Dec. 1, 1970 S. L. ABBOTT 3,543,357

SLUB CATCHER

Filed Dec. 4, 1968 2 Sheets-Sheet 1

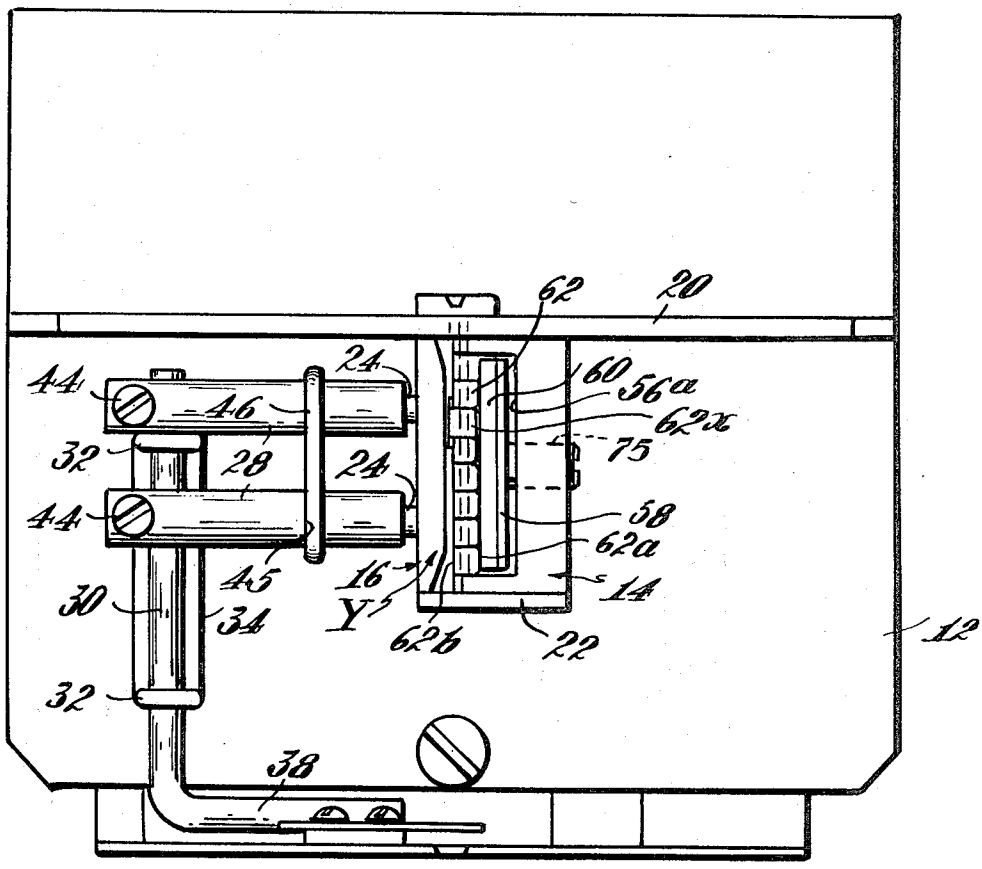


Fig. 1

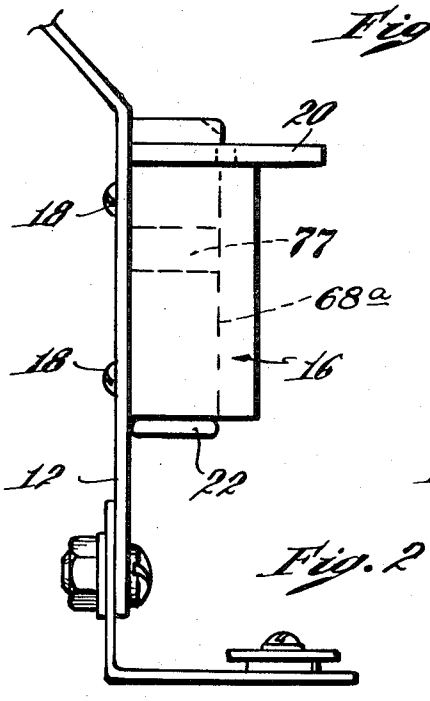


Fig. 2

