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H. OWENS ET AL

2,266,900

SLUB CATCHER FOR MULTIPLE STRANDS

Filed Jan. 8, 1940

Fig. 1.

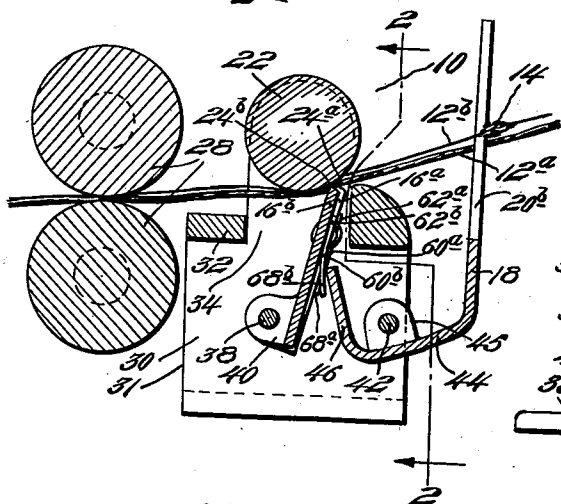


Fig. 2.

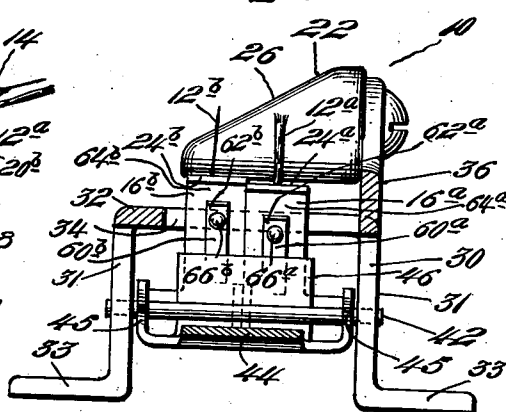


Fig. 3.

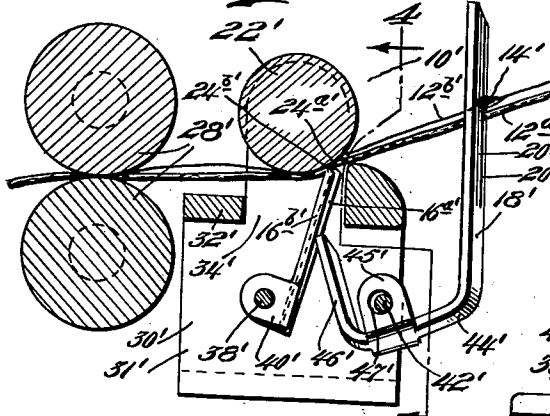
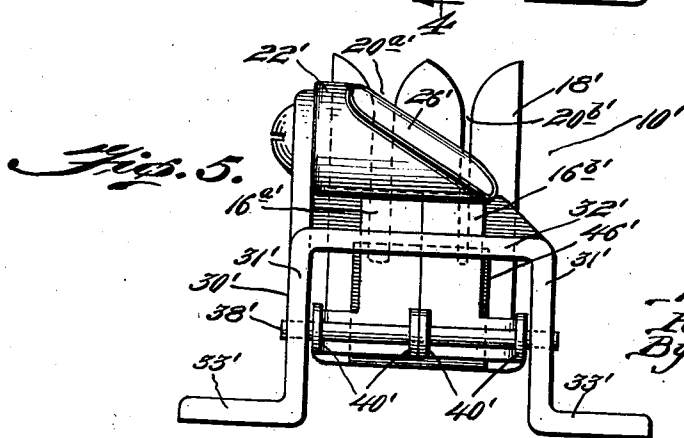
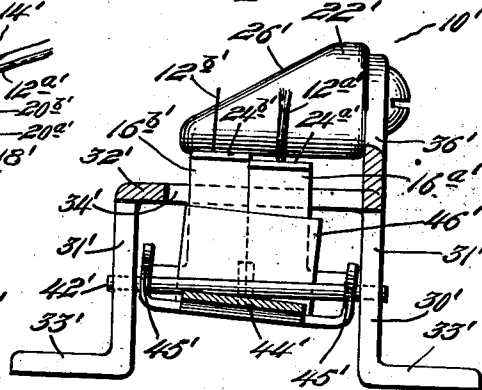


Fig. 4.



