March 27, 1928. 1,663,857

B. A. PETERSON

YARN CLEARER OR THE LIKE

Original Filed Dec. 31, 1923

Fig. 1.

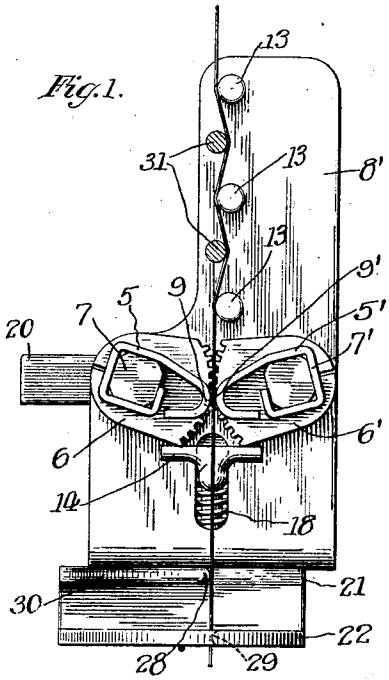


Fig. 3.

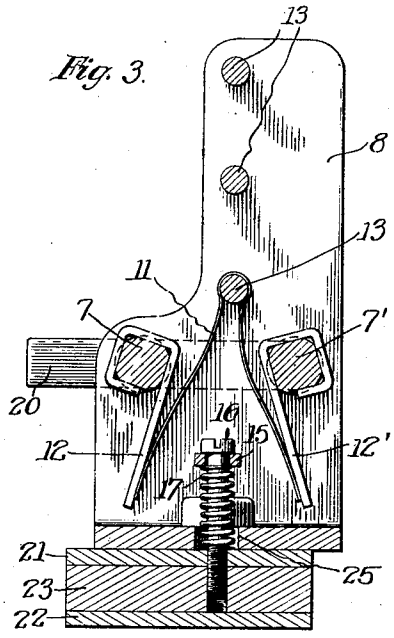


Fig. 2.

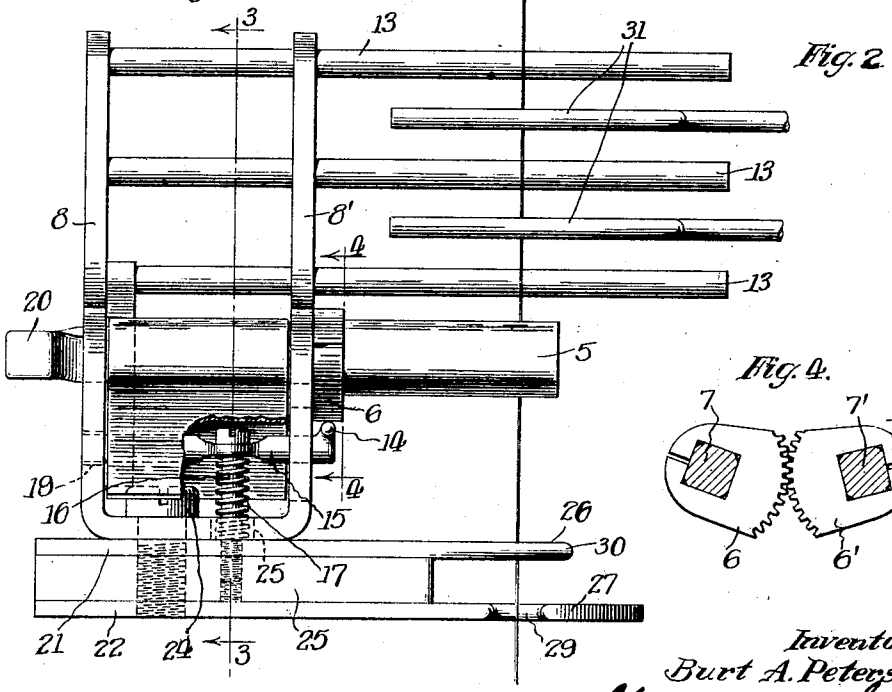


Fig. 4.

Inventor:-
Burt A. Peterson
By Whitehead, Parker & Carlson
Attys.

