To all whom it may concern:

Be it known that I, LOUIS B. HASBROUCK, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Devices for Operating on Traveling Yarns, fully described and represented in the following specification, and the accompanying drawings, forming a part of the same.

This invention relates to a device for operating on a traveling yarn and aims to provide a device which will automatically adjust itself for operation upon yarns of different sizes.

A further object of the invention is to provide such a device with means for adjusting it to operate upon yarns of different characters, or to change the nature of its operation.

A still further object of the invention is to provide a device for eliminating from a traveling yarn all slubs or bunches, including bunches which are so soft that they would be drawn through an ordinary slab catcher.

A device constructed in accordance with the invention has two separable controlling members which are gently urged together and have opposed surfaces between which the yarn passes. Elements for operating upon the yarn are connected to these controlling members in such manner that the distance between the operative elements is determined by the extent to which the opposed surfaces of the controlling members are separated by the yarn between them. In consequence, the operative elements are automatically placed in proper position to operate upon a yarn of any size as soon as this yarn is drawn through the device so that it extends between the opposed surfaces of the controlling members. A feature of the invention consists in utilizing the tension of the traveling yarn to urge the opposed surfaces of the controlling members toward each other. This serves to prevent accidental or momentary separation of these members during the operation of the device.

In order to adapt the device to catching soft bunches or slubs which would pass between the blades of an ordinary slab catcher, one of the operative elements is made in the form of a comb with sharp teeth along its operative edge. The comb is supported just out of contact with the yarn so as not to catch or tear the fibers of the yarn. When a bunch, no matter how soft, is drawn into the device, the fibers of the bunch become caught in the comb, so that the yarn is held and broken, permitting the removal of the bunch. A further feature consists in so arranging the device that the increased tension on the yarn caused by the catching of a bunch on the comb serves to move the comb toward the yarn and thus to cause it to hold the bunch still more securely.

Other features and advantages of the invention are hereinafter set forth.

Although the broad features of the invention may be embodied in a device of any sort for operating upon a traveling yarn, the nature of the invention may be understood from a description of an illustrative embodiment adapted to eliminate bunches and slubs from cotton or worsted yarns. Such a slab catcher is shown in the accompanying drawings, in which:

Fig. 1 is a side elevation of the slab catcher;
Fig. 2 is a top view;
Fig. 3 is an side view sectioned on the line 3—3 of Fig. 2;
Fig. 4 is an enlarged transverse section on the line 4—4 of Fig. 2; and
Fig. 5 is a partial view sectioned on the line 5—5 of Fig. 3.

The slab catcher shown in the drawings has a vertical supporting plate 10 which may conveniently be mounted by securing it to a horizontal bar 11 by means of a set screw 12. A flange extending from the upper edge of the plate 10 near its front end is bent over to provide a horizontal front guide 14 having ears 15 between which the yarn is dropped in threading the device. On the front guide 14 is a tension device 16 which may take the form of a disc 17 loosely mounted on a stud 18 projecting upwardly from the front guide.

A flange extending from the upper edge of the plate 10 near its middle is bent over to provide a horizontal bed 19 whose upper surface is at the same level as that of the front guide 14, and an upwardly curved ear 21 to guide the yarn onto the bed in the threading of the device. The bed 20 con-
tains a central opening 22 whose rear edge 23 is acute. The front portion 24 of the bed serves as one of the two operative or slab-catching elements of the device, while the rear portion 25 of the bed serves as a controlling member cooperating with a movable controlling member or rest 30 in determining the relative position of the two operative elements. The movable controlling member 30 is, in the form shown, carried by a lever 31.

