April 28, 1936. C. A. RUDISILL 2,038,856

YARN OR THREAD GASSING MACHINE

Filed Dec. 29, 1934 3 Sheets-Sheet 1

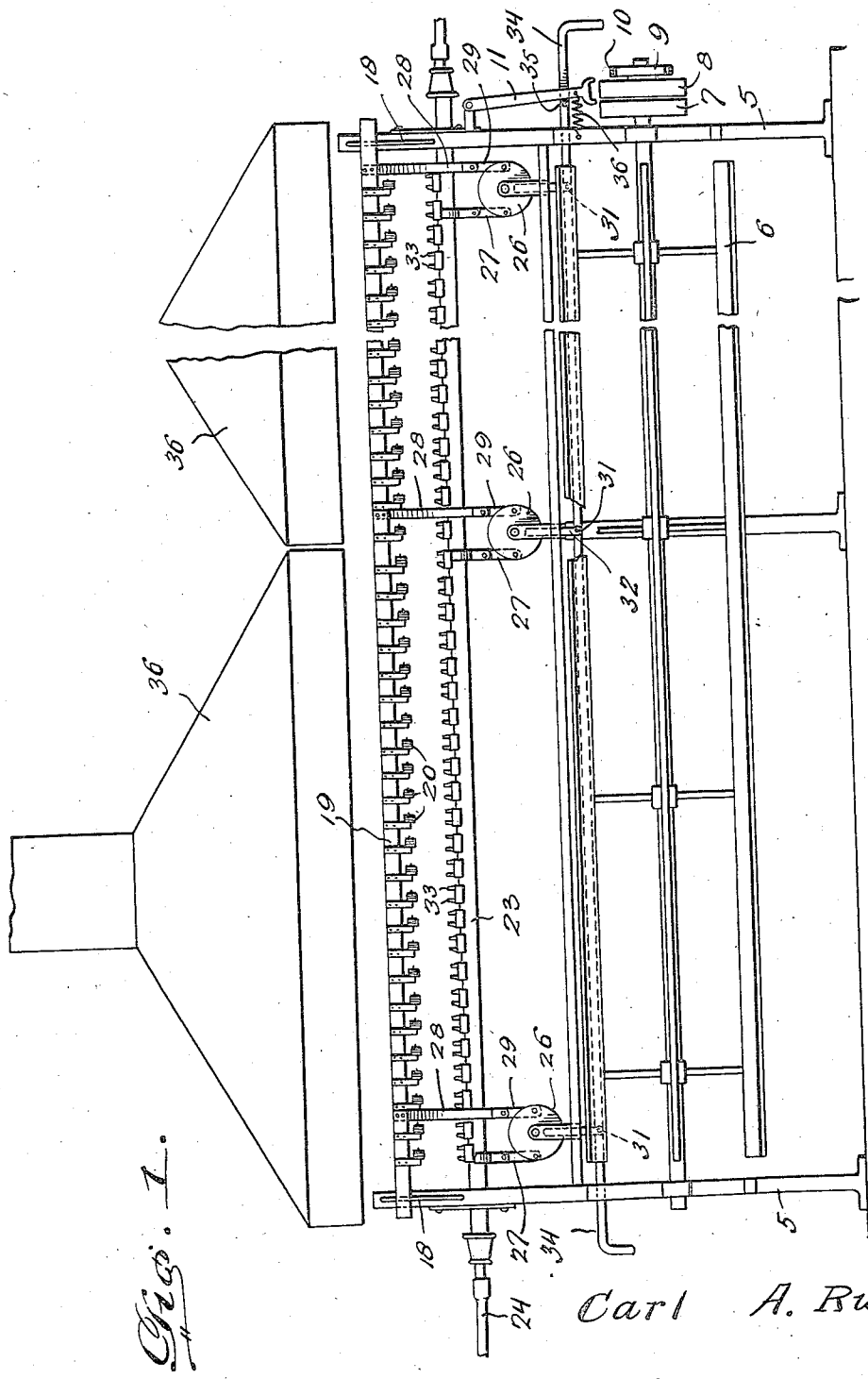

Fig. 1.

