the blade.

The invention also provides for rapid and convenient adjustment of the parts of the device with great precision and accuracy in accordance with different sizes or thicknesses of the strand material to be operated upon and without chance of maladjustment due to the human element. While the improved device is herein shown as embodied in a preferred form of construction, it is to be understood that various modifications may be made in the shape and arrangement of its parts without departing from the spirit of the invention or the scope of the appended claims. Therefore, without limiting myself in this respect, I claim:

1. A slub-catcher and yarn-cleaner comprising a support, a member fixedly mounted on said support to adapt a strand of yarn to feed thereacross, a movable member adjustable on the support toward and away from the fixed member to regulate the size of the opening therebetween, means to secure said movable member in fixed relation to said fixed member, said movable member having a recess in its edge overlying the fixed member, and a scraper-blade mounted on the movable member in inclined relation thereto and formed with teeth projecting into the recess in the movable member.

2. A slub-detector and yarn-cleaner comprising an anvil across which a strand of yarn is adapted to feed, a member mounted to move relatively to the anvil to adjust its edge in opposed relation thereto to form an opening therebetween, said movable member formed with a recess in its edge with a portion projecting from the end of the recess toward the anvil to provide a gauging face, and a scraper-blade mounted on the movable member and provided on its edge with needle-pointed teeth projecting into the recess of the movable member with their points in alinement with the gauging face thereof.

3. A slub-detector and yarn-cleaner comprising a support, an anvil fixed on said support to adapt a strand of yarn to draw thereacross, a member movably mounted on the support for adjustment toward and away from said anvil, said movable member having a recess in its lower edge with projecting portions at either end thereof provided with straight edges for engagement with a gauge placed on the anvil, and a scraper-blade mounted on said movable member and provided with needle-like teeth on its edge projecting into the recess in said movable member with their ends in alinement with the straight edges thereof.

4. A slub-detector and yarn-cleaner comprising

a support, a fixed element on said support across which a strand of yarn is adapted to feed, a plate mounted on the support to move toward and away from the fixed element to vary the width of the opening therebetween, means for fastening said plate in adjusted position on the support, said plate having a longitudinally-extending recess in its lower edge with projections at its ends formed with straight faces in parallel relation to the fixed element, and a scraper-blade mounted on the rear of the plate and formed with teeth in its lower edge projecting into the recess in the lower edge of the plate with the ends of the teeth in alinement with the straight faces at the ends of he recess.

5. A slub-detector and yarn-cleaner comprising a relatively fixed anvil for supporting a feeding yarn strand, a plate mounted above the anvil and adjustable to form an opening of variable width therebetween, said plate formed with a relatively narrow recess in its lower edge and projecting end portions having straight faces parallel to the plane of the anvil, a scraper-blade pivoted on the rearward side of the plate and formed with teeth on its lower edge, and resilient means for maintaining said scraper-blade with its teeth projecting into the recess in the lower edge of the plate with their ends in alinement with the straight faces thereof.

6. A slub-detector and yarn-cleaner comprising a support, an anvil fixedly mounted on said support to adapt a strand of yarn to draw thereacross, a member pivoted on the support above the anvil to adapt it to rock toward and away therefrom, a plate slidably mounted on said rockable member to adapt it for adjustment with its lower edge in spaced relation to the anvil, means for securing said plate in adjusted position in relation to the anvil, a scraper-blade pivoted on the rear of the plate and formed with teeth on its lower edge, and a spring for rocking said blade on the plate to project the points of its teeth into the opening between the plate and the anvil.

7. A slub-detector and yarn-cleaner comprising a mounting, an anvil fixed to the mounting and adapted to support a strand of yarn drawing thereacross, a rockable member pivoted on the support above the anvil, a spring for rocking said member toward the anvil, means for limiting the rocking motion of said member, a plate adjustable on said rockable member for supporting it with its edge in spaced relation to the anvil, a scraper-blade pivoted to the plate and formed with a serrated edge, and a spring operating on said scraper-blade to maintain it in position with its serrated edge projected into the space between the edge of the plate and the top of the anvil.

