Nov. 8, 1938. O. I. JUDELSHON 2,135,668

SPOOLING MACHINE

Filed May 29, 1936 2 Sheets-Sheet 1

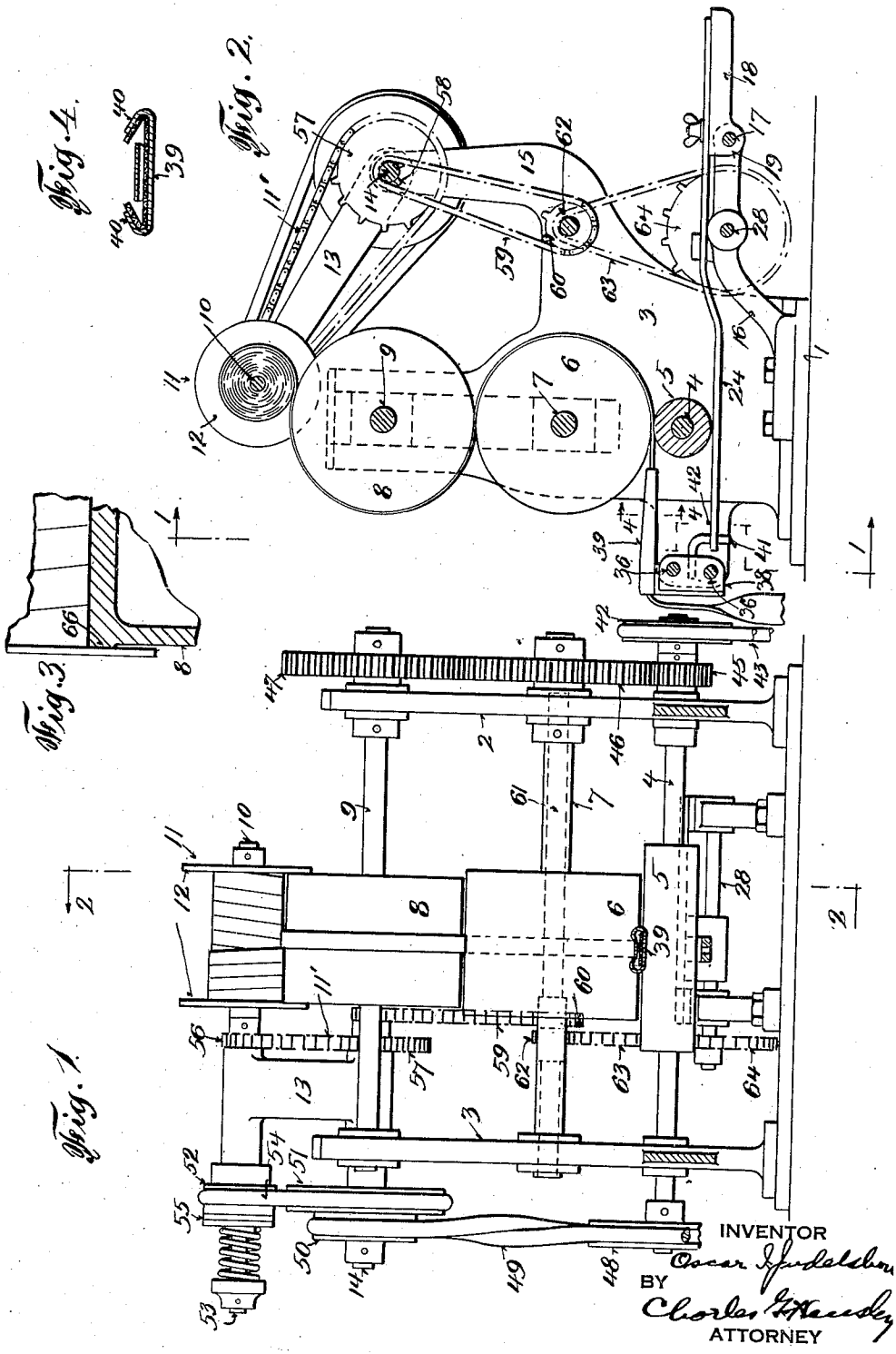


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

INVENTOR
Oscar I. Judelshon
BY
Charles H. Handley
ATTORNEY

Nov. 8, 1938. O. I. JUDELSHON 2,135,668

SPOOLING MACHINE

Filed May 29, 1936 2 Sheets-Sheet 2

Fig. 5.