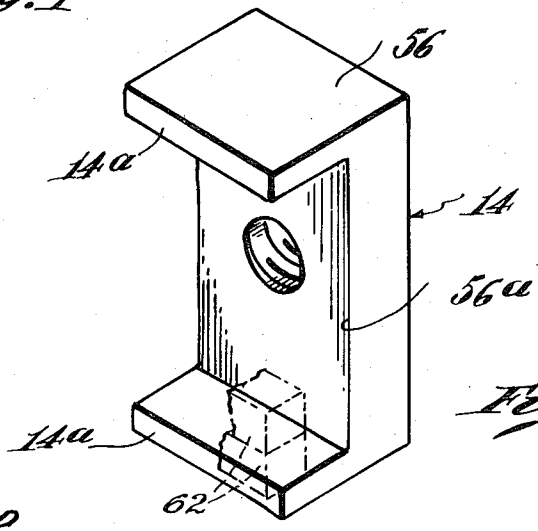


Fig. 4

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SLUB CATCHER

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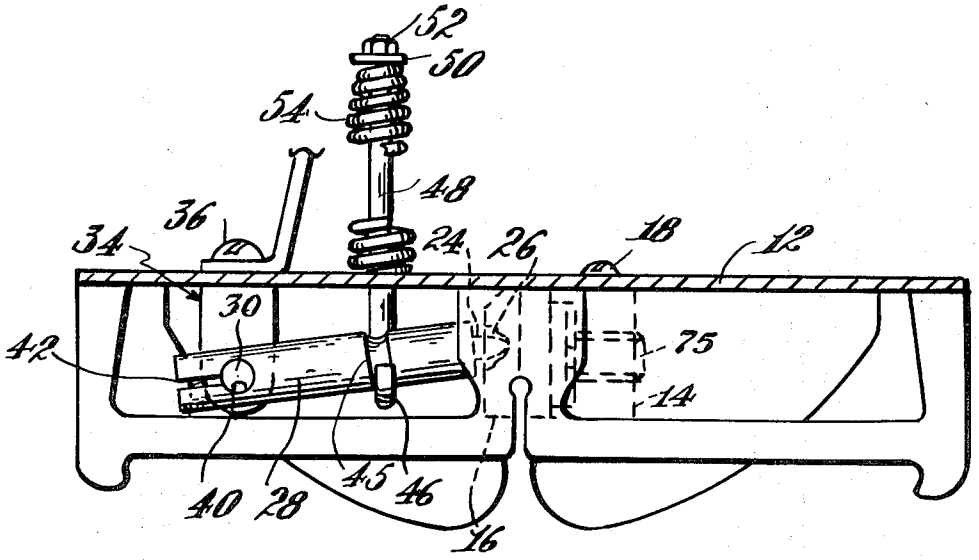