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SLUB CATCHER FOR MULTIPLE STRANDS

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Application January 8, 1940, Serial No. 312,914

9 Claims. (Cl. 28—64)

Our invention relates to improvements in slub catchers for use in twisting, winding, doubling or like machines, being an improvement on the specific type of slub catcher shown in the copending application of Henry Owens, one of the joint inventors herein, Ser. No. 309,213, filed December 14, 1939, for Slub catcher adapted for use with a plurality of strands which may have slubs therein, particularly for twisting or doubling said strands.

In general, the objects of the invention are the same as set forth in said application, namely, to provide a device which may be used directly on a doubling or twisting machine, eliminating the intermediate winding step formerly thought necessary. The invention shown in said application works very nicely when all the strands being twisted or doubled are of substantially the same diameter. When, however, the strands being so twisted or doubled are not of substantially the same diameter, the device shown in said patent is not fool-proof in its action and the present invention aims to provide a device which will be fool-proof in its action with variations in diameter of the strands being doubled or twisted, such as where it is desired to twist a thick yarn or roving with a thin thread or core as is often desired in making flannel or blanket fabrics where a fine thread core is twisted relative to a heavy roving for napping purposes, or where it is desired to produce fancy yarns of different size strands.

Further features of our invention relate to improvements in the construction of the slub catcher which will positively function to break all the strands, whether of the same diameter or of different diameters, which is simple in design, constructed of a simple number of rugged parts, positive in their action and in which the operating parts are normally concealed within a frame, thereby substantially lessening the liability of objectionable lint, oil, etc. so often present in textile mills clogging the operation of the slub catcher or injuring the strands produced.

These and such other objects of our invention as may hereinafter appear will be best understood from a description of the accompanying drawing, which illustrates various embodiments thereof.

In the drawing, Fig. 1 is a longitudinal sectional view taken through one embodiment of our device along one edge of the frame thereof and adjacent draft roll portions with the slub catcher functioning to break all said strands.

Fig. 2 is a vertical sectional view taken along

the line 2—2 of Fig. 1, showing the cutting arms about to cut the respective strands of different diameters.

Fig. 3 is a longitudinal sectional view similar to Fig. 1 taken through a different embodiment of our invention along one edge of the frame thereof and adjacent draft roll portions with the slub catcher functioning to break all said strands.

Fig. 4 is a vertical sectional view taken along the line 4—4 of Fig. 3 showing the cutting arms about to cut the respective strands of different diameters.

Fig. 5 is a front elevation of the embodiment of our invention shown in Figs. 3 and 4.

In the drawing, wherein like characters of reference indicate like parts throughout, 10 and 10' generally indicate embodiments of slub catchers constructed in accordance with our invention.

As stated hitherto, the present invention is an improvement on the embodiment of the invention shown in Figs. 1-4 of said copending application, S. N. 309,213, filed December 14, 1939, of Henry Owens, one of the joint inventors herein, for Slub catcher, and with the exception of the improvements to be described more in detail is fully shown and described in said application to which reference is hereby made for a more detailed description, if desired. We have found in practice that while the embodiment shown in Figs. 1-4 of said application functions successfully to trap a plurality of strands of equal, or substantially equal diameters, that if the strands are of substantially different diameters they will not all be cut by a single trapping or cutting arm. It will help somewhat if individual trapping or cutting arms 16^a and 16^b or 16^{a'} and 16^{b'} are provided for each respective strand 12^a and 12^b, or 12^{a'} and 12^{b'}, but in order to provide a slub catcher which is positive in its action to cut all the strands, we have preferably further modified the device shown in said Owens application in a manner to be described in more detail later.

Both embodiments of slub catchers shown, namely, in Figs. 1 and 2 and in Figs. 3-5, are adapted for use in twisting, winding, spinning or doubling a plurality of strands 12^a and 12^b or 12^{a'} and 12^{b'}, which may have slubs 14 or 14' therein. In both embodiments of our invention we provide cutting means for all said strands. In place of the unitary cutting means shown in said application, we provide a plurality of cutting means 16^a and 16^b or 16^{a'} and 16^{b'} comprising individual

cutting or trapping means for strands of different diameters as the strands 12^a and 12^b or 12^{a'} and 12^{b'} shown. We also provide strand guide means 18 or 18' for said strands preferably constructed of unitary construction and having separate strand apertures 20^a and 20^b or 20^{a'} and 20^{b'} therethrough preferably of different respective widths as shown in Fig. 5 for the respective strands 12^a and 12^b or 12^{a'} and 12^{b'} of different diameters with the entire strand guide means 18 or 18' being movable on contact with a slub 14 or 14' in one of said strands to actuate said strand cutting means 16^a and 16^b or 16^{a'} and 16^{b'} to break all said strands 12^a and 12^b or 12^{a'} and 12^{b'}.