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Fig. 3.

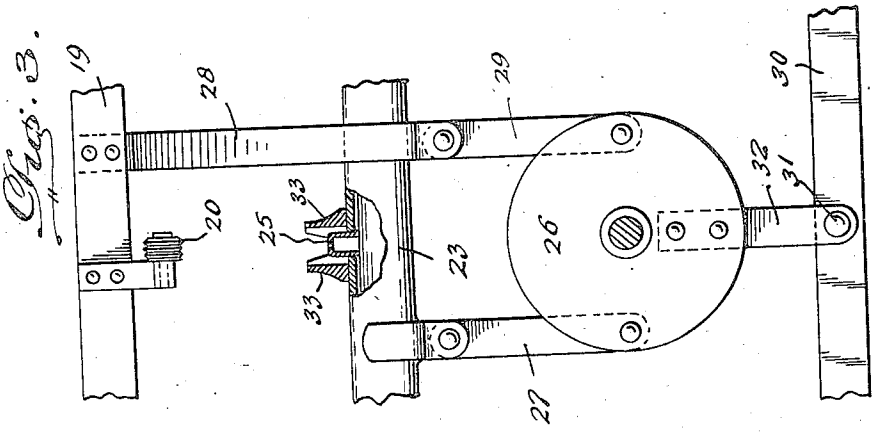
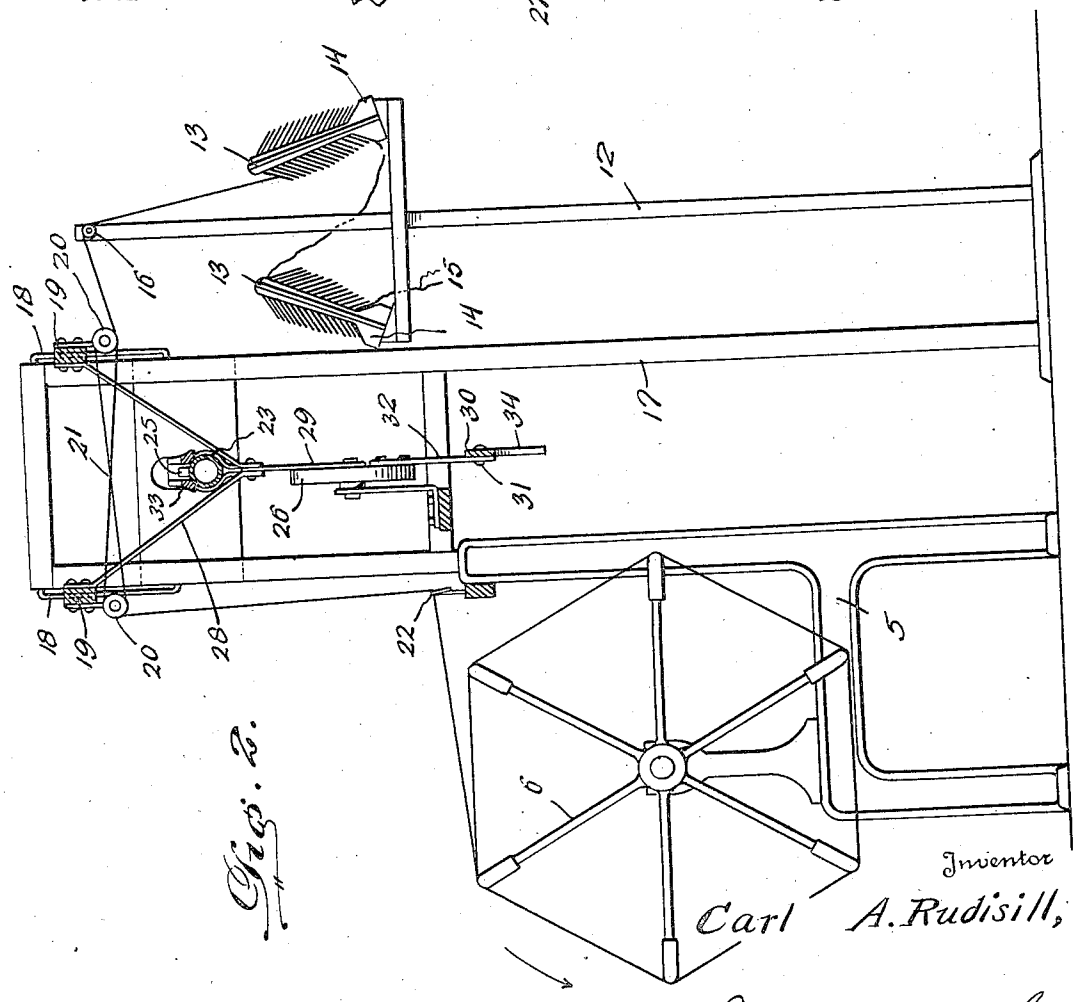


