Dec. 30, 1952 E. J. ABBOTT 2,623,265

SLUB CATCHER

Filed Oct. 19, 1948 2 SHEETS—SHEET 1

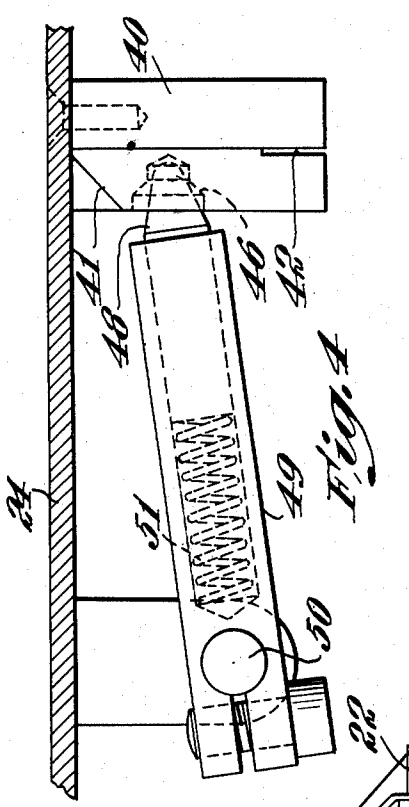

Fig. 4

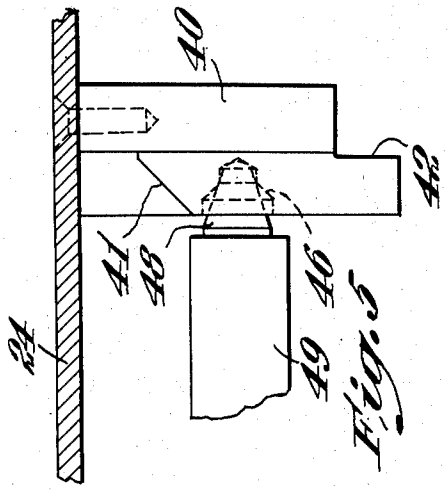

Fig. 5

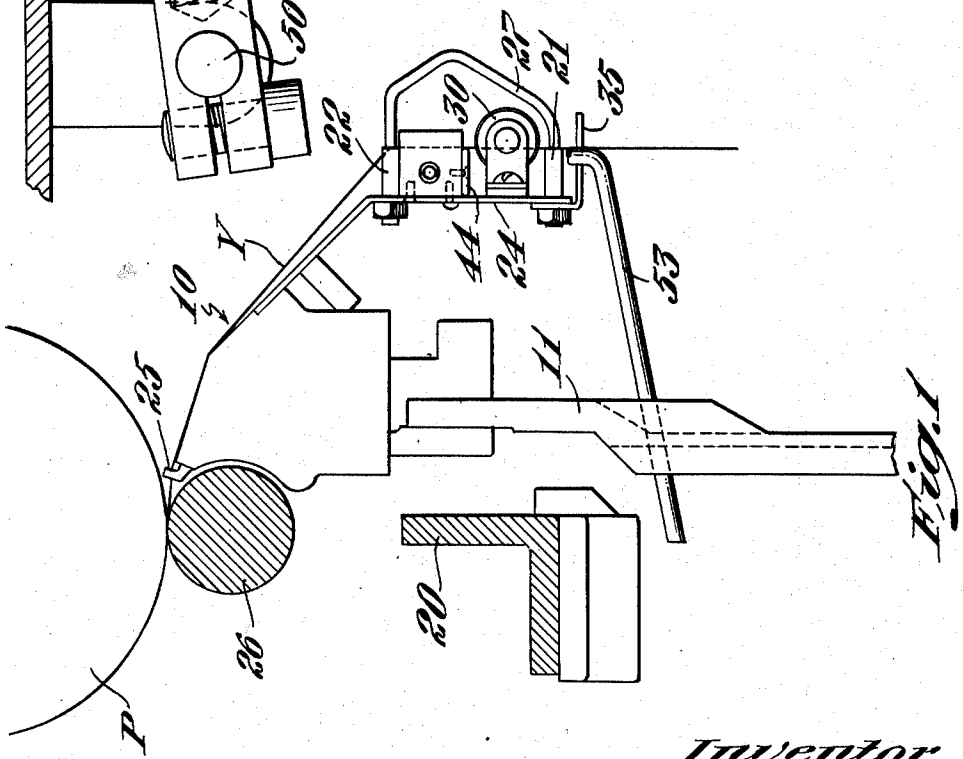

Fig. 1

Inventor
Edward J. Abbott
by Pobst, Cushman & Glover