Fig. 3

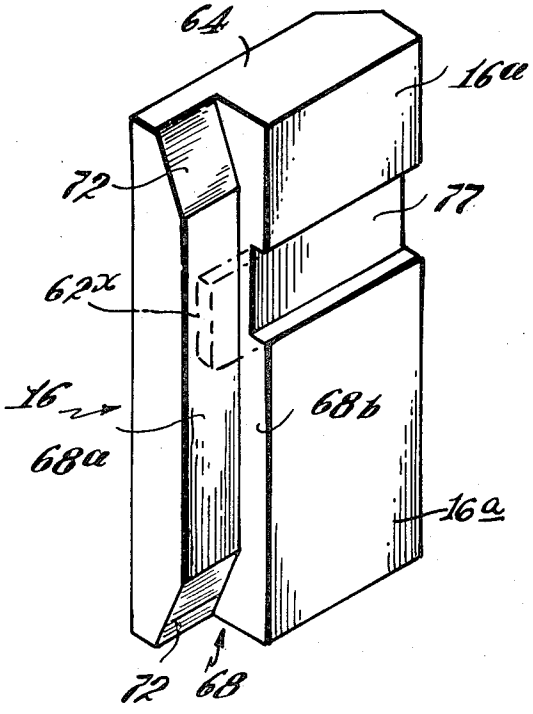


Fig. 5

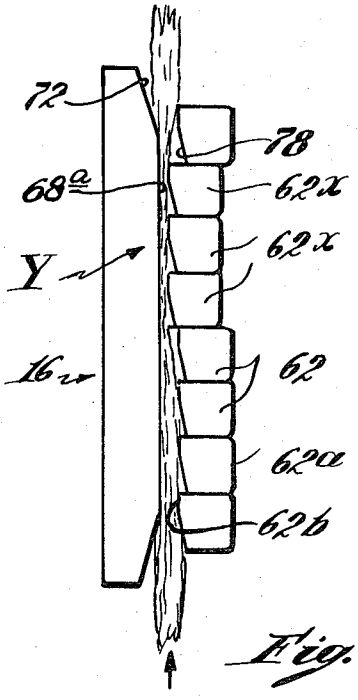


Fig. 6

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3,543,357

SLUB CATCHER

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Int. Cl. D01h 13/22
U.S. Cl. 28—64 14 Claims

ABSTRACT OF THE DISCLOSURE

A slub catcher embodying a yarn passage of a width such as to permit unobstructed passage of yarn but to intercept slubs and other enlargements in the yarn, and a member extending part way across the passage near the end from which the yarn leaves which, by engagement with the yarn, maintains tension in the yarn leaving the slub catcher.

BACKGROUND OF THE INVENTION

The slub catcher herein illustrated is of the kind shown in my Pats. 2,623,265, 2,625,732, 2,640,252, 2,732,610, 2929,129, 2,958,922, 2,963,769 and 3,254,388, comprising a pair of blocks having flat confronting surfaces yieldingly held in engagement, one of the blocks containing in its surface a recess extending longitudinally thereof, one side of which is spaced from and parallel to the confronting surface of the other block and in conjunction therewith providing a narrow yarn passage. The slub catchers shown in these patents are designed to provide a passage wide enough to permit yarn of normal diameter to pass freely through them but too narrow to permit slubs or other enlargements in the yarn to pass. It is possible by adjustment to increase or decrease the resistance to movement of the yarn through the yarn passage thus to selectively eliminate slubs of predetermined size and to permit slubs of smaller size to pass through without breakage of the yarn and by providing yarn passages which are relatively long to be quite selective. Under normal conditions a long yarn passage provides enough surface contact with the yarn and hence running friction to maintain tension in the yarn as it leaves the slub catcher without need for ancillary tension-producing means. However, when the walls of a passage are separated by adjustment to permit passage of large slubs, much of the friction is lost so that there may not be enough tension in the yarn leaving the slub catcher to insure good winding conditions. It is accordingly the purpose of this invention to provide, in conjunction with slub catchers of the kind disclosed in the aforesaid patents and in particular the slub catcher disclosed in Pat. 3,254,388, means for retarding the yarn as it passes through the yarn passage, even though the walls of the passage are widely set, which by frictional engagement with the yarn will provide sufficient tension as the yarn leaves the slub catcher so that no accessory tensioning device or devices need be used. Other objects are to provide a tensioning device for use in conjunction with a slub catcher which is simple in construction, can be incorporated in the slub catcher without substantial modification thereof, is adjustable to enable obtaining the desired tension without production of excessive fly, and which will not substantially increase the occurrence of breakage.

SUMMARY

As herein illustrated, the slub catcher embodies members having confronting spaced parallel surfaces which define an elongate yarn passage aligned with the direction of travel of the yarn. One of the surfaces is yieldably supported relative to the other so as to permit yarn of normal diameter to flow freely through the passage but to intercept and trap enlargements and there is means for adjusting the yield of the yieldably supported surface to enable selectively eliminating slubs of a predetermined size while permitting slubs of lesser size to pass through. In accordance with this invention, there is provided in conjunction with the aforesaid members means projecting from the one surface toward the other which forms a constriction in the yarn passage through which the yarn is compelled to pass as it travels through the yarn passage. The aforesaid means comprises a part projecting into the passage and constitutes a deviation which causes the yarn to change course and hence have added contact with the walls of the yarn passage thereby increasing its frictional contact therewith; is yieldingly supported between the surfaces of the blocks; and is adjustably resistant to yield in conjunction with the surface from which it projects. As illustrated, one of the blocks contains a channel at right angles to the axis of the yarn passage and the other contains a plurality of narrow blades also at right angles to the axis of the yarn passage, the surfaces of which collectively form one side of the yarn passage. The bottom of the channel is situated intermediate the side walls of the yarn passage at a predetermined distance from the side wall of the yarn passage embodied in the one block and preferably closer to the end of the yarn passage from which the yarn leaves than to the entrance thereto, and the aforesaid part comprises one at least of the blades which projects into and bottoms against the bottom of the channel.