The lever 31 is pivoted at one end on a horizontal stud 32 projecting from the side of the plate 10 opposite to that from which the bed 20 projects. The stud 32 is located nearer the front end of the plate 10 than the bed and below the level of the bed. A sleeve 33 secured to the lever and surrounding the stud prevents lateral movement of the lever. The controlling member or rest 30 is formed by a flange which extends from the upper edge of the lever 31 near its free end and is bent over to extend across the upper edge of the plate 10 with its lower surface 34 opposed to the upper surface 26 of the rear portion 25 of the bed. The lower front edge of the rest 30 lies directly over the acute front edge 23 of the rear portion 25 of the bed. The lower outer edge of the rest 30 is bevelled at 35 (Fig. 4) to facilitate drawing a yarn between the surfaces 26 and 34 when the device is threaded. To the rest 30 is secured a comb 40 which serves as the principal operative element of the device. The operative edge 41 of this comb is provided with sharp teeth 42, and lies over the portion 24 of the bed 20 to cooperate with this portion of the bed in catching slubs. In order that the position of the operative edge 41 may be adjusted with respect to the plane of the lower surface 34 of the rest 30, the upper surface 43 of the rest 30 is inclined to its lower surface and the rear portion of the comb is held against this upper surface by a screw 44 passing through a longitudinal slot 45 in the comb. The comb 30 is narrower than the rest 30 so that its operative edge 41 does not extend as far out from the plate 10 as does the rest 30.

A flange extending from the upper edge of the lever 31 at its free end is bent over to provide a horizontal foot 50 extending across the upper edge of the plate 10 behind the bed 20, and a downwardly curved ear 51 at the outer end of the foot serving to guide the yarn onto the upper surface 52 of the foot when the device is threaded.

A rear thread guide 55 is mounted on an arm 56 projecting rearwardly from an upper part of the plate 10. The guide is secured to this arm by a bolt passed through a vertical slot 57 in the arm so that the guide may be adjusted up or down. It is normally positioned with the uppermost part of its groove 58 located below a straight line extending from the rear edge of the bed 20 over the foot 50, so that the yarn turns downward after passing over the foot.

To facilitate threading the device a guard 60 is secured to the plate 10. This guard has a curved portion 61 which extends over the comb 40 and has its end 62 located just above the inner end of the curved ear 21. The use and operation of the device described is as follows:—The device is thread-ed by dropping a yarn into the opening between the ears 15 of the front guide 14, into the opening between the guard 60 and the ear 21, and passing the yarn over the rear guide 55. As soon as a forward pull is applied to the yarn, it slips sideways under the tension disc 17, under the rest 30, and over the foot 50. In slipping under the rest 30, the yarn strikes the bevelled surface 35 of the rest and raises the rest and with it the comb 40. As the comb does not project as far out as the rest, the yarn has raised the rest and the comb before it comes under the operative edge 41 of the comb and in consequence does not catch in the teeth 42.

As the yarn travels through the device, the rest 30 rides on its upper surface, and positions the operative edge 41 of the comb 40 either adjacent to or at a desired distance above the upper surface of the yarn. Any specks or loose dirt adhering to the yarn are scraped from the yarn by the acute edge 23, and such dirt is thus prevented from entering under the rest 30 and raising it above the level of the upper surface of the yarn. The slight raising of the rest and the consequent vibration of the lever 31 which might be caused by irregularities in the yarn itself are prevented by the pressure of the yarn on the upper surface of the foot 50.

When a slab is drawn into the device, some of its fibers become entwined in the teeth 42 of the comb 40 and the tension on the part of the yarn beyond the comb is thereby increased. The operative edge 41 of the comb is then drawn down against the portion 24 of the bed, clamping the slab between the comb and the bed, so that the yarn is broken. Two forces contribute to this downward movement of the comb. The first is the pull of the strands which are caught on the teeth of the comb, which tends to draw the comb downwardly because of the fact that the pivot 32 is located below and in front of the operative edge 41 of the comb. The second downward force is the increased pressure of the yarn on the foot 50 which is caused by the increased tension.