Attys.

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SLUB CATCHER

Filed Oct. 19, 1948 2 SHEETS—SHEET 2

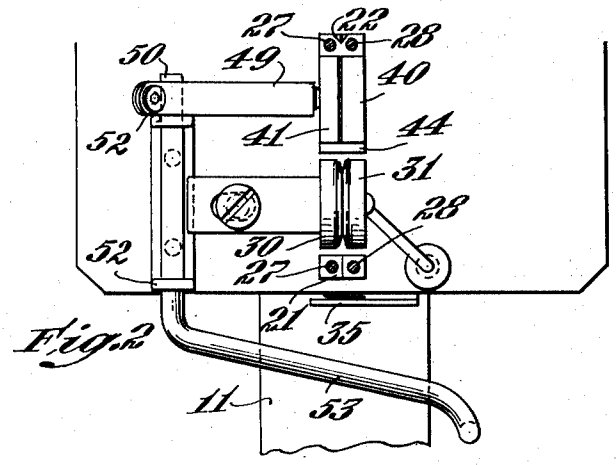

Fig. 2

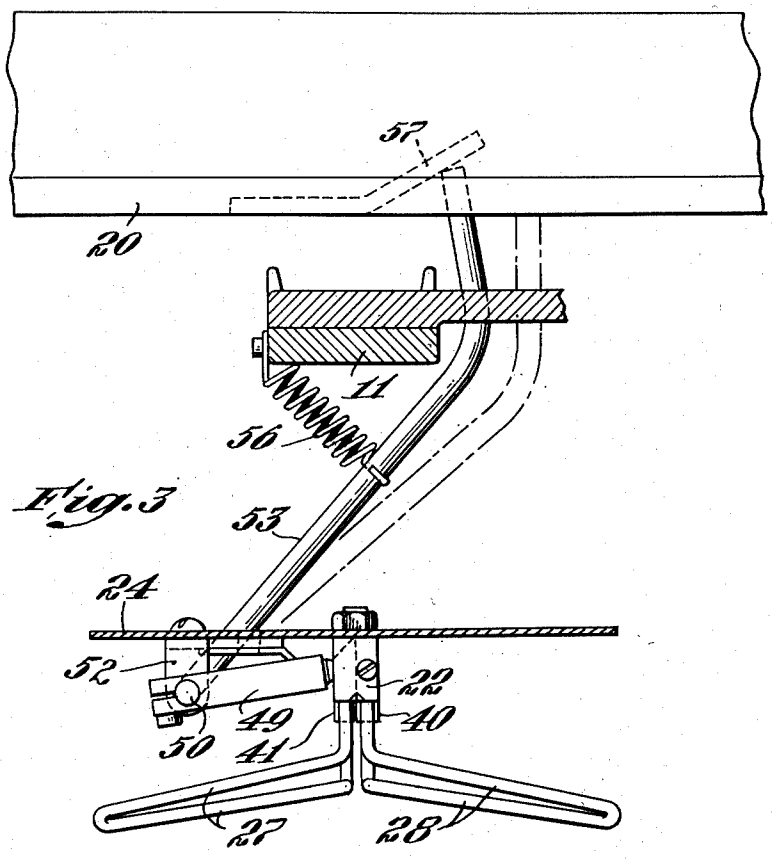

Fig. 3

Inventor
Edward J. Abbott
by Roberts, Cushman & Grover
Attys.

