Oct. 31, 1950 J. C. BOYD 2,528,298

MEANS FOR PREVENTING SINGLING
IN SPINNING OPERATIONS
Filed May 23, 1949

Fig. 1

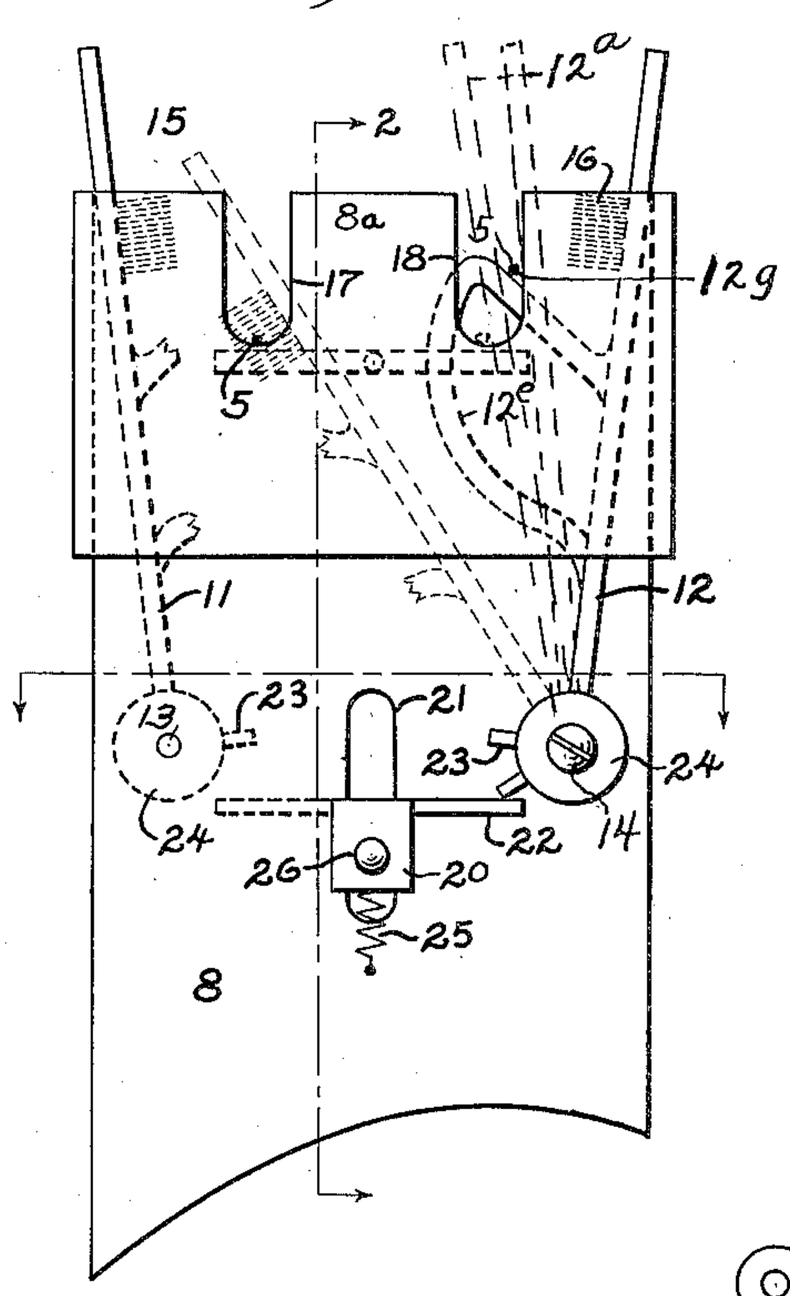


Fig. 2

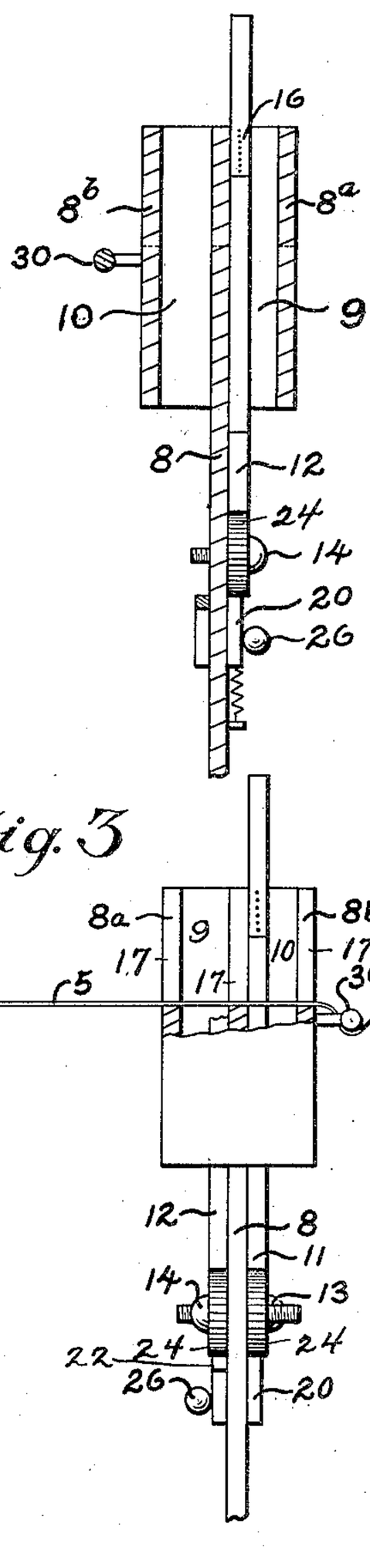


Fig. 3

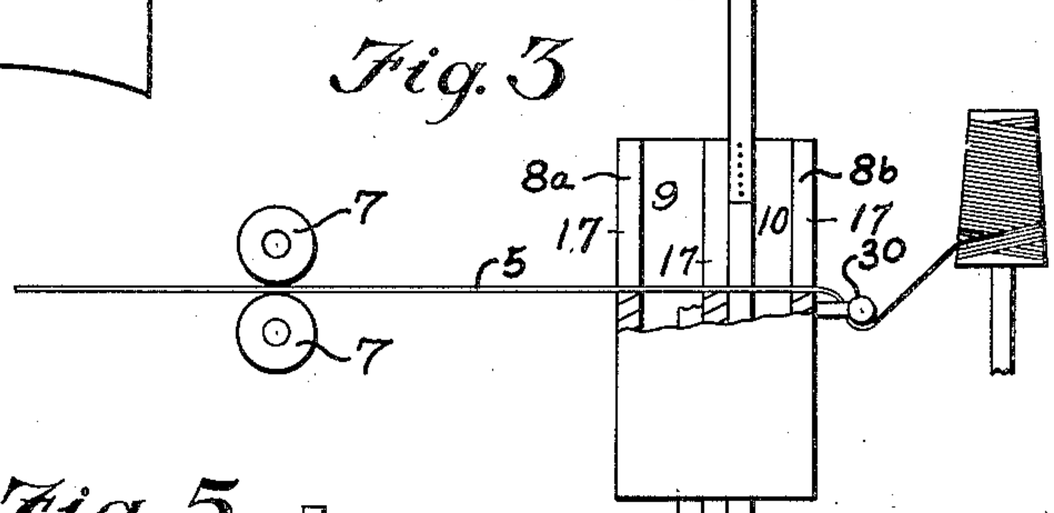


Fig. 4

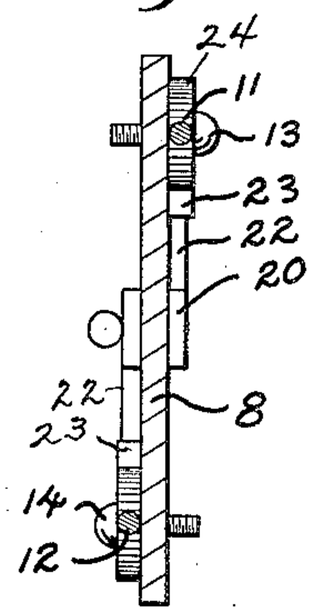
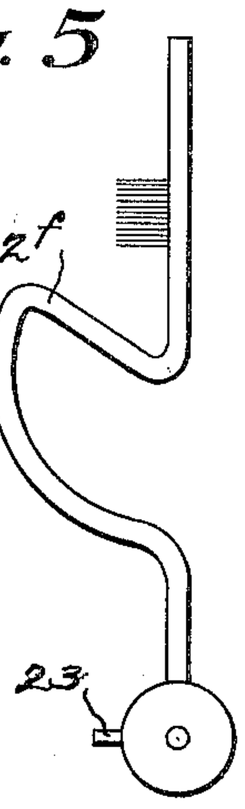


Fig. 5



INVENTOR.
JOSEPH C. BOYD
BY
Shepherd Campbell

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MEANS FOR PREVENTING SINGLING IN SPINNING OPERATIONS

Joseph Cecil Boyd, Laurens, S. C., assignor, by direct and mesne assignments, to William D. Dodenhoff, Greenville, S. C.

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6 Claims. (Cl. 57—86)

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This invention relates to an attachment for spinning frames of the type wherein two or more strands of yarn are carried along parallel paths to a point where they are brought together and twisted to form a finished thread and the object of the invention is to provide means for preventing singling in the manufacture of the thread.