The position of the operative edge 41 of the comb with reference to the plane of the lower surface 34 of the rest 30 is adjusted in accordance with the kind of yarn operated upon. This adjustment is made by loosening the screw 44 and sliding the comb for-
wardly or rearwardly on the inclined surface 43 until its operative edge 41 is in the desired position. The adjustment is ordinarily such that the operative edge 41 of the comb lies slightly above the plane of the lower surface 34 of the rest 30 so that, when the rest is resting on the yarn, the operative edge 41 of the comb is just out of contact with the upper surface of the yarn. The exact adjustment necessary to obtain this result depends upon the character of the yarn, and particularly upon its softness. When the proper adjustment has once been obtained for a yarn of any given character, the device automatically adjusts itself for operation on all other yarns of the same character, regardless of their size. Furthermore, in case it is desired to break the yarn only when slubs projecting beyond the predetermined distance from the yarn enter the device, the comb may be adjusted so that it lies at this distance from the upper surface of the yarn. In this case also the adjustment of the comb on the rest will remain the same for all sizes of yarn.

The pressure of the yarn on the foot 50 should be very slight, so that the yarn will not be pinched between the surfaces 34 and 26, but on the other hand this pressure should be sufficient to prevent the lever 31 from vibrating. The proper pressure may be obtained by adjusting the rear guide 55 in its slot 58, it being apparent that the further down the guide is moved in its slot the greater the pressure of the yarn upon the foot 50.

The device has proved to be highly efficient when used either with cotton or with worsted yarn and is I believe the first device of this character in which the relative position of the operative elements is automatically adjusted in accordance with the size of the yarn, and the first device capable of catching the soft bunches found on worsted yarns. As novel principles have been utilized to accomplish these results, I wish it clearly understood that the invention is by no means limited to the form and arrangement of the parts of the illustrative device described. In fact, many features of the invention are applicable to devices operating upon traveling yarns for purposes other than the catching of slubs, for example, to devices for cleaning, dyeing, or otherwise treating yarns.

What is claimed is:

1. A self-adjusting device for operating on a traveling yarn, comprising two separable controlling members which are gently urged together and have opposed surfaces between which the yarn passes, and opposed operative elements positioned to act on the yarn at a distance from said controlling members and so connected to said members respectively that when the distance between the controlling members is increased by the use of a larger yarn or decreased by the use of a smaller yarn the distance between the operative elements is correspondingly increased or decreased so that they are spaced from each other by a distance which is determined by the extent to which the surfaces of the controlling members are separated by the yarn.

2. A device for operating on a traveling yarn, comprising two separable controlling members which are gently urged together and have opposed surfaces between which the yarn passes, means for scraping impurities from the yarn before it enters between said opposed surfaces, and opposed operative elements positioned to act on the yarn at a distance from said controlling members and connected to said members respectively so that they are spaced from each other by a distance which is determined by the extent to which the surfaces of the controlling members are separated by the yarn.

3. A device for operating on a traveling yarn, comprising two separable controlling members which are gently urged together and have opposed surfaces between which the yarn passes, one of said members having an acute front edge adapted to scrape impurities from the yarn before the yarn enters between said opposed surfaces, and opposed operative elements positioned to act on the yarn at a distance from said controlling members and connected to said members respectively so that they are spaced from each other by a distance which is determined by the extent to which the surfaces of the controlling members are separated by the yarn.

4. A device for operating on a traveling yarn, comprising two separable controlling members which have opposed surfaces between which the yarn passes, means for utilizing the tension of the traveling yarn to urge said controlling members toward each other, and opposed operative elements positioned to act on the yarn at a distance from said controlling members and connected to said members respectively so that they are spaced from each other by a distance determined by the extent to which the surfaces of the controlling members are separated by the yarn.

5. A self-adjusting device for operating on a traveling yarn, comprising two separable controlling members which are gently urged together and have opposed surfaces between which the yarn passes, and opposed operative elements positioned to act on the yarn at a distance from said controlling members and so connected to said members respectively that when the distance between the controlling members is increased by the use of a larger yarn or decreased by the use of a smaller yarn.
the distance between the operative elements is correspondingly increased or decreased so that they are spaced from each other by a distance which is determined by the extent to which the surfaces of the controlling members are separated by the yarn, the connection between one of the operative elements and one of the controlling members being adjustable to permit variation of the difference between the distance separating the operative elements and the distance separating the controlling members.