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UNITED STATES PATENT OFFICE.

BURT A. PETERSON, OF ROCKFORD, ILLINOIS, ASSIGNOR TO BARBER-COLMAN COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

YARN CLEARER OR THE LIKE.

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The present invention relates to the provision of a clearing means simple in construction and effectual in operation, which is adjustable to accommodate yarns of varying sizes, which is capable of being cleaned readily, and which is operable to effect a breakage of the yarn or thread as a preferred alternative to the passage of a wad or objectionable enlargement on the thread.

In carrying out my invention I preferably employ two members operatively connected together as by means of a pair of gear elements so as to be movable simultaneously toward and away from each other, in combination with spring means tending to separate the members in one direction and an adjustable stop for limiting such movement of separation by the spring means. Suitable thread guiding means is also provided for positioning the thread between the two members, and the arrangement is such that in the event an irremovable obstruction encounters the clearing members, the latter are moved with the thread so as to engage and clamp it, resulting in the breakage thereof. The invention also contemplates means for automatically or manually operating the clearing members for cleaning purposes.

In the accompanying drawings wherein I have illustrated a preferred embodiment of my invention,

Figure 1 is an end elevational view of the clearing means with a pair of detector fingers, forming no part of the invention, shown in section.

Fig. 2 is a front elevational view of the device, a portion being broken away to show details of construction.

Fig. 3 is a vertical sectional view taken on the plane of line 3—3 of Fig. 2.

Fig. 4 is a detail view showing the gear elements operatively connecting the clearing members together.

Referring to Fig. 1, 5 and 5′ designate the two swingably mounted clearing members having their inner ends normally spaced a short distance apart to permit of the free passage therebetween of the body of the thread to be cleared, while removing therefrom loosely adhering particles. These members are inclined slightly from their inner ends upwardly or in the direction of travel of the thread to be cleared, and preferably the members are operatively connected together by a pair of gear elements 6 and 6′ for movement toward and away from each other. This manner of mounting the members 5 and 5′ serves two purposes. Thus it provides for the relative adjustment of the members to vary the distance between the two members in accordance with the size of the yarn being wound, and it effects a clamping and consequent breakage of the thread when an irremovable obstruction or enlargement thereon causes the clearing members 5 and 5′ to move with the thread and consequently into clamping engagement therewith.

Said clearing members 5 and 5′ and their connecting gear elements are mounted upon the ends of a pair of horizontally spaced parallel rock shafts 7 and 7′ which in turn are journaled in a pair of spaced upright standards 8 and 8′ connected at their lower ends by an integral portion so as to form a U-shaped frame. Preferably the ends of the shafts projecting from the standard 8′ are squared to hold the members 5 and 5′ and gear elements 6 and 6′ thereon against rotation.

In the present instance the members 5 and 5′ are formed from sheet metal bent at one end around the squared shafts, and at their opposite end are shaped to provide parallel rounded yarn clearing surfaces 9 and 9′. These surfaces, as shown in Fig. 1, are normally spaced far enough apart to be out of contact with the running thread; but in the event that the members should not be properly positioned, wear on the thread would be practically negligible because of the smoothness of the surfaces. Moreover, the device may be more readily cleaned because of the absence of sharp or rough edges to which the particles removed might have a tendency to adhere. The gear elements 6 and 6′ may be provided with split bearings as shown at 10 (Fig. 4) whereby they may be quickly and easily secured to the squared ends of the shafts 7 and 7′.

Between the standards 8 and 8′ I provide spring means tending to rock the shafts in opposite directions so as to move the opposed surfaces 9 and 9′ away from each other. This spring means comprises, in the present instance, a double leaf spring 11 the opposite ends of which engage with a pair of arms 12 and 12′ on the shafts 7 and 7′, respectively, as shown clearly in Fig. 3. These arms 12 and 12′ extend downwardly from the shafts

7 and 7′, being secured to the latter by having their upper ends bent around squared portions thereof; and the leaf spring is suitably supported upon one of three rods 13 mounted in the upper portions of the standards 8 and 8′ one above the other and extended beyond the standard 8′ to provide means for guiding the thread in a manner which will presently appear.