As is shown in Figs. 1-4 of said application, we preferably employ a post 22 or 22' mounted to extend transversely horizontally above the respective strands 12^a and 12^b or 12^{a'} and 12^{b'} and pivotally mounted trapping or cutting means 16^a and 16^b or 16^{a'} and 16^{b'}, each terminating in a trapping or cutting edge 24^a or 24^b, or 24^{a'} or 24^{b'} limited in its forward pivotal or trapping movement by said respective post 22 or 22'. We employ strand guide means 18 or 18' having a plurality of strand receiving slots 20^a and 20^b or 20^{a'} and 20^{b'} in rear of said post so arranged and constructed that on abutment of a slub 14 or 14' in any of said strands 12^a or 12^b, or 12^{a'} or 12^{b'} thereagainst, said strand guide means 18 or 18' may be forced by the respective strand pulling its respective slub 14 or 14' to raise its respective trapping or cutting arms 16^a and 16^b or 16^{a'} and 16^{b'} to cause the cutting edges 24^a and 24^b, or 24^{a'} and 24^{b'} thereof to abut said post 22 or 22' to break all said strands 12^a and 12^b, or 12^{a'} and 12^{b'}. It will be noted that the respective slots 20^a and 20^b or 20^{a'} and 20^{b'} are of a width to accommodate the respective strands 12^a and 12^b or 12^{a'} and 12^{b'} to permit their respective passage therethrough without friction but that when a slub of a greater diameter than the usual diameter of the respective strand or its respective slot attempts to pass therethrough, the edges of said slub 14 exterior of said slot will abut the edges of the guide means adjacent the slot to raise the unitary guide means 18 or 18'.

It is thus obvious that both the trapping or cutting means and the strand guide means are mounted below the post 22 or 22' in a position out of the way of the operation of the draft or twisting operation of the machine on which the slub catcher is mounted and to permit the ready insertion of a strand or strands therein. As shown in said Owen's application, to hasten this threading movement the outer end of the post 22 or 22' is preferably downwardly tapered as at 26 or 26' and the respective guide slots 20^a and 20^b or 20^{a'} and 20^{b'} are located in rear of the downwardly tapered outer end 26 or 26' of said transverse post 22 or 22'. To thread the slub catcher, therefore, it is apparent that it is merely necessary to place the respective strands 12^a and 12^b or 12^{a'} and 12^{b'} in their respective guide slots 20^a and 20^b or 20^{a'} and 20^{b'} and thread the ends thereof in the twisting or draft means such as illustrated by the draft rolls 28 or 28' when on rotation of the rolls in the actual textile operation, the respective strands will be pulled taut and slid off the respective downwardly tapered outer end 26 or 26' of the respective post 22 or 22' to assume a position underneath the respective post in line with their respective slots 20^a and 20^b, or 20^{a'} and 20^{b'} between the respec-

tive cutting edges 24^a and 24^b, or 24^{a'} and 24^{b'} and the respective posts 22 or 22'. It is thus obvious that the forward pivotal movement of the respective pivotally mounted cutting or trapping means 16^a and 16^b, or 16^{a'} and 16^{b'} is limited by its respective post 22 or 22'.

In order that the operating parts of my device may be further concealed and removed from the objectionable lint, I preferably mount the post 22 or 22' on a frame 30 or 30' preferably of inverted U-shape mounted transversely of said machine in rear of said draft or twisting means 26 or 26'. The raised U-base 32 or 32' is provided with a central slot 34 or 34' over which said strands 12^a and 12^b or 12^{a'} and 12^{b'} are adapted to pass and each U-leg 31 or 31' thereof is provided with the projection 33 or 33' projecting outwardly therefrom for securement thereof to the textile machine by means of screws or otherwise. With this construction, it is obvious that the rear pivotal movement of the respective trapping or cutting means 16^a and 16^b or 16^{a'} and 16^{b'} is limited by the rear edge of the respective transverse slot 34 or 34'.

While either of the type of connections shown in said Owens' application aforesaid between the guide means 18 or 18' and the individual trapping or cutting means 16^a and 16^b or 16^{a'} and 16^{b'} may be employed, we have shown in both embodiments the same type of lost motion connection between the respective guide means 18 or 18' and the cutting or trapping means 16^a and 16^b or 16^{a'} and 16^{b'} as shown in the preferred embodiment illustrated in Figs. 1-4 of said application.