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UNITED STATES PATENT OFFICE

2,623,265

SLUB CATCHER

Edward J. Abbott, Wilton, N. H., assignor, by mesne assignments, to Abbott Worsted Mills, Incorporated, Wilton, N. H., a corporation of New Hampshire

Application October 19, 1948, Serial No. 55,303

14 Claims. (Cl. 28—64)

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This invention relates to slub-catchers adapted to break yarn upon encountering an imperfection in the yarn, such for instance as an enlargement such as a slub or an unduly large knot. The invention is particularly applicable to slub-catchers for high speed winding machines in which there is a problem due to the accumulation of waste or fly on and around the slub catcher.

One of the objects of the invention is to provide a slub-catcher that is automatically self-cleaning. Another object is to provide for periodically opening the yarn passage of the slub-catcher and for cleaning the slub-catcher without allowing waste or fly to enter in between the elements of the slub-catcher.

Further objects of the invention are to provide a construction in which the yarn passage can be accurately defined and maintained at the desired width and in which the width of the yarn passage can be readily altered by change of one of the elements in a quick and easy manner.

Further objects of the invention and advantageous features will be apparent from this specification and its accompanying drawings in which the invention is explained by the description of a preferred example thereof.

In the drawings,

Fig. 1 is a left-hand view, partly in vertical section, of a portion of a winding machine and showing in left elevation the head portion of a traveling winding unit;

Fig. 2 is a fragmentary front elevation of a portion of the head of the winding unit of Fig. 1 including a slub-catcher of the present invention;

Fig. 3 is a diagrammatic view partly in plan and partly in horizontal section showing a portion of the head of the winding unit, including a slub-catcher, and operating mechanism for the slub-catcher cooperating with the frame of the winding machine;

Fig. 4 is a diagrammatic view, to a larger scale than the previous figures, showing the slub-catcher in plan view in its normal operation condition, and

Fig. 5 is a view similar to Fig. 4 showing the slub-catcher with its yarn passage open.

Although of general applicability in the textile industry, the slub-catcher of the present invention will be illustrated by way of example as applied to a traveling spindle winding machine such for instance as the automatic winding machine of copending application Serial No. 26,329, filed May 11, 1948, comprising a large number

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of traveling winding units, such as shown in Fig. 8 of that application, adapted to wind yarn during their travel in a closed path around the machine.

The head portion 10, and upright portion 11, of such a winding unit, and the upper rail 20 of the track of such machine, are shown in Fig. 1, and it will be understood that the winding unit travels along the track 20, toward the observer in Fig. 1 and toward the left in Figs. 2 and 3.

As shown in Fig. 1, yarn Y, coming from a suitable supply bobbin at the lower portion of the traveling unit runs generally upwardly and in contact with the outer faces of yarn guide blocks 21 and 22 which extend outwardly from an apron plate 24 at the head of the winding unit, and thence runs on an inclined path to a reciprocating thread guide 25 and thence onto a winding package P which is rotated by frictional contact with a drive roll 26. A pair of guide rods 27, 28 are secured to both of the guide blocks 21 and 22 and lie closely adjacent at these guide blocks so as to center the yarn in its course from the lower guide block 21 to the upper guide block 22, the rods 27 and 28 flaring outwardly so as to receive a yarn and direct it to its centered position. Between the guide blocks 21 and 22 the yarn may be acted on by any suitable tension device, for instance as shown, a pair of yieldingly opposed disks or plates 30, 31 between which the yarn is adapted to enter. A hook-like member 35 may be provided below the lower guide block 21 to retain the run of yarn closely adjacent to the lower guide block 21.

The slub-catcher of the present invention is preferably located to act on the centered vertical run of yarn between the guide blocks 21 and 22.