Fig. 2.



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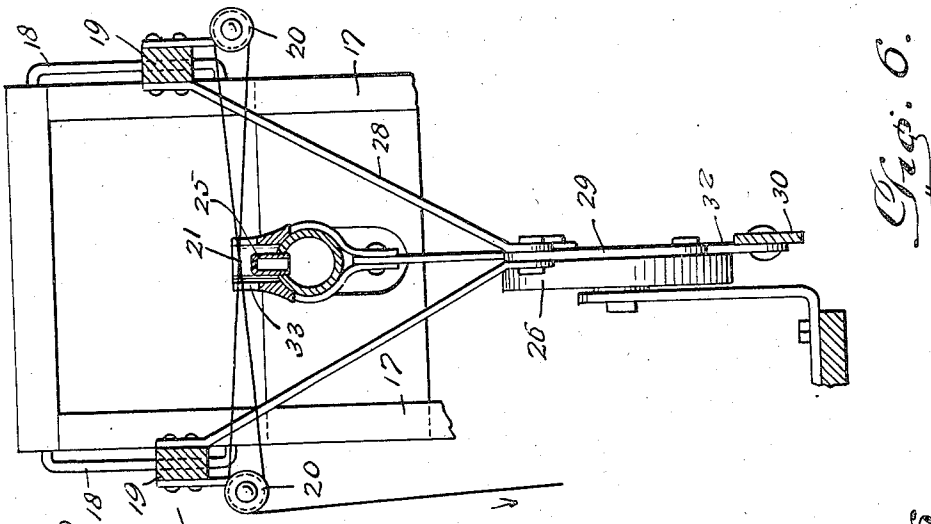

Fig. 6.