In both embodiments, the post 22 or 22' is mounted on an extension 36 or 36' projecting upwardly from said U-shaped frame. In both embodiments the pivot pin 38 or 38' is mounted transversely of said frame below the post 22 or 22' and the trapping or cutting means in both embodiments comprises the individual trapping or cutting arms 16^a and 16^b or 16^{a'} and 16^{b'} pivotally mounted on said respective pivot pin 38 or 38' extending upwardly through the transverse slot 34 or 34' and terminating in the trapping or cutting edge 24^a or 24^b, or 24^{a'} or 24^{b'} respectively below said respective post 22 or 22' adjacent the respective strands 12^a or 12^b, or 12^{a'} or 12^{b'} which are respectively limited in their rearward pivotal movement by the rear edge of the transverse slot 34 or 34' and in their forward pivotal trapping or cutting movement by said respective post 22 or 22'. Suitable pivot ears 40 or 40' are provided on said upwardly extending trapping or cutting arms 16^a and 16^b or 16^{a'} and 16^{b'} for pivotal mounting thereof on said respective pivot pin 38 or 38'. In both embodiments, we mount a second pivot pin 42 or 42' transversely of said frame 30 or 30' in rear of said first pivot pin 38 or 38' and we pivotally mount the guide lever or single unitary guide means 44 or 44' on said second pivot pin 42 or 42' in rear of said respective trapping or cutting arms 16^a and 16^b or 16^{a'} and 16^{b'} having the respective work arm 46 or 46' projecting upwardly and forwardly therefrom to abut said trapping arms 16^a and 16^b, or 16^{a'} and 16^{b'} to advance them and the respective power arm 18 or 18' having a plurality of strand receiving guide slots or apertures 20^a and 20^b or 20^{a'} and 20^{b'} therein in rear of the downwardly tapered outer end 26 or 26' of said post 22 or 22' adapted on abutment of a slub 14 or 14' in any of said

strands 12^a or 12^b, or 12^{a'} or 12^{b'} thereagainst to move said guide means power arm 18 or 18' and its respective integral work arm 46 or 46' to abut said trapping or cutting arms 16^a and 16^b or 16^{a'} and 16^{b'} to raise them against said post 22 or 22' to break all said strands. The lever 44 or 44' is provided with the suitable ears 45 or 45' for mounting on said pivot pin 42 or 42'.

We have found in practice that, even if two cutting arms are employed in said embodiment of said Owens' application that the respective work arm 46 employed in the embodiment shown in Figs. 1-4 of said application, or the cutting or trapping arm 16' employed in the embodiment shown in Figs. 5 and 6 of said application will not function to urge the respective cutting or trapping edges against the respective strands of smaller diameter to positively trap or cut them in all instances, particularly where strands of widely varying diameters are employed. Our present invention broadly comprises means permitting relative yielding movement between said unitary strand guide means 18 or 18' and said individual cutting or trapping means 16^a and 16^b, or 16^{a'} and 16^{b'} operative on abutment of a slub in any of said strand guide apertures 20^a or 20^b, or 20^{a'} or 20^{b'} raising its respective guide means 18 or 18' to cause it to positively move all said cutting or trapping means 16^a and 16^b or 16^{a'} and 16^{b'} to break all strands.

In the embodiment shown in Figs. 1 and 2 of this application, said means permitting relative yielding movement comprises resilient means for this purpose comprising spring means mounted on the rear surface of each individual trapping or cutting arm 16^a or 16^b. While any suitable type of spring means may be employed, in our preferred embodiment, we employ a leaf spring 60^a or 60^b having the upper end 62^a or 62^b thereof secured to the upper end of the rear surface 64^a or 64^b of its respective trapping or cutting arm 16^a or 16^b in any suitable manner as by the rivets 66^a or 66^b and having the lower end 68^a or 68^b thereof projecting downwardly therefrom to be normally spaced from its respective cutting or trapping arm 16^a or 16^b opposite the upper end of the work arm 46 and bendable towards said respective rear surface of its respective arm when abutted by said work arm 46, as illustrated in Fig. 1 of the drawing. It is obvious that after the work arm 46 has functioned to move the trapping or cutting arm 16^a to break the respective strand 12^a of larger diameter, on further movement of the work arm 46 the spring 60^a may be further compressed until the work arm 46 also abuts the portion 68^b of the spring 60^b to cause it to actuate the trapping or cutting arm 16^b to break the strand 12^b.