In its simplest form, as here illustrated, the slub-catcher of this invention includes opposed elements which normally cooperate in defining a yarn passage of appropriate width to exclude the passage of an objectionable enlargement such as a slub, one of such opposed elements being arranged to slide with relation to the other as will hereinafter appear. As will hereinafter appear, the sliding arrangement permits exposure of a side of the yarn passage normally covered by one of the opposed elements. Moreover, the sliding arrangement permits a portion of one element to slide in contact with that portion of the other element that normally defines one side of the yarn passage. As will be seen, the construction of the slub-catcher illustrated herewith is adapted to prevent the two elements from becoming separated by waste or fly. Provision

is made for cleaning the slub-catcher without impairing the accuracy of the spacing of the two elements that define the yarn passage. Moreover, for convenience in setting the yarn passage to a desired width, one of the opposed elements can readily be removed and can have substituted therefor a similar element formed to provide a yarn passage of a predetermined width as desired, and this change of elements can be done quickly and without the need for tools.

In the preferred illustrated construction the slub-catcher includes two elements in the form of blocks **40** and **41** having their opposed surfaces accurately ground to fit closely one against the other excepting at their outer ends as shown in Fig. 4, so as to form slide bearing surfaces on which one block can slide with relation to the other. At the outer end of one of the blocks, for instance block **41**, its surface which faces the other block is recessed as at **42**, preferably by grinding, so that this recessed surface **42** together with the opposite surface of the block **40** forms a yarn passage. The yarn passage may be of any desired width, for instance in the region around .0010 inch to .0024 inch, to suit the yarn being handled.

Block **40** may be secured, for instance by screws, to the vertical portion of apron plate **24** as shown in Figs. 1 and 4 immediately beneath the upper guide block **22**, and block **41** may be slidably held by a plate **44** which is secured to the lower surface of block **40** and extends under block **41** as shown in Figs. 1 and 2.

Block **41** which is herein shown as the slidable block, is recessed as at **46** to receive a plunger **48** slidingly held within a crank arm **49** and urged against the block **40** by an interior spring **51**.

Crank arm **49** is secured to the upper end of a shaft **50** which is rotatable in a bracket **52** and bent at its lower portion to form a further crank arm **53**. A spring **56** connected to the upright **11** of the winding unit and to the crank arm **53** normally holds the crank arms **53** and **49** in the position shown in Fig. 3, in which position, as in Fig. 4, the recessed surface **42** of the block **41** forms a yarn passage with the block **40**, adapted to receive the running yarn.

The interior spring **51** tends continuously to project the plunger **48** from the crank **49** and against the slidable block **41** to hold the slidable block **41** firmly against the stationary block **40**.

At intervals during the winding, for instance as the winding unit passes a predetermined place on the frame of the machine, the lower crank arm **53** engages a stationary cam **57** adapted to force the crank arm **53** outwardly to the broken line position of Fig. 3, rotate the shaft **50** and cause the crank arm **49** and plunger **48** to slide the slidable block **41** forwardly to the position of Fig. 5. In this movement the surface portion of stationary block **40** that normally defines one side of the yarn passage is slid over by the accurately ground surface of slidable block **41**, with consequent removal of waste or fly. Simultaneously the side of the yarn passage normally covered by block **40** is uncovered, as in Fig. 5, and any waste or fly that has tended to accumulate in the yarn passage is free to drop out.

In the forward position of the slidable block **40**, as shown in Fig. 5, the spring **51** and plunger **48** hold the blocks **41** and **40** firmly in contact, so that waste or fly cannot separate the slide bearing surfaces of these elements. Thus when the slidable block **41** is returned to normal position, it is assured that the width of the yarn passage will be the same as before the yarn passage was opened.

Upon the winding unit passing the cam **57**, the crank arm **53** is released by cam **57** and the spring **56** restores the movable parts of the slub-catcher to their normal positions.