6. A device for operating on a traveling yarn, comprising means for guiding the traveling yarn in a straight line, a controlling member movable transversely to the yarn and having a surface which is urged against the surface of the yarn, and an operative element carried by said member and positioned to act on the yarn at a distance from said member.

7. A device for operating on a traveling yarn, comprising a vertically movable member having a surface riding on the upper surface of the yarn, and an operative element carried by said member and positioned to act on the yarn at a distance from said member.

8. A device for operating on a traveling yarn, comprising a fixed controlling member having a surface across which the yarn passes, a second controlling member movable transversely to the yarn and having a surface opposed to the surface of the fixed controlling member and urged against the surface of the yarn, and an operative element carried by said movable controlling member and positioned to operate on the yarn at a distance from said controlling member.

9. A device for operating on a traveling yarn, comprising a fixed controlling member having a surface over which the yarn passes, a vertically movable controlling member having a surface opposed to the surface of said fixed controlling member and resting on the upper surface of the yarn, and an operative element carried by said movable controlling member and positioned to operate on the yarn at a distance from said controlling member.

10. A device for operating on a traveling yarn, comprising a bed over which the yarn passes, a vertically movable controlling member having a surface resting on the upper surface of the yarn over said bed, and an operative element carried by said controlling member and having an operative edge located over the portion of the bed in front of said bed.

11. A device for operating on a traveling yarn, comprising a bed having a surface over which the yarn passes and containing a central hole having an acute rear edge, a vertically movable controlling member having a surface resting on the upper surface of the yarn over the portion of said bed behind said hole, and an operative element carried by said controlling member and having an operative edge located over the portion of the bed in front of said hole.

12. A device for operating on a traveling yarn, comprising a movable member having a surface riding on the surface of the yarn, an operative element carried by said member and having an operative edge located to operate on the yarn at a distance from said member, and means for adjusting the position of said edge of the operative element with respect to the plane of said surface of the movable member.

13. A device for operating on a traveling yarn, comprising a vertically movable member having a surface riding on the upper surface of the yarn and a spaced surface over which the yarn is drawn, and an operative element carried by said member and having an operative edge located to act on the yarn at a distance from said member.

14. A device for operating on a traveling yarn, comprising a bed over which the yarn passes, a vertically movable controlling member having a surface resting on the upper surface of the yarn over said bed, an operative element carried by said controlling member and having an operative edge located in front of said controlling member and above said bed, a foot carried by said controlling member located behind said bed and having a surface over which the yarn passes, and a thread guide located behind said foot and below the level of the upper surface thereof.

15. A device for operating on a traveling yarn, comprising a support, a bed fixed on said support, a vertically movable controlling member having a surface resting on the upper surface of the yarn over said bed, a foot carried by said controlling member located behind said bed and having an upper surface over which the yarn passes, a vertically adjustable thread guide mounted on said support behind said foot, and cooperating operative members adapted to act on the yarn in front of said bed and carried by said support and said controlling member respectively.

16. A device for operating on a traveling yarn, comprising a fixed bed, a vertically movable member having its lower surface opposed to the upper surface of said bed and having a bevelled outer edge lying within the outer edge of said bed, and an operative element carried by said movable member and having an operative edge spaced from said movable member and lying in approximately the same plane as the lower surface of said movable member and terminating within the bevelled edge of said movable
member so that when a yarn is drawn sideways across said bed from its outer edge it engages the bevelled edge of the movable member, raises the movable member and its operative element, and passes under the operative edge of the operative element.

17. A device for operating on a traveling yarn, comprising a support, a bed fixed on said support, a member mounted on said support for vertical movement having a lower surface opposed to said bed and a bevelled outer edge, an operative element mounted on said movable member and having an operative edge opposed to said bed, a curved car extending upwardly from the outer edge of the bed, and a curved guard extending over the operative element and terminating a short distance above the inner portion of said car.

18. A device for operating on a traveling yarn, comprising a bed, a vertically movable member having a surface opposed to said bed and a bevelled outer edge, a foot carried by said movable member and spaced from said bed, and an ear projecting from the outer end of said foot and curved downwardly below the level of said bed so that when a yarn is drawn inwardly across said bed it is passed under said movable member and over said foot.