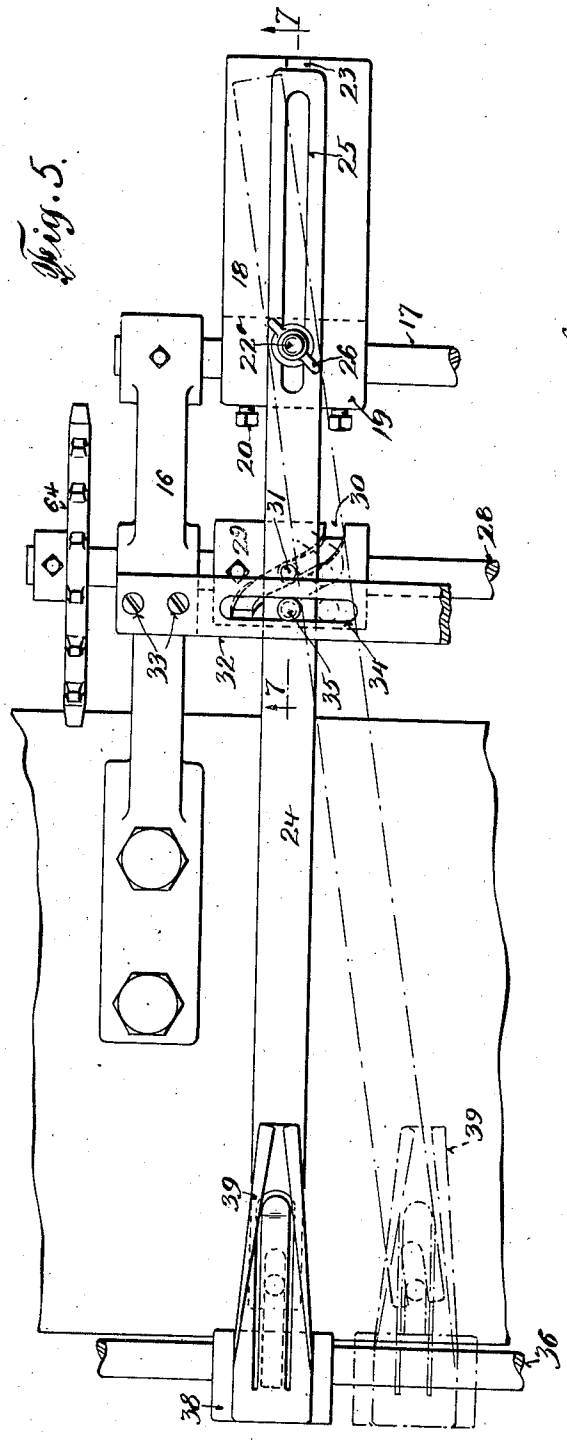


Fig. 7.

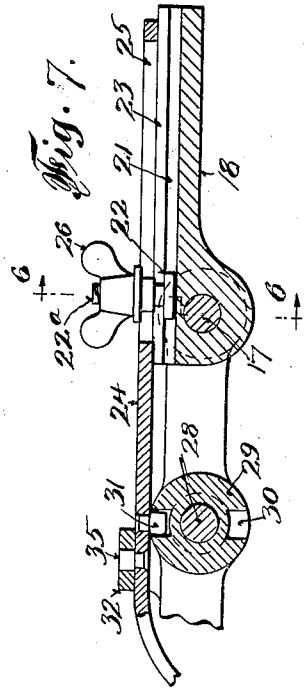
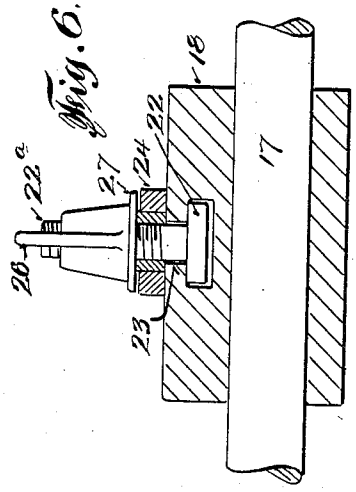


Fig. 6.