In the embodiment shown in Figs. 3 and 4, the yieldable means for this purpose comprises yieldable mounting means for the guide lever 44' comprising the unitary strand guide means 18' permitting such relative yielding movement between said unitary strand guide means 18' and said individual cutting or trapping means 16^{a'} and 16^{b'} operative on abutment of a slub in any of said strand apertures 20^{a'} or 20^{b'} raising said guide means 18' to cause it to positively move all said cutting or trapping means to break all said strands. In the embodiment shown in Figs. 3-5, this yieldable movement is accomplished by loosely pivotally mounting the guide lever 44' including the unitary strand guide means 18' on said frame to have an end thereof pivot longitudinally relative to the other end permitting the

guide lever 44' to longitudinally tilt on abutment of a slub in any of said strands thereagainst to raise all said trapping or cutting arms against said post to break all said strands. In the embodiment shown, this is accomplished by merely enlarging the holes 47' in the ears 45' for mounting of the lever 44' on the pivot pin 42' and it is obvious that with this construction the entire lever 44' will tilt to cause the work arm 46' thereof to similarly contact each of the individual cutting or trapping arms 16^{a'} and 16^{b'} to cause them to positively break both the strands 12^{a'} and 12^{b'}. It is apparent that substantially the same result may be achieved by a single cutting arm, as shown in Figs. 5 and 6 of said Owens' application, such as by enlarging similar holes in the ears for pivotally mounting the guide lever shown therein, on such similar pivot pin. We have found in practice, however, that the device works more perfectly if individual trapping arms are employed.

It is apparent that we have provided a novel type of slub catcher adapted for use for doubling or twisting a plurality of strands of different diameters which will positively function to break all said strands no matter how great the variation in diameter thereof, constructed of a small number of simple parts positive in their action.

We employ the word "post" in the claims to include any type of rigidly mounted member against which the cutting or trapping means may function to break a plurality of strands. While we have shown a slub catcher adapted for use for twisting two strands into a single strand, it is obvious that it may be suitably modified to twist any number of strands into a single strand.

It is understood that our invention is not limited to the specific embodiments shown and that various deviations may be made therefrom without departing from the spirit and scope of the appended claims.

What we claim is:

1. A slub catcher for use in twisting, winding, spinning or doubling machines, acting on a plurality of strands of different diameters, comprising individual cutting or trapping means for strands of different diameters, pivotally mounted unitary strand guide means having strand apertures of a size to normally permit passage of said strands therethrough, so constructed that abutment of a slub in any of said strand guide apertures may initially move said guide means to cause it to move all said individual cutting or trapping means until one of said cutting or trapping means abuts its respective strand and in a continued movement subsequently move said guide means until it causes the remaining individual cutting or trapping means to successively abut their respective strands and thereafter in the same continued movement move said guide means to actuate all said cutting or trapping means to break all said strands.

2. A slub catcher for use in twisting, winding, spinning or doubling machines, acting on a plurality of strands of different diameters, comprising individual cutting or trapping means for strands of different diameters, unitary strand guide means having strand apertures of a size to normally permit passage of said strands therethrough and resilient means permitting relative yielding movement between said unitary strand guide means and said individual cutting or trapping means operative on abutment of a slub in any of said strand guide apertures raising said guide means to cause it to positively move all

said cutting or trapping means to break all said strands.

3. A slub catcher for use in twisting, winding, spinning or doubling machines, acting on a plurality of strands of different diameters, comprising individual cutting or trapping means for strands of different diameters, unitary strand guide means having strand apertures of a size to normally permit passage of said strands therethrough and loosely mounting means for said unitary strand guide means permitting relative yielding movement between said unitary strand guide means and said individual cutting or trapping means operative on abutment of a slub in any of said strand guide apertures raising said guide means to cause it to positively move all said cutting or trapping means to break all said strands.

4. A slub catcher for use in twisting, winding, spinning or doubling machines, acting on a plurality of strands of different diameters, comprising cutting or trapping means for strands of different diameters, unitary strand guide means having strand apertures of a size to normally permit passage of said strands therethrough and loosely mounting means for said unitary strand guide means permitting relative tilting movement of said cutting or trapping means operative on abutment of a slub in any of said strand guide apertures raising said guide means to cause it to positively move said cutting or trapping means to break all said strands.