19. A slab-catchinge device for operating on a traveling yarn, comprising a support, a bed fixed on said support, a lever pivoted on said support at a point below and in front of said bed, an operative element carried by said lever, inclined at an acute angle to said bed, and having an edge lying above said bed, and means for normally positioning the edge of said element just out of contact with a yarn passing over said bed.

20. A slab-catchinge device for operating on a traveling yarn, comprising two separable controlling members which are gently urged together and have opposed surfaces between which the yarn passes, an operative element held in fixed relation to one of said members and lying adjacent to the yarn in front of said members, and a second operative element carried by the other of said members, inclined at an acute angle to the yarn, and having an edge opposite said first mentioned operative element.

21. A slab-catchinge device for operating on a traveling yarn, comprising a vertically movable member having a surface riding on the upper surface of the yarn, and a comb carried by said member, inclined at an acute angle to the yarn, and having a toothed edge located in front of said member and a slight distance above the plane of said surface of said member.

22. A slab-catchinge device for operating on a traveling yarn, comprising a vertically movable member having a lower surface riding on the upper surface of the yarn and an upper surface inclined to its lower surface, and an operative element having an edge located in front of said surface, said element being adjustably secured to the upper surface of said member so that it may be moved longitudinally thereon to vary the position of its edge with respect to the plane of the lower surface of said member.

23. A slab-catchinge device for operating on a traveling yarn, comprising a support, a bed fixed on said support, a lever pivoted to said support at a point in front of and below said bed, a controlling member carried by said lever and having a surface opposed to the surface of said bed, an operative element mounted on said controlling member having an edge located in front of the controlling member, a foot carried by said lever located behind said bed and having a surface over which the yarn passes, and a thread guide secured to said support located behind said foot and below the level of the upper surface thereof.

24. A slab-catchinge device, comprising a vertical supporting plate, a flange extending horizontally from the upper edge of said plate at one side thereof and a lever adjacent to the other side of said plate and having one of its ends pivoted thereto, a flange extending horizontally from the upper edge of said lever and lying over the flange of said plate, and a second flange extending horizontally from the upper edge of said lever and lying behind and substantially at the level of the flange of said plate.

25. A slab-catchinge device, comprising a vertical supporting plate, a flange extending horizontally from the upper edge of said plate at one side thereof and formed to provide a thread guide, a second flange extending from the upper edge of said plate at the same side thereof and formed to provide a horizontal bed and an ear curved upwardly from the outer edge of said bed, a lever lying adjacent to the side of said bed opposite to that from which said flanges project, a flange extending horizontally from the upper edge of said lever and lying over said bed, a second flange extending horizontally from the upper edge of said lever lying behind said bed, and a guard secured to said plate extending over said lever and terminating just above the outer edge of said bed.

26. A device for operating on a traveling yarn, comprising means for guiding the yarn, a controlling member movable transversely to the yarn and having a surface which is urged against the surface of the yarn, and a movable operative element positioned to act on the yarn at a distance from said member and so connected with said member that its distance from the
center of the yarn is directly proportional to that of said member.

27. A device for operating on a traveling yarn, comprising a fixed controlling member having a surface across which the yarn passes, a second controlling member movable transversely to the yarn and having a surface opposed to the surface of the fixed controlling member and urged against the surface of the yarn, and an operative element positioned to act on the yarn at a distance from the movable controlling member and so connected with that member that its distance from the axis of the yarn is proportional to the distance between the controlling members.

28. A device for operating on a traveling yarn, comprising a fixed controlling member having a surface over which the yarn passes, a vertically movable controlling member having a surface opposed to the surface of the fixed controlling member and resting on the upper surface of the yarn, fixed and movable operative elements positioned to operate on the yarn at a distance from the controlling members, and a connection between the movable controlling member and the movable operative element arranged so that movements of the movable controlling member toward and away from the fixed controlling member cause corresponding movements of the movable operative element towards and away from the fixed operative element.

In testimony whereof I have hereunto set my name.

LOUIS B. HASBROUCK.