In opposition to the spring means 11 I provide a stop 14 (Fig. 1) with which the gear elements 6 and 6′ are adapted to engage. This stop is in the form of a bar, of a length adapted to bridge the gear elements, and thus hold both members 5 and 5′ definitely in their proper position. The stop or bar 14 is carried by a rod 15 which is mounted in the standards 8 and 8′ of the frame. Between its ends said rod 15 is apertured to receive the upper end of a screw 16 about which is encircled a coiled expansion spring 17 tending to hold the rod 15 upwardly against the head of the screw. To accommodate the up and down movements of the stop bar 14, the upright 8′ of the frame has an elongated slot 18 through which the rod passes, the opposite upright 8 having an opening 19 sufficiently large to permit the rod 15 to tilt. The spring 17 is made of such strength that normally it supports the stop bar 14 in contact with the head of the screw 16 against the action of the spring 11 and thus determines the distance between the opposed surfaces 9 and 9′. The construction provided, however, permits of the forcible movement of the members 5 and 5′ to separate the surfaces 9 and 9′ for purposes of cleaning. Such movement may, in the present instance, be effected by means of a crank arm 20 rigid with one of the rock shafts (herein the shaft 7′) and extending forwardly beyond the supporting frame. This crank arm may be operated manually, or when the device is used upon an automatic winder such, for example, as that illustrated in the Colman Patent No. 1,267,977 issued May 28, 1918, this arm may be engaged by a cam bar on the winder-tender mechanism adapted to swing the members 5 and 5′ so as to separate the surfaces 9 and 9′, thus permitting accumulations of yarn clearings to drop out.

Preferably the supporting frame is mounted upon a horizontal base consisting of a pair of plates 21 and 22 separated by a block 23, the frame being secured upon this base by means of a screw 24. The screw 16 of the adjusting means is also mounted in this base, passing through an aperture 25 in the base of the frame sufficiently large to provide a recess to receive the lower end of the spring 17, as shown in Fig. 3.

As a means for guiding the thread into position between the members 5 and 5′ I extend the plates 21 and 22 outwardly beyond the block 23, as shown clearly in Fig. 2, to form upper and lower guide members 26 and 27 providing opposed guiding surfaces 28 and 29, respectively (Fig. 1), the surface 29 (Fig. 2) forming the end wall of a forwardly opening slot adapted to receive the thread. The upper member 26 provides a rounded guiding surface 30 which is adapted to coact with the open-ended slot in the lower member in positioning the thread between the two guide surfaces 28 and 29.

Above the clearing members 5 and 5′ the thread passes over the extended ends of the rods 13. The latter, it will be observed, constitute a grid against which the thread is pressed by means of detector fingers 31 suitably mounted on the winder or spooler.

It will be observed that I have provided a clearing means for thread or yarn which is capable of easy adjustment to accommodate yarns of varying sizes, and which is operable not only to clean the yarn in its passage to the yarn mass being formed, but also to insure that imperfections incapable of being dislodged by the clearing members shall not pass, by effecting a breakage of the yarn. The yarn-clearing and clamping members extend toward the side from which the yarn approaches and are inclined downwardly at an angle sufficiently great so that an enlargement or piece of foreign matter too large to pass through the space between said members will cause the members to swing toward each other and thus clamp the thread.

In the appended claims the terms "yarn" and "thread" are intended to include any analogous material.

It will be apparent that various features of the construction herein shown are adapted for use in other devices than yarn clearers, as, for example, yarn-tensioning devices.

I claim as my invention:

1. A yarn clearer or the like comprising, in combination, a frame, a pair of rock shafts mounted in the frame in spaced parallel relation, a pair of yarn clearing members mounted on said shafts, means operatively connecting said shafts together for operation in unison, means tending to turn said shafts in one direction to move said members apart, and adjustable means for limiting the movement of said members by the last mentioned means.

2. The combination of a pair of shafts mounted to turn on spaced parallel axes and operatively connected together, spring means tending to turn said shafts in opposite directions, a pair of members mounted on said shafts to turn therewith and providing a pair of opposed thread-clearing surfaces, and means for limiting the movemnts of said members by said spring means to determine the distance between said surfaces.