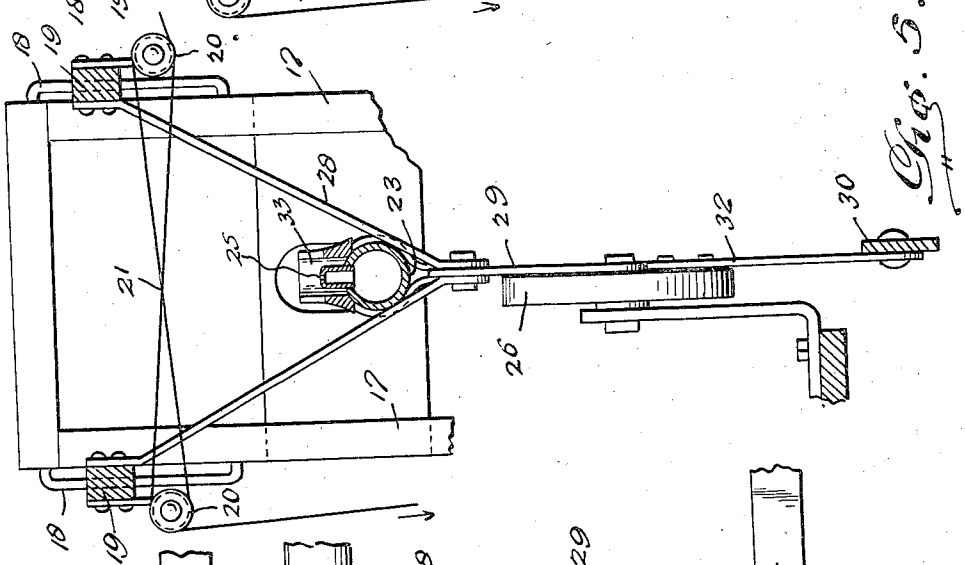

Fig. 5.

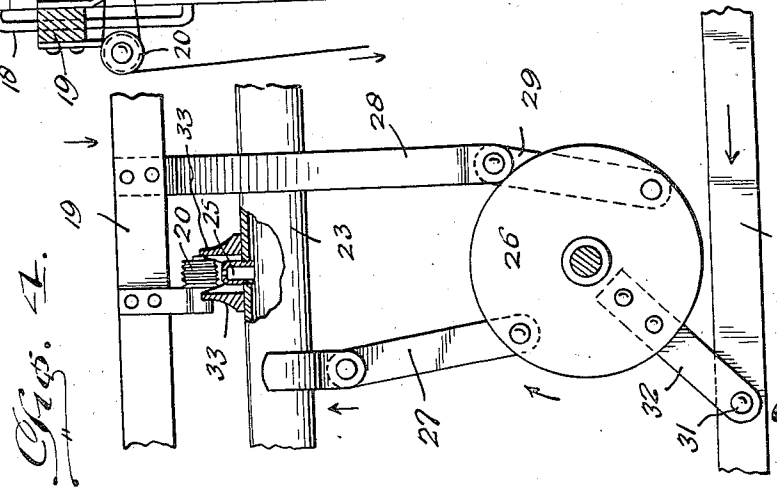

Fig. 4.

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UNITED STATES PATENT OFFICE

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YARN OR THREAD GASSING MACHINE

Carl A. Rudisill, Cherryville, N. C.

Application December 29, 1934, Serial No. 759,788

5 Claims. (Cl. 28—63)

This invention relates to apparatus for gassing or singeing yarn or thread by means of a burner for the purpose of removing fine fibers or fluff standing off or projecting from the surface of the yarn or thread.

More particularly, the present invention relates to a yarn or thread gassing apparatus so constructed as to form part of a machine for winding the thread or yarn from bobbins to a reel, the yarn or thread being wound into skeins on the reel.

An important object of the present invention is to provide an improved gassing apparatus of the above kind wherein means is provided to bring the yarn or thread in proximity to the burner or flame when the machine is placed into operation for winding the yarn or thread onto the reel, and to move the yarn or thread away from the burner or flame whenever the reeling operation is stopped.

Still another object of the present invention is to provide a gassing apparatus of the above kind wherein the yarn or thread is fed through the machine so as to pass a plurality of times through the singeing zone or flame of the burner in travelling from the bobbins to the reel, whereby the thread or yarn will be uniformly and completely gassed to insure a uniform and superior yarn or thread when finally wound onto the reel.

Still another object of the present invention is to provide means whereby the reel will be placed into operation slightly in advance of movement of the thread and burner into singeing or gassing relation, and for moving the thread and burner away from each other and out of singeing relation immediately in advance of stopping the reel, whereby any likelihood of burning through the yarn or thread by reason of maintenance of the thread and burner in gassing relation when the yarn or thread is stationary, is prevented.

Other objects and features of the present invention will become apparent from the following description when considered in connection with the accompanying drawings, in which:

Figure 1 is a somewhat diagrammatic elevational view, partly broken away, of a machine constructed in accordance with the present invention.