This application is a continuation in part of my copending application Serial No. 89,988 filed April 27, 1949 and like that application has for its primary object to provide means for automatically severing the second strand of yarn if the first strand accidentally breaks and to do this through the medium of instrumentalities which are so sensitive in operation that they will carry out their functions without themselves imposing any such additional strain on the yarns as would tend to cause them to break.

The present application adds to the structure of my parent application means whereby the act of threading new lengths of yarn through the guides, preparatory to a resumption of operations, automatically resets to proper, yarn engaging position the severing means hereinafter described.

The principles of the invention will be understood by reference to the accompanying drawing wherein:

Fig. 1 is a front elevation of the device of the invention;

Fig. 2 is a fragmentary vertical sectional view upon line 2—2 of Fig. 1;

Fig. 3 is a side elevation of the device with the head thereof partly broken away;

Fig. 4 is a plan view illustrating the structure of the invention associated with the adjacent rollers by which the threads are engaged and fed; and

Fig. 5 is a detail view of a modified form of trip rod hereinafter described.

Like numerals designate corresponding parts throughout the several figures of the drawing.

In the drawing, 5 designates the two strands of yarn which are to be twisted together. Disposed in the path of movement of these strands of yarn is the device of my invention which comprises a base plate 8 which together with walls 8*a* and 8*b* comprises a pair of elongated loops 9 and 10. Relatively slender elongated trip rods 11 and 12 are pivotally mounted at 13 and 14 upon the opposite faces of the plate 8. These rods carry inwardly facing sharp, fine, teeth 15 and 16. Guide channels 17 and 18 for the strands of yarn are formed complementally in the three plates, 8, 8*a* and 8*b*. The yarn is drawn through these guide channels by rollers 7. This is best illustrated in Figs. 1 and 4. The pivotal mounting of the lower ends of the rods 11 and 12 adapt these rods to swing across the elongated loops 9 and 10 from the full line position illustrated in

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Fig. 1 to the dotted line positions there indicated, these dotted line positions illustrating the movements of the rod 12, it being understood that the movement of the rod 11 corresponds thereto but in the opposite direction.

When the rod 12 is in the dotted line position illustrated at 12*a* in Fig. 1, said rod rests against the strand of yarn 5 and is held against further movement toward the left. However, if that strand should break, then the rod will fall by gravity toward the left until the fine sharp comb-like teeth engage the other strand 5 and cause its breakage. The sensitivity of the device and the small amount of strain which is imposed upon the yarn flows primarily from the fact that the point of pivoting 13 and 14 of the rods is such that when said rods are in the full line position in Fig. 1 they lie outwardly of a vertical line drawn through the point of pivoting but when they are in the position illustrated at 12*a* they lie inwardly of a vertical line drawn through the point of pivoting and thus tend to fall by gravity in a direction to cause them to swing through the loops 9 and 10 and across the line of travel of the strands of yarn. The yarn does not have to support the weight of the rods but merely has to keep these rods from tipping until a strand breaks. However, the length of the rods and the distance between the guideways is such that when a strand breaks, the rods fall far enough for the teeth to acquire considerable momentum, with the result that the teeth are plunged firmly into the unbroken strand of yarn and in a manner to hold and sever the same. Thus while the engagement of the rods with the strands of yarn is very light and delicate until the time of action arrives, yet when such time arrives the action is very positive and effective.

The trip rods or wires of this application differ from the like elements of the parent application aforesaid in that they carry lateral extensions or knees 12*e* of such shape that they lie across the guide channels 17 and 18 so that as long as the trip rods are tipped outwardly of the vertical the yarn will rest upon these extensions. When the yarn is put under tension, as the rollers 7 start to draw the yarn through the guide channels, the pressure of the yarn upon the extensions 12*e*, tips the rods inwardly slightly beyond the vertical and the yarn then rides past the inner side faces of the rods, and the knees move downwardly far enough to be completely out of engagement with the yarn, or in other words wholly below the faces of the guide channels. Thus the yarn does not have to bear the weight of the trip rods. The extensions 12*e* may be separate pieces secured to mere straight rods, as in Fig. 1 or they may be formed in the bending of the rod as at 12*f* in Fig. 5. Or these parts may be stampings of metal, plastic or any other suitable material.

Another respect in which the present application differs from my parent application aforesaid is in the manner in which the housing comprised by base plate **8** and walls **8***a* and **8***b* are carried upwardly far enough to house the fine, sharp teeth **15** and **16** of the trip rods. This guards against the possibility that the operator will be injured by these teeth.