Ordinarily cam **57** can be of relatively short length in the direction of travel of the winding units, and can be located at a place where the winding package is being rotated by the roll **26** to wind the yarn. With this arrangement the slub-catcher is automatically slid open and cleaned while the yarn is running in contact with the recessed surface **42**, and is quickly restored to the normal position of Fig. 4. This mode of operation facilitates the cleaning of the surface **42** because the fast traveling yarn tends to dislodge waste or fly therefrom when the slub-catcher is momentarily opened. When the slub-catcher is open, it will of course allow a slub to pass, but the opening and closing can be accomplished so quickly that only a very short length of yarn can pass the slub-catcher while the slub-catcher is in its open condition.

The ability to clean the slub-catcher during running of the yarn is also advantageous in enabling this cleaning operation to take place at a number of points around the machine without waiting for the winding units to reach an end of the machine where their yarns cease winding.

Particularly if cam **57** is located at a place where the winding units are inactive, such as at an end of the machine, it may be desired to provide an air blast nozzle to cooperate with the successive open slub-catchers to clean them further, and U. S. Patent No. 1,622,607 may be referred to as showing use of an air blast to clean an open slub-catcher. However, ordinarily, such air blast will not be necessary.

By manually swinging the crank **49** and slidable block **41** a little farther forward than shown in Fig. 5, the slidable block **41** may be removed without the use of tools, the plunger **48** slightly retracting into the hollow arm **49** to permit this. Thereupon another block **41**, having its surface **42** recessed to the desired depth, can be inserted, also without the use of tools, and the spring **56** of Fig. 3 will carry the new block **41** to its normal operative position of Fig. 4. The whole set of slub-catchers of a winding machine can very readily be reset to a different width of yarn passage in this manner.

I claim:

1. A slub-catcher including opposed abutting elements shaped and positioned to cooperate normally in defining a yarn passage between them, and means acting periodically to slide one of said elements in abutting relation to the other element sufficiently to expose substantially an entire side of the yarn passage.

2. A slub-catcher including opposed elements shaped and positioned to cooperate normally in defining a yarn passage between them, said elements having mutually fitting slide bearing surfaces, and means acting periodically to slide one of said elements relatively to the other element, with said bearing surfaces in contact, sufficiently to expose substantially an entire side of the yarn passage.

3. A slub-catcher including two abutting elements having normally opposed cooperating surfaces defining a yarn passage between them and means acting periodically to shift one of said ele-

ments in abutting relation to the other element and in a path which is parallel with its passage-defining surface, sufficiently to project such passage-defining surface substantially entirely beyond the passage-defining surface of the other element.

4. A slub-catcher including two passage-defining elements having opposed mutually fitting contacting surfaces, one of said elements being recessed opposite to a passage-defining portion of the surface of the other element to cooperate with such portion in defining a yarn passage, the elements being relatively shiftable, with said surfaces in contact, sufficiently to cause the recessed part of one element to lie substantially entirely beyond said passage-defining portion of the surface of the other element.

5. A slub-catcher including two passage-defining elements having opposed mutually fitting contacting surfaces, one of said elements being recessed opposite to a passage-defining portion of the surface of the other element to cooperate with such portion in defining a yarn passage, the elements being relatively shiftable, with said surfaces in contact, sufficiently to displace a non-recessed portion of the recessed element along and in contact with said passage-defining portion of the surface of the other element.

6. A slub-catcher including opposed elements shaped and positioned to cooperate normally in defining a yarn passage between them, one of said elements being slidable with relation to the other element to expose a side of the yarn passage normally covered by the other said element, a crank, an extension projectable from the crank, spring means for urging the extension against the slidable element and means for moving the crank to slide the slidable element.

7. A slub-catcher adapted for ready change of one of its elements to provide the desired width of yarn passage, the slub-catcher including two elements having flat mutually fitting slide bearing surfaces, one element being recessed to define the yarn passage in cooperation with the other said element, means for supporting said elements so that said recessed element is removable from said other element by sliding of its slide bearing surface on the slide bearing surface of the other element, and manually displaceable means for urging said recessed element into cooperative relation to said other element.