Figure 2 is a view thereof, partly in end elevation and partly in vertical section.

Figure 3 is an enlarged fragmentary detail view, partly in elevation and partly in section, and illustrating details of the burner and the means for relatively shifting the burner and the thread or yarn guiding rollers.

Figure 4 is a view similar to Figure 3 with the yarn drying roller and burner shifted toward each other in their operative relation.

Figure 5 is an enlarged fragmentary section more clearly showing the burner and adjacent parts as illustrated in Figure 2; and

Figure 6 is a view similar to Figure 5 with the burner and the yarn or thread guiding rollers shifted toward each other with the yarn in singeing relation to the burner.

Referring in detail to the drawings, **5** indicates the supporting frame of a winding reel **6** whose shaft is provided at one end with fast and loose pulleys **7** and **8**, and a brake drum **9** with which is associated the usual brake band **10**. As is usual with reel mills of this type, the reel **6** is rotated by a motor driven belt, and a belt shifter **11** is arranged to move this driving belt from fast pulley **7** to loose pulley **8**, or vice versa, for respectively throwing the reel **6** out of or into operation. Also, in mills of this kind, means is usually provided for automatically applying the brake band **10** to the brake drum **9** and promptly stopping rotation of reel **6** when the latter is thrown out of operation by shifting of the driving belt from pulley **7** to pulley **8**, and for releasing the brake band **10** when the reel **6** is placed into operation by shifting of the driving belt from loose pulley **8** to fast pulley **7**. As this particular means or mechanism forms no specific part of the present invention, it is not illustrated.

Arranged rearwardly of the reel **6** is a creel **12** of any preferred or ordinary construction having spindles **13** for supporting the desired number of bobbins **14** so that the latter will be arranged in pairs with those of each pair arranged one directly rearwardly of the other as illustrated in Figure 2. The thread is wound on the bobbins **14** so as to have one end exposed at the bottom of each bobbin as indicated at **15**, thereby permitting the thread at the upper end of one bobbin of each pair to be tied to the thread at the bottom of the other bobbin of said pair. Thus, as the yarn or thread is reeled from one bobbin it may be tied or connected to the thread of another bobbin without the necessity of stopping the reeling operation, a new bobbin of thread or yarn being placed in position to replace an empty bobbin whenever desired before the thread from the other bobbin of the same pair is exhausted. At the top of the creel stand **12**, a suitable guide **16** is provided over which the thread or yarn may be passed from the bobbins of each pair.

Arranged between the bobbin support or creel

and the winding reel 6 is a suitable supporting frame generally indicated at 17, and slidably mounted in brackets 18 at the top of this frame and at both the front and rear of the latter are horizontal bars 19 which carry a number of yarn or thread guiding rollers 20 each having a plurality of peripheral grooves as clearly illustrated in Figures 3 and 4. Pulleys 20 are provided on each bar 19 for the thread or yarn from each pair of bobbins, and by providing each roller 20 with a plurality of peripheral grooves, the thread or yarn may be passed about them several times and back and forth between them several times so that the thread is crossed with the strands in close proximity at a point between the associated guide rollers 20 as indicated at 21. Further yarn guides 22 are provided rearwardly of and at the top of reel 6 directly beneath the front bar 19, whereby the yarn or thread from the several bobbins may be brought downward from the guide rollers 20 of said front bar 19 and passed through the guides 22 for being properly extended to the reel 6 for being wound onto the latter into skeins. Obviously, the bars 19 are mounted for limited vertical movement, and when so moved will correspondingly shift the guide rollers 20 and the portions of the yarn extending between the latter.