INVENTOR
Oscar I. Judelshon
BY
Charles H. Kinsley
ATTORNEY

Patented Nov. 8, 1938 2,135,668

UNITED STATES PATENT OFFICE

2,135,668

SPOOLING MACHINE

Oscar I. Judelshon, Park Ridge, N. J.

Application May 29, 1936, Serial No. 82,472

8 Claims. (Cl. 270—86)

In Letters Patent No. 1,267,080 dated May 21, 1918, and issued to me, I showed and described what is known as a spooling machine. The present invention is adapted to perform the same work as the machine shown in said patent but in a better and improved manner. Machines of this type are adapted to fold one or both of the side edges of a strip of fabric to render the same suitable for use as binding material and the machine is also adapted to smooth or iron the material as it is folded and to then wind it on a spool in helical form, so that the material will be wound upon a spool the flanges of which are several times wider than the single strip of fabric.

In the machine shown in my aforesaid patent the folded fabric is passed partly around a single pressing roller before it begins to wind upon the spool and this roller is heated in order that the folded fabric will be ironed by the action of the heated roller preparatory to winding upon the spool. One object of the present invention is to provide a plurality of rollers, preferably two, acting as pressing rollers and in successive relation so that the folded fabric travels partly around the first roller and thence around the second roller before it is wound upon the spool. The rollers are so arranged that the fabric is bent or curved in reverse directions while travelling around the two presser rollers and this has the effect of bending the fabric in reverse directions, thereby more perfectly pressing it into a condition where it will readily wind upon the spool and so that it will be in better condition when removed from the spool and straightened out for use as a binding material.

In other words, the folded fabric is in much better condition if bent in reverse directions at the time of folding and winding than if only bent and curved in one direction.

While the second roller may be heated by a burner or other means, I have found that there will be sufficient heat conducted or radiated from the first roller onto the second roller so that the latter does not need independent heating means.

Another object of my invention is to provide a machine having a plurality of pressing rollers wherein the second or final roller is of such length as to engage between the flanges of the spool and with the first pressing roller made slightly longer than the second roller, as I have found that it is necessary to have the traverse move the strip of fabric in a wider path adjacent the first pressing roller in order to have the fabric wind the full width or distance between the flanges of the spool. For this reason I find it necessary to make the first pressing roller longer than the second one if two rollers are to be used, and if the fabric is to be wound the full distance between the flanges of the spool.

Another object of my invention is to provide a very simple and readily adjustable traverse device for vibrating the folder. The traverse device is readily adjustable to vary the thrust or extent of traverse of the folder to adapt its movement to the particular size of spool on which the material is wound. This traverse operating device is located in the present machine under the rollers where it will be out of the way. The machine also includes a simple drive for operating the several parts referred to herein.

In the drawings forming part of this application,

Figure 1 is a cross sectional view taken on the line 1—1 of Figure 2 and shows the principal parts of the machine in front elevation,

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a detailed sectional view showing how the second pressing roller fits closely to the inner surfaces of the flanges of the spool,

Figure 4 is a sectional view taken on the line 4—4 of Figure 2 and showing in cross section one type of folder for folding the edges of the fabric,

Figure 5 is a view showing in plan the traverse device and its method of adjustment,

Figure 6 is a sectional view taken on the line 6—6 of Figure 7, and

Figure 7 is a sectional view taken on the line 7—7 of Figure 5.

I have shown the machine mounted on the base 1 with the frame consisting primarily of two end standards 2, 3 spaced apart in parallel relation to support the various working parts of the machine. There is a shaft 4 journaled in the end standards and it carries a roller 5 adapted to hold the fabric pressed against the first or primary pressing roller. The primary pressing roller designated 6 is mounted just above the roller 5 upon a shaft 7 which is also journaled in the end standards of the machine. Just above the primary pressing roller and in parallel relation thereto there is mounted a second pressing roller 8 which is carried upon a shaft 9 which is also journaled in the end standards of the machine.

Preferably, the second pressing roller is parallel with the primary pressing roller and close enough thereto to press the fabric which is passing from the primary to the secondary pressing roller.