3. The combination of a pair of shafts mounted to turn on spaced parallel axes and operatively connected together, spring means tending to turn said shafts in opposite directions, a pair of members mounted on said shafts to turn therewith and providing a pair of opposed thread-clearing surfaces, means for limiting the movements of said members to determine the distance between said surfaces comprising a stop bar, and means for yieldably supporting said bar in adjusted position.

4. A yarn-clearing means comprising, in combination, a pair of shafts mounted in spaced parallel relation, a pair of members mounted on said shafts and providing a pair of opposed thread-clearing surfaces, a stop bar, means on said shafts coacting with said bar to hold said surfaces a predetermined distance apart, and means for varying the position of said bar.

5. A yarn-clearing means comprising a pair of members mounted to turn on spaced parallel axes, means operatively connecting said members for movement in unison, and means including a stop member adapted to hold said members in a predetermined thread-clearing position.

6. A yarn-clearing means having, in combination, a pair of clearing members mounted for relative turning movement and providing a pair of opposed thread-clearing surfaces, spring means tending to effect such relative turning movement between the members, and adjustable stop means for limiting such swinging movement but adapted to yield under force to permit the separation of said surfaces.

7. A yarn-clearing means having, in combination, a pair of yarn-clearing members mounted for relative swinging movement and providing a pair of opposed thread-clearing surfaces, spring means tending to effect such relative swinging movement between the members, adjustable stop means for limiting such swinging movement including a rod having means for yieldably supporting it in a predetermined position, and means for effecting relative swinging motion between the members against the action of said yieldable stop.

8. A yarn-clearing means comprising, in combination, a pair of yarn-clearing members mounted for relative swinging motion, means for supporting one of said members including a rock shaft, a yieldable stop normally tending to limit such relative swinging motion between said members, and means for rocking said shaft against the action of said yieldable stop.

9. A yarn-clearing means having a pair of members providing opposed smooth rounded yarn-clearing surfaces, means operatively connecting said members for relative swinging movement in unison, and means for determining the distance between said opposed surfaces, the arrangement being such that upon the engagement of an obstruction upon the yarn which is incapable of being dislodged, the movement of said members toward each other to clamp the yarn between said members is effected.

10. A yarn-clearing means comprising a pair of members mounted on spaced parallel axes, means operatively connecting said members for movement in unison, said members providing opposed thread clearing surfaces, and the arrangement being such that the engagement of an obstruction upon the thread with the members will move the members into clamping engagement with the thread in the event the said obstruction can not be dislodged by said members.

11. The combination of two parallel rock shafts, intermeshing gear elements fixed on said shafts, two members each fixed to one of said shafts and projecting toward each other, said members having smooth yarn-engaging surfaces between which the yarn may travel, spring means acting upon both shafts in the direction to move said members apart, an adjustable yieldable stop engaging both gear elements and thus limiting the action of said spring means and determining the normal position of said members, and a crank arm on one of said shafts for turning the latter.

12. The combination of two parallel rock shafts intermeshing gear elements fixed on said shafts, two members each fixed to one of said shafts and projecting toward each other, said members having yarn-engaging surfaces between which the yarn may travel, spring means acting upon said shafts in the direction to move said members apart, an adjustable yieldable stop engaging one of said gear elements and thus limiting the action of said spring means, and a crank arm on one of said shafts for turning the latter.

13. The combination of two parallel rock shafts, intermeshing gear elements fixed on said shafts, two members each fixed to one of said shafts and projecting toward each other, said members having yarn-engaging surfaces between which the yarn may travel, spring means acting upon said shafts in the direction to move said members apart, adjustable yieldable means to limit the action of said spring means, and a crank arm on one of said shafts for turning the latter.

14. A yarn clearer comprising a member bent up from flat metal stock to form at one end a smooth clearing surface rounded at it upper and lower extremities, the opposite end of the member being adapted to be secured to a supporting shaft or the like.

In testimony whereof, I have hereunto affixed my signature.

BURT A. PETERSON.