8. A slub-detector and yarn-cleaner comprising a fixed anvil for supporting a strand of yarn to feed thereacross, a rockable member pivoted above said anvil, a spring for rocking said member toward the anvil, a stop for limiting the movement of said member toward the anvil, a plate adjustable vertically on said rockable member, a spring for moving said plate to adjust it towards the anvil, means for securing said plate in adjusted position on the rockable member, a blade pivoted at the rear of the plate and formed with a serrated lower edge, and a spring for rocking said blade into inclined relation to the plate to project its teeth into the space between the plate and the anvil.

9. A slub-detector and yarn-cleaner comprising a mounting, a hardened facing supported on the mounting to form an anvil across which a yarn is adapted to feed, a plate adjustably mounted above the anvil, means for securing said plate in adjusted position relatively to the anvil, said plate having a longitudinally-extending recess in its lower edge bordered by plane faces adapted to aline in parallel relation to the anvil, and a scraper-blade mounted on the plate in inclined relation thereto and formed on its edge with teeth projecting into the recess in the plate with their points in alinement with the straight faces thereof whereby to provide for the insertion of a gauge between the straight faces of the plate and the anvil to regulate the width of the opening therebetween.

10. In combination, a fixed anvil for supporting a strand of yarn to feed thereacross, a member rockably mounted above the anvil to swing toward the latter, a spring for rocking said member, means to limit the rocking motion of said member, a movable member supported on said rockable member, means to adjust said movable member to position its lower edge in spaced relation to the anvil, a scraper-blade mounted on the movable member, a spring for rocking said scraper-blade to project its lower edge into the space between the edge of the plate and the anvil, and manually-operable means for supporting the rockable member in elevated position to withdraw its lower edge and the edge of the scraper-blade into open relation to the anvil.

11. In a device of the type indicated, a support, a stationary member fixed on said support in position to adapt a strand of yarn to feed thereacross, a rockable member pivoted on said support above the stationary member, a spring for rocking said member to move it toward the stationary member, means to limit the movement of the rockable member to maintain it in fixed relation to the stationary member, a member adjustable on the rockable member to position it in opposed relation to the stationary member, a scraper-blade carried by said member for engagement with a yarn feeding across the stationary member, and an arm rockably mounted on the support to adapt it to be turned into position engaging the rockable member to hold the latter raised with the adjustable member and scraper-blade elevated above the stationary member.

12. In a device of the type specified, a mounting, an anvil fixedly supported on said mounting to adapt a strand of yarn to feed thereacross, a member rockably mounted above the anvil, a scraper-blade adjustable on said member to position its edge in opposed relation to the anvil and provide a slit therebetween, means for rocking said blade-supporting member to normally maintain the scraper-blade in cooperative relation to the anvil, and an arm pivoted on the support and adapted to be manually rotated to engage its end with the rockable member to hold the latter elevated and the scraper-blade spaced above the anvil in open relation thereto.

13. In a device of the type indicated, a fixed rest for supporting a strand of yarn to feed thereacross, a rockable member pivoted above said rest to swing toward the latter, a stop for limiting the movement of said rockable member toward the rest, a member adjustable on said rockable member in spaced relation to the rest, means for securing said last-named member in adjusted position on the rockable member, and a scraper-

blade pivoted on the adjustable member and formed with a serrated lower edge with teeth projecting into the space between the adjustable member and the rest.

14. In combination, fixed means for supporting a strand of yarn to feed thereacross, a member rockably mounted above said fixed means to swing toward the latter, means to limit the rocking motion of said member, a movable member supported on said rockable member, means to adjust said movable member to position its lower edge in spaced relation to the yarn-supporting means, and a scraper-blade pivotally mounted on the movable member and formed with teeth on its edge projecting into the space between the edge of the movable member and the fixed means which supports the strand of yarn.

15. In a device of the type specified, an anvil fixedly supported to adapt a strand of yarn to feed thereacross, a member rockably mounted above the anvil, a plate adjustably mounted on

the rockable member to position its lower edge in opposted relation to the anvil and provide a slit therebetween, and a scraper-blade pivoted on one side of the plate and formed with teeth on its edge adapted to project into the space between the lower edge of the plate and the anvil.

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