5. A slub catcher for use in twisting, winding, spinning or doubling machines having twisting or draft means, acting on a plurality of strands of different diameters, comprising a post adapted to be mounted to extend transversely horizontally above said strands, individual pivotally mounted cutting or trapping means for strands of different diameters, each terminating in a cutting or trapping edge below said post adjacent said strands, spring means mounted on the rear surface of each individual cutting or trapping means and pivotally mounted unitary strand guide means having a plurality of strand receiving apertures in rear of said post of a size to normally permit passage of said strands therethrough adapted on abutment of a slub in any of said strands thereagainst to abut said spring means to yieldingly actuate all said cutting or trapping means to break all said strands despite variations in diameter of said strands.

6. A slub catcher for use in twisting, winding, spinning or doubling machines having twisting or draft means, acting on a plurality of strands of different diameters, comprising an inverted U-shaped frame adapted to be mounted on said machine transversely in rear of said twisting or draft means having a central transverse slot therein over which said strands are adapted to pass and a post mounted on one side thereof to extend transversely horizontally over said slot above said strands, a pivot pin mounted transversely of said frame below said post, a plurality of individual trapping or cutting arms for strands of different diameters pivotally mounted on said pivot pin each extending upwardly through said frame transverse slot and terminating in a trapping or cutting edge below said post adjacent its respective strand limited in its rear independent pivotable movement by the rear edge of said transverse slot and in its forward independent pivotable trapping or cutting movement by said post, each cutting or trapping arm having a spring mounted on the rear surface thereof with

a portion normally spaced therefrom and bendable towards said surface, a second pivot pin mounted transversely of said frame in rear of said first pivot pin, a single guide lever pivotally mounted on said second pivot pin in rear of said trapping or cutting arm having a work arm projecting upwardly and forwardly therefrom and a power arm having a plurality of strand receiving apertures of a size to normally permit passage of said strands therethrough adapted on abutment of a slub in any of said strands thereagainst to move said work arm to abut said spring portions to yieldingly positively actuate all said trapping or cutting arms against said post to break all said strands despite variations in diameter of said strands.

7. A slub catcher for use in twisting, winding, spinning or double machines having twisting or draft means, acting on a plurality of strands of different diameters, comprising, a post mounted to extend transversely horizontally above said strands, individual pivotally mounted cutting or trapping means each terminating in a trapping or cutting edge below said post limited in its independent forward pivotal trapping or cutting movement by said post and unitary strand guide means having a plurality of strand receiving apertures in rear of said post of a size to normally permit passage of said strands therethrough loosely pivotally mounted to have an end thereof to longitudinally tilt on abutment of a slub in any of said strands thereagainst to raise all said trapping or cutting arms against said post to break all said strands.

8. A slub catcher for use in twisting, winding, spinning or doubling machines having twisting or draft means, acting on a plurality of strands of different diameters, comprising, an inverted U-shaped frame adapted to be mounted on said machine transversely in rear of said twisting or draft means having a central transverse slot over which said strands are adapted to pass, a post mounted on one side thereof to extend transversely horizontally over said slot above said strands, a pivot pin mounted transversely of said frame below said post, a plurality of individual trapping or cutting arms for strands of different diameters pivotally mounted on said pivot pin, each extending upwardly through said frame transverse slot and terminating in a trapping or cutting edge below said post adjacent the strands limited in its independent rearward pivotable movement by the rear edge of said transverse slot and in its independent forward pivotable trapping or cutting movement by said post, a second pivot pin mounted transversely of said frame in rear of said first pivot pin, a single guide lever loosely pivotally mounted on said second pivot pin to have an end thereof move longitudinally relative to the other end in rear of said trapping or cutting arms having a work arm projecting upwardly and forwardly therefrom to abut said trapping or cutting arms to advance them and a power arm having a plurality of strand receiving apertures in rear of said post of a size to normally permit passage of said strands therethrough adapted on abutment of a slub in any of said strands thereagainst to longitudinally tilt to move the work arm thereof to abut all said trapping or cutting arms to raise them against said post to break all said strands.

9. A slub catcher for use in twisting, winding, spinning or doubling machines, acting on a plurality of strands of different diameters, compris-

ing cutting or trapping means for strands of different diameters, unitary strand guide means having strand apertures of a size to normally permit passage of said strands therethrough and loosely mounting means for said unitary strand guide means permitting successive actuating movement of different portions of said cutting or

trapping means operative on abutment of a slub in any of said strand guide apertures raising said guide means to cause it to positively move said cutting or trapping means to break all said strands.

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