The invention will now be described in greater detail with reference to the accompanying drawings wherein:

FIG. 1 is a front elevation of the slub catcher;

FIG. 2 is a side elevation of FIG. 1;

FIG. 3 is a plan view of the slub catcher shown in FIG. 1;

FIG. 4 is an enlarged perspective of the fixed block;

FIG. 5 is an enlarged perspective of the movable block; and

FIG. 6 is an enlarged elevation showing the course of the yarn through the yarn passage of the slub catcher.

The slub catcher **10**, as herein illustrated, is mounted on the vertical portion of the apron **12** of a winding unit such as illustrated in Pat. 2,623,265, and comprises a pair of elongate blocks **14** and **16**, the block **14** being disposed in an upright position and removably fixed to the apron by means of screws **18**. The block **16** is mounted next to the block **14** in a similar upright position with its upper and lower ends supported between vertically spaced bearing plates **20** and **22**, so that it can slide forwardly and rearwardly relative to the block **14**. The bearing plates **20** and **22** are secured to the apron **12** by suitable means not shown.

The blocks **14** and **16** are held yieldably engaged by a pair of spring-pressed plungers **24—24** supported in vertically spaced relation in engagement with recesses **26—26** in the outer side of the block **16** by a pair of vertically spaced arms **28—28** mounted on a vertically disposed rod **30**. The rod **30** is rotatably mounted in vertically spaced bearings **32—32** which project forwardly from the bearing bracket member **34** secured to the apron by screws **36**. The lower end of the rod **30** has a right-angularly disposed supporting arm **38** which extends rearwardly beneath the lower edge of the apron by means of which it may be rotated. The arms **28—28** have vertically disposed holes **40—40** adapted to receive the rod **30** and are bifurcated at **42—42** and provided with threaded openings to receive clamp bolts **44—44** for clamping the arms to the rod. The arms also contain shallow peripheral grooves **45—45** for receiving a hook **46** having a shank **48** which extends rearwardly through the apron. The rear end of the shank has on it a washer **50** backed up by a nut **52** threaded onto it and a coiled spring **54** is mounted

on the shank between the washer **50** and the rear side of the apron, the spring operating to urge the arms **28—28** rearwardly and hence to hold the block **16** in a rearwardly displaced position, permitting the block, however, to be moved forwardly relative to the block **14** by rotation of the rod **30** to effect clearing of the yarn passage between the blocks.

The blocks **14** and **16** comprise fixed and movable assemblies having flat, yieldingly engaged surfaces and spaced parallel confronting surfaces forming a narrow yarn passage Y (FIGS. 1 and 6), the axis of which is disposed in the direction of travel of the yarn.

The fixed assembly **14**, as disclosed in the aforesaid Pat. 3,254,388, is in the form of a generally rectangular block **56** (FIG. 4) provided with flat surfaces **14***a*—**14***a* for engagement with the movable assembly and contains a substantially rectangular cavity **56***a* which faces or confronts the movable assembly **16**. In this cavity there are mounted a backing plate **58**, a resilient cushion **60** and a plurality of narrow, independently mounted blades **62** arranged one above the other in parallel contacting relation, with their outer surfaces **62***a* in engagement with the resilient cushion and their inner surfaces **62***b* collectively forming a substantially flat surface confronting the assembly **16**.