I am aware of the fact that it has heretofore been proposed to provide pivoted toothed members riding upon strands of yarn and acting when one of said strands breaks to permit a toothed member to engage the other strand for the purpose of breaking the same and thus to prevent singling. However, all of the devices with which I am familiar are so constructed that the yarn strands which are, themselves, none too strong have had to support the weight of the toothed elements in a way wholly different from that which is proposed under the present construction. Not only are the elements which go to make up the device of the present invention extremely simple and inexpensive but they act more effectively and with less strain upon the yarn than with any known device with which I am familiar.

While it is an easy matter to move the rods **11** and **12** to the full line positions illustrated in Fig. 1 by merely grasping the upper ends of the rods, I may, if desired, provide means for simultaneously moving these rods to the full line positions illustrated. One way of accomplishing this has been illustrated, consisting of a slide **20** mounted to move in a slot **21**. This slide has extensions **22** adapted to underlie and engage projecting pins **23** upon the hubs **24** of the rods **11** and **12**. A spring **25** may be employed to draw the slide downwardly. When the slide is thrust upwardly by grasping its knob **26** its extensions engage the pins and swing the rods outwardly. To further insure the movement of the toothed rods to past center yarn engaging position, I may provide a guide rod **30** beneath which the yarn or roving is threaded so that the roving does not enter in a straight horizontal direction but is carried upwardly over the knees **12***a* on its way to feed rollers **7**. Thus as these rollers impose drawing action upon the roving said roving exerts a downward thrust on the knees.

I wish it to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claims.

Having described my invention what I claim is:

1. A device for preventing singling comprising a support, a pair of elongated upstanding members, pivoted at their lower ends to said support, yarn engaging and breaking teeth projecting inwardly from said members adjacent the upper portions thereof, and a pair of yarn guideways lying between said members, the point of pivoting of said members being such that the upstanding members engage the sides of runs of yarn traveling through said guideways with said upstanding members tipped slightly past center toward said guides and means upon said members and engageable by the yarn for automatically moving said members to past center position and against the yarn under the influence of tension upon the yarn.

2. A device for preventing singling comprising a support, a pair of elongated upstanding members, pivoted at their lower ends to said support, yarn engaging and breaking teeth projecting inwardly from said members adjacent the upper portions thereof, and a pair of yarn guideways lying between said members, the point of pivoting of said members being such that the upstanding members engage the sides of runs of yarn traveling through said guideways with said upstanding members tipped slightly past center toward said guides, and extension portions upon said members which extend across the yarn guideways above the level of the bottom of the guideways, as long as the members are tipped beyond the vertical away from the yarn, the pressure of the yarn when placed under tension acting upon said extensions to move the members to past center position and toward the yarn.

3. A device for preventing singling comprising a support, a pair of elongated upstanding members, pivoted at their lower ends to said support, yarn engaging and breaking teeth projecting inwardly from said members adjacent the upper portions thereof, and a pair of yarn guideways lying between said members, the point of pivoting of said members being such that the upstanding members engage the sides of runs of yarn traveling through said guideways with said upstanding members tipped slightly past center toward said guides, and portions upon said members which extend across the yarn guideways above the level of the bottom of the guideways, as long as the members are tipped beyond the vertical away from the yarn, the pressure of the yarn when placed under tension acting upon said extensions to move the members to past center position and toward the yarn and means carried by the support for housing said teeth when they are tipped outwardly beyond the vertical.

4. A device of the character described the combination with a support carrying a pair of spaced guideways of means for drawing strands of yarn to be twisted through said guideways, a pair of toother trip rods pivoted in such relation to the guides that when said rods stand nearly upright with the strands of yarn riding past their sides they are tipped to less than 10° from the vertical, groups of sharp, fine, yarn piercing teeth projecting from the confronting faces of said rods, and extensions projecting from said rods across the guideways of such shape that said extensions lie above the working face of the guideways as long as the rods are tipped away from the guideways beyond the vertical, said extensions moving below the level of the working faces of the guideway to permit the latter to receive the yarn when the rods are tipped beyond the vertical toward the opposing guideway.

5. A structure as recited in claim 1 in combination with means for drawing said yarn through said guides and an additional guiding means so positioned with respect to the drawing means that the yarn is caused to pass over the means upon the members with a change of direction which increases the thrust of the yarn upon said means as the drawing means exerts pull upon the yarn.

6. A structure as recited in claim 5 in combination with a pair of feed rollers mounted at one side of the support and acting to draw the runs of yarn through the yarn guideways and a guide bar located at that side of the support remote from the rollers, with which the yarn engages, said bar being located below the level of the yarn guideways.

JOSEPH CECIL BOYD.

No references cited.