Extending longitudinally of the frame 7 intermediate the front and rear of the latter and below the bars 19 is a horizontal elongated gas burner 23 connected with the gas supply line by a flexible hose 24 so as to permit vertical movement of said gas burner. This gas burner 23 is provided with a plurality of jets 25 arranged so that one is provided directly beneath the yarn from each pair of bobbins. Thus, when the bars 19 are lowered and the burner 23 is simultaneously raised, the yarn from each pair of bobbins will be brought into proximity to a jet 25 of burner 23 for being singed by the flame from such jet. On the other hand, when the bars 19 are raised and the burner 23 is simultaneously lowered, the burner and yarn are moved away from each other so that said yarn is removed from the singeing zone of the burner jets. For the latter purpose, means is provided to shift the bars 19 and burner 23 simultaneously in opposite directions to either bring the yarn running between rollers 20 and burner 23 toward each other or away from each other. This means may consist in a plurality of crank disks 26 suitably journaled in the frame 17 beneath burner 23 and operatively connected at corresponding sides by links 27 with burner 23 and at the opposite corresponding sides with bars 19 by means of rods 28 and links 29. The crank disks 26 are simultaneously actuated by means of a horizontal transversely slidable operating bar 30 suitably mounted in the frame 17 beneath the crank disks 26 and pivotally connected as at 31 to the lower ends of operating arms 32 rigid with and depending from said crank disks 26. It will thus be seen that when bar 30 is shifted in one direction, the crank disks 26 will be turned to shift the burner 23 and bars 19 toward each other from the position of Figure 3 to the position of Figure 4, and by sliding bar 30 in the opposite direction the burner 23 and bars 19 may be separated or shifted away from each other from the position of Figure 4 back to the position of Figure 3. It will be particularly noted that movement of both bars 19 and burner 23 is desirable to obtain a quicker action and eliminate the necessity of great movement such as would be required if only one of the two shiftable elements were moved. In other words if either the bars 19 or the burner 23 were stationary and the other was movable toward and away from the same, a greater movement of the movable element would be required and a slower speed of operation would necessarily result. Provided on opposite sides of each burner jet 25 are upstanding guide lugs 33 between which the several strands of the yarn passing between the associated guide rollers 20 are adapted to pass for being maintained properly grouped so as to be effectively singed or gassed.

The operating bar 30 has end handles 34 which project at opposite ends of frame 17 to permit actuation of said bar 30 from either side of the machine. One of the handles 34 is preferably provided with a pin 35 disposed at the inner side of belt shifter 11 so that when bar 30 is shifted to separate the burner 23 and bars 19, the belt shifter 11 will be moved to transfer the driving belt from fast pulley 7 to loose pulley 8. In addition, a spring 36 may be provided to swing belt shifter 11 in the opposite direction so as to transfer the belt from loose pulley 8 to fast pulley 7 when the burner 23 and bars 19 are shifted toward each other. However, this arrangement is such that the belt is shifted to fast pulley 7 to cause rotation of reel 6 slightly in advance of movement of burner 23 and bars 19 in proximity to each other, whereby the yarn is not brought into singeing relation to the flames of burner 23 until after the reel 6 has started to rotate. This prevents singeing action upon the yarn when the latter is stationary, and the same result is had by arranging pin 35 so that the yarn is moved out of singeing relation to the burner jet before the rotation of reel 6 is stopped by transfer of the driving belt from fast pulley 7 to loose pulley 8. Hoods are illustrated at 36 in Figure 1 for carrying off the fumes and products of combustion from the burner 23 and the yarn where it is singed, such hoods being disposed directly above the frame 17 and having the usual conduits for conducting the fumes and products of combustion to a ventilating stack or chimney.

It is of course realized that the principal objects of the present invention may be carried out in many ways and by many forms of construction. Consequently, the invention is not limited to the particular details or embodiments herein illustrated merely by way of example.