The movable assembly comprises a block **64** (FIG. 5) provided with flat surfaces **16***a*—**16***a* for engagement with the fixed assembly **14** and is yieldingly held in engagement with the fixed assembly by the aforesaid spring plungers **24—24**. The forward edges of the two assemblies coincide and the block **64** contains at its forward edge a recess or cut-back portion **68** (FIG. 5) which extends longitudinally thereof, providing a flat surface **68***a* parallel to the surfaces **16***a*—**16***a* and a flat surface **68***b* which is perpendicular to the surface **16***a*. The surface **68***a* is spaced from and parallel to the inner sides of the blades **62** and the surface **68***b* is at right angles thereto and forms in conjunction with the blades one side and the bottom of the yarn passage Y, the opposite side of which is constituted by the inner sides of the blades. The ends of the recess **68** are beveled to provide divergent surfaces **72—72** at the ends of the yarn passage to facilitate ingress and egress of the yarn to and from the passage without danger of breaking, fraying and/or the formation of fly.

As thus constructed, the yarn passage Y like the yarn passage shown in the patent referred to above is substantially uniformly wide so as to permit free passage of the yarn through it but to intercept slubs and other enlarged portions of the yarn which should be removed. The elongate spaced parallel surfaces of the yarn passage afford a sufficient amount of contact with the yarn under normal operating conditions to frictionally retard the yarn and hence to eliminate the need for ancillary tension means.

A screw **75** threaded into the block **56** against the outer side of the plate **58** provides for increasing the resistance of the cushion **60** to yield. If the screw is backed off to allow the blades **62** to yield and hence to allow the passage of relatively large slubs, as, for example, when their presence is not detrimental so much of the frictional engagement of the yarn with the walls of the yarn passage is lost that no tangible amount of tension is present in the yarn leaving the slub catcher. To rectify this situation without having to provide auxiliary tensioning devices the slub catcher disclosed herein is provided with tensioning means comprising a part which projects into the yarn passage from the fixed assembly **14** toward the movable assembly **16**, the purpose of which is to form a deviation and constriction in the yarn passage which causes the yarn to deviate in its course thus producing increased surface contact of the yarn with the walls of the yarn passage which tends to constrain its movement and thus produce tension in the portion of the yarn leaving the slub catcher.

The part referred to and as herein illustrated is one or more of the blades **62** shown in FIGS. 1 and 6 at **62***x*. Displacement of the blades **62***x* relative to the plane of the inner surfaces **62***b* of the blades into the yarn passage is afforded by providing a channel **77** (FIG. 5) intermediate the flat surface **16***a*—**16***a* of the block **64** at right angles to the recess **68** located near the upper end of the block. The channel **77** is of shallower depth than the recess **68** so that when a blade **62***x* is bottomed against the bottom of the channel its inner surface is spaced from the surface **68***a* to permit the yarn to pass between its inner surface and the surface **68***a* without breakage. The blade **62***x* is yieldably held against the bottom of the channel by the cushion layer **60** and since it projects into the yarn passage causes the yarn to follow a deviating course which increases the surface contact of the yarn with the walls of the yarn passage and tends to retard free passage of the yarn. The blade is narrow in the direction of travel of the yarn and hence while it produces sufficient deviation to impart tension to the yarn it does not afford sufficient restriction to the passage of slubs and/or enlargements to cause breakage.

While the channel **77** as shown (FIGS. 1 and 5) accommodates only one blade **62***x* it may be made wide enough to receive two or more such blades if desired, as illustrated in FIG. 6.

As illustrated, the width of the yarn passage Y is .016 inch and the channel is .008 inch deep so that the blade **62***x* reduces the passage at this point to .008 inch in width. The reason for not making the channel as deep as the yarn passage is wide is that too much fly would be created and the yarn would tend to be pushed out of the yarn passage.

With one blade used out of eight blades available the maximum tension would be approximately ⅛ of that which would be produced by all of the blades. Adjustment of the tension may be obtained by means of the adjusting screw **75**.

As illustrated in the aforesaid patent each blade **62** is beveled at **78** along its lower inner edge so as to minimize stripping the yarn and of creating fly.

It is to be understood that the tension producing means herein illustrated in conjunction with the slub catcher shown in the aforesaid Pat. 3,254,388, wherein a plurality of blades constitute one side of the passage may also be employed in any one of the slub catchers shown in the other patents by providing intermediate the ends of the yarn passage a relatively short passage which will effect deviation of the yarn as it travels through the slub catcher.