8. A textile machine including means for winding yarn and a slub-catcher comprising opposed abutting elements shaped and positioned to cooperate in defining a passage for the yarn being wound, one of said elements being slidable in abutting relation to the other element, sufficiently to expose substantially an entire side of the yarn passage, and means for periodically cleaning the slub-catcher during winding of the yarn comprising means for sliding said slidable element to expose said side of the yarn passage while the winding yarn extends therethrough.

9. A textile machine including means for winding yarn and a slub-catcher comprising opposed abutting elements one of which is recessed to define with the other element a passage for the yarn being wound, said recessed element being slidable in abutting relation to the other element sufficiently to expose substantially an entire side of the yarn passage, and means for periodically sliding said recessed element back and forth so to expose said side of the yarn passage and cover the same, during winding of the yarn.

10. A slub catcher including two abutting members disposed side by side and having surface portions which, in the normal relative position of said members, are opposed and define a yarn passage therebetween, said members having bearing surfaces in contact with each other and being shiftable relatively to each other, with said bearing surfaces in contact, to a relative position presenting substantially the entire yarn passage defining surface portion of one of said members out of opposed relation to the yarn passage defining portion of the other member, exposing substantially said entire yarn passage defining surface portion of said one member, said bearing surfaces of said members being in contact with each other in a plane parallel to a said yarn passage defining surface portion, and mechanism urging the members into their said normal relative position.

11. A slub catcher including two abutting members disposed side by side and having surface portions which, in the normal relative position of said members, are opposed and define a yarn passage therebetween, said members having bearing surfaces in contact with each other and being shiftable relatively to each other in a straight line of motion parallel to said bearing surfaces and with said bearing surfaces in contact, to a relative position presenting substantially the entire yarn passage defining surface portion of one of said members out of opposed relation to the yarn passage defining portion of the other member, exposing substantially said entire yarn passage defining surface portion of said one member, said bearing surfaces of said members being in contact with each other in a plane parallel to a said yarn passage defining surface portion, and mechanism urging the members into their said normal relative position.

12. A slub catcher including two abutting members disposed side by side and having surface portions which, in the normal relative position of said members, are opposed and define a yarn passage therebetween, said members having bearing surfaces in contact with each other, one of said members being shiftable relatively to the other said member, with said bearing surfaces in contact, to a position presenting substantially the entire yarn passage defining surface portion of said shiftable member out of opposed relation to the yarn passage defining portion of the other member, exposing substantially said entire yarn passage defining surface portion of said shiftable member, said bearing surfaces of said members being in contact with each other in a plane parallel to a said yarn passage defining surface portion, and mechanism urging said shiftable member into its normal position relative to the other member.

13. A slub catcher including two abutting members disposed side by side and having surface portions which, in the normal relative position of said members, are opposed and define a yarn passage therebetween, said members having bearing surfaces in contact with each other and being shiftable relatively to each other, with said bearing surfaces in contact, to a relative position presenting substantially the entire yarn passage defining surface portion of one of said members out of opposed relation to the yarn passage defining portion of the other member, exposing substantially said entire yarn passage defining surface portion of said one member, said bearing surfaces of said members being in the

same plane as the yarn passage defining surface portion of one of said members, and mechanism urging the members into their said normal relative position.

14. A slub catcher including two abutting members disposed side by side and having surface portions which, in the normal relative position of said members, are opposed and define a yarn passage therebetween, said members having bearing surfaces in contact with each other, one of said members being shiftable relatively to the other said member, with said bearing surfaces in contact, to a position presenting substantially the entire yarn passage defining surface portion of said shiftable member out of opposed relation to the yarn passage defining portion of the other member, exposing substantially said entire yarn passage defining surface portion of said shiftable member, said bearing surfaces of said members being in the same plane as the yarn passage defining surface portion of the said other member, and mechanism urging said shiftable member into its normal position relative to the said other member.

EDWARD J. ABBOTT.

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