In operation, rod 30 is shifted to the left so as to cause rotation of reel 6 and then immediately bring the yarn in proximity to the jets of burner 23 at points intermediate the guide rollers 20. As the yarn or thread is wound into skeins onto the reel 6 from the bobbins 14, it is continuously singed, and by threading the yarn or thread back and forth between the guide rollers 20, it is brought a plurality of times in singeing relation to the burner before passing to the reel, thereby insuring a uniform and thoroughly gassed product. As the yarn is exhausted from one bobbin of each pair it will immediately be fed from the other bobbin of the same pair, whereupon the empty bobbin may be replaced by a filled one and the thread or yarn thereon may be tied to the thread or yarn on the bobbin from which the thread or yarn is being wound at that time. Thus, the machine is capable of continuous operation both as to singeing and reeling, although the singeing and reeling operation may be readily stopped at any time by simply shifting rod 30 to the right. The latter operation moves the yarn and the burner away from each other so

that the yarn is shifted out of singeing relation to the burner immediately in advance of rendering reel **6** inoperative. The latter operation is had by permitting slight movement of bar **30** to separate the yarn and the burner before pin **35** engages belt shifter **11**, after which movement of belt shifter **11** causes transfer of the driving belt from fast pulley **7** to loose pulley **8** and discontinues the driving of reel **6** as well as restraining said reel **6** from further rotation by reason of the usual operation of the brake consisting of drum **9** and band **10**.

The particular embodiment illustrated and described is very simple and efficient and will be found thoroughly practical as well as economical to manufacture and install.

What I claim as new is:

1. The combination of a suitable support, spaced thread guides, a thread singeing member carried by said support intermediate said thread guides, said thread guides and said singeing member being movable toward or away from each other to bring the singeing member into or out of singeing relation with the thread, and means for simultaneously moving said thread guides and said singeing member toward or away from each other.

2. The combination of a suitable support, spaced thread guides, a thread singeing member carried by said support intermediate said thread guides, said thread guides and said singeing member being movable toward or away from each other to bring the singeing member into or out of singeing relation with the thread, means for simultaneously moving said thread guides and said singeing member toward or away from each other, said singeing member comprising a burner, and said last-named means comprising a crank having operative connections with the thread guides and said burner.

3. In combination, a bobbin support, a reel for winding thread or yarn from bobbins on the bobbin support into skeins onto said reel, thread guiding means intermediate the bobbin support and said reel including spaced vertically shiftable thread or yarn guiding elements, a thread or yarn singeing burner vertically movable toward and from the yarn where exposed between said spaced guides, and means to simultaneously shift said spaced guides and burner toward or away from each other to bring the burner and yarn into or out of singeing relation.

4. In combination, a bobbin support, a reel for winding thread or yarn from bobbins on the bobbin support into skeins onto said reel, thread guiding means intermediate the bobbin support and said reel including spaced vertically shiftable thread or yarn guiding elements, a thread or yarn singeing burner vertically movable toward and from the yarn where exposed between said spaced guiding elements, and means to simultaneously shift said spaced guides and burner toward or away from each other to bring the burner and yarn into or out of singeing relation, said last-named means including a rotatable crank member operatively connected to the spaced thread or yarn guiding elements and the yarn singeing burner, and a horizontally movable operating bar operatively connected to said crank member.

5. In combination, a bobbin support, a reel for winding thread or yarn from bobbins on the bobbin support into skeins onto said reel, thread guiding means intermediate the bobbin support and said reel including spaced vertically shiftable thread or yarn guiding elements, a thread or yarn singeing burner vertically movable toward and from the yarn where exposed between said spaced guiding elements, means to simultaneously shift said spaced guides and burner toward or away from each other to bring the burner and yarn into or out of singeing relation, said last-named means including a rotatable crank member operatively connected to the spaced thread or yarn guiding elements and the yarn singeing burner, a horizontally movable operating bar operatively connected to said crank member, and means operatively connected with said horizontally movable operating bar for automatically rendering said reel inoperative when the burner and yarn are brought out of singeing relation and for rendering said reel operative when the burner and yarn are brought into singeing relation.

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