It should be understood that the present disclosure is for the purpose of illustration only and that this invention includes all modifications and equivalents falling within the scope of the appended claims.

I claim:

1. The combination with a slub catcher embodying members having confronting spaced parallel surfaces defining an elongate passage of predetermined width through which yarn from which slubs are to be eliminated is drawn, the axis of said passage being aligned with the direction of travel of the yarn; of tension producing means comprising means situated between said surfaces forming a deviation in the passage of less width than said predetermined width through which the yarn is caused to travel and is frictionally retarded so as to produce tension in the yarn leaving the slub catcher.

2. A slub catcher according to claim **1**, wherein said means is yieldably supported between the members at a predetermined distance from one side of the passage and forms in conjunction with said one side a relatively short obstruction situated laterally of and parallel to the longitudinal center line of the yarn passage through which the yarn is caused to pass.

3. A slub catcher according to claim **1**, wherein said means comprises a part supported from one member and extending therefrom toward the other, means yieldingly urging the part toward said other member, and means

on said other member limiting movement of the part toward said member to a position spaced therefrom said predetermined distance.

4. A slub catcher according to claim 1, wherein the surface of the part confronting the approaching yarn slopes from the one side of the yarn passage toward the other in the direction of travel of the yarn.

5. A slub catcher comprising members having yieldably engaged confronting surfaces, one of said surfaces containing a longitudinal groove and a channel at right angles thereto of lesser depth than the groove so that the bottom of the channel is at a predetermined distance from the bottom of the groove, the bottom of the groove forming in conjunction with said surface of the other member a yarn passage, and a part supported in the channel between the members in engagement with the bottom of the channel and extending therefrom across the passage, said part constituting a barrier projecting from said surface of said other member toward the surface of the one member around which the yarn is caused to pass as it travels through the yarn passage.

6. A slub catcher according to claim 5, comprising means yieldingly holding the part against the bottom of the channel.

7. A slub catcher according to claim 5, comprising means yieldingly holding the part against the bottom of the channel and means for varying the resistance of said yieldable means to yielding.

8. The combination with a slub catcher comprising members having yieldably engaged confronting surfaces between which there is a longitudinal yarn passage having a bottom and spaced parallel walls, one side of the passage being constituted by the surface of a groove in said one member and the other by the surfaces of a plurality of narrow abutting blades supported by the other member at right angles to the longitudinal axis of the passage; characterized in that the one member contains a channel confronting and parallel to the blades of lesser depth than the width of the passage, and one of the blades extends into and bottoms against the bottom of the channel.

9. A slub catcher according to claim 8, wherein the blades are yieldably supported on said other member.

10. A slub catcher according to claim 8, wherein the blades are yieldably supported on said other member and there is adjustable means operable to increase or decrease the resistance of the blades to yield.

11. A slub catcher according to claim 8, wherein the channel is wider than the blades and at least two blades extend into and bottom against the bottom of the channel.

12. A slub catcher comprising members having flat yieldingly engaged surfaces and edges, one of said members containing in its surface at its edge a groove, one side of which is parallel to the surface of the other member, and the other side of which is perpendicular thereto, said groove running lengthwise of the member and forming in conjunction with the surface of the other member a narrow, longitudinal yarn passage, said other member containing in its surface a plurality of yieldably mounted narrow blades parallel to the one side of the groove and perpendicular to the other side, said one member containing in its surface a channel which is parallel to and intersects the groove, the bottom of the channel being situated between the sides of the passage at a predetermined distance from said one side of the groove, and one of the blades extending from the other member into the channel against its bottom and constituting a deviation in the yarn passage.

13. A slub catcher according to claim 12, comprising resilient means supported back of the blades yieldably holding the blades against the surface of the one member, and said one blade against the bottom of the channel.

14. A slub catcher according to claim 12, comprising resilient means supported behind the blades yieldably holding each blade independently of the other against the surface of the one member and the one blade against the bottom of the channel, a rigid plate engaged with the resilient means and a screw operably engaged with the plate operable to move the rigid plate toward or away from one member to increase or decrease the resistance of the resilient means to displacement.

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LOUIS K. RIMRODT, Primary Examiner