Above the secondary pressing roller there is arranged an arbor 10 upon which the spool 11 to receive the folded fabric is detachably mounted, the spool having parallel end flanges 12 between which the strip of fabric is to be wound. The arbor which carries the spool is journaled in one end of the swinging arm 13, the latter being fulcrumed upon a shaft 14 which is itself mounted on the upper end of a bracket 15 carried by one of the end standards. The spool carried by the arbor 11 is, by reason of the pivotal motion of the arm 13 permitted to move downwardly by gravity so that the core of the spool and subsequently the fabric built thereon, is adapted to rest upon the secondary pressing roller. As the fabric is built up on the spool the arm 13 gradually moves upwardly, with the fabric on the spool resting against the periphery of the secondary pressing roller.

It may be here stated that the upper pressing roller is preferably made a few thousandths of an inch larger in diameter than the primary pressing roller in order that the fabric will be slightly put under tension as between the primary and secondary pressing rollers to exert enough pressure of the fabric against the pressing rollers.

The traverse device is disposed horizontally under the working parts of the machine to avoid the use of the depending brackets 54 in my said patent and thus makes the machine more compact and it puts the operating device of the traverse where it will be out of the way.

There is a bracket 16 attached to the bed of the machine and extending rearwardly, the bracket being duplicated at opposite sides of the machine, and the pair are connected with each other by a cross bar 17. There is a plate or support 18 having a hub 19 which is slipped over the bar 17, the plate being secured in stationary position by the set screws 20 which lock against the bar 17.

This plate is provided with a T shaped channel 21 extending lengthwise thereof, in which travels the head 22 of a bolt, the latter travelling in the vertical portion 23 of the T slot and the head of the bolt being adapted to be pressed upwardly against the under side of the T slot. This bolt passes through the longitudinal slot 25 of a long lever 24 and it is provided with the wing nut 26 on the top, under which is a washer 27 adapted to lie on the top surface of the lever 24. The lever 24 is itself provided with the longitudinal slot 25 to permit the bolt to be placed in various positions along the plate 18 and along the lever 24. This bolt determines the point of fulcrum of the lever 24 which carries the traverse device.

Upon the shaft 28 there is mounted a revolvable cam 29 having a continuous cam groove 30 which engages and acts upon the pin 31 which is fixed to the lever 24. The purpose of this cam is to rock the lever 24 which carries the traverse device, so that the lever makes one complete movement back and forth at each revolution of the shaft 28. I have provided a plate 32 which is mounted by means of screws 33 upon the hubs of the brackets 16 and this plate has an elongated slot 34 extending transversely of the machine. The pin 35 which is secured to the lever 24 travels in this transverse slot. Its purpose is to so modify the movement of the lever 24 that the forward or left hand end of this lever in Figure 5 will move substantially in a rectilinear direction instead of sweeping through the arc of a circle.

It will be apparent that the thrust or swing of the lever 24 may be regulated by slacking off the thumb nut 26 and moving the bolt along the T slot 21 and along the slot 25 of the lever, and again tightening the bolt in its new position.

As the lever is swung by the action of the cam 29 the nearer the bolt 22^a is to the cam, the greater will be the thrust of the left hand end of the lever in Figure 5, whereas the farther the bolt 22^a is adjusted from the cam, the lesser will be the thrust of the left hand end of the lever arm. This adjustment is made to accord with the distance between the flanges of the spool on which the material is wound.

There are two shafts 36, mounted in brackets 37 on the front of the standards of the machine, these shafts being parallel with each other; and there is mounted to slide on these shafts a carrying block 38 in which is mounted the folder 39. This folder is adapted to fold over one or both of the edges of the fabric, as shown more clearly in Figure 4. Folders of this type are well known in the art and they are made in different forms, according to the work to be accomplished. Some folders are made with a single lip 40 at only one side to fold only one edge of the fabric, leaving the other edge flat. Some are made with two lips 40, one at each side to simultaneously fold over both edges of the fabric, as shown in Figure 4, and others are made in various complex shapes for accomplishing different results. Whatever the type of folder, it is mounted on the block 38 to slide laterally of the machine, and its purpose is to fold the fabric and to feed it in folded condition to the first pressing roller 6, that is, through the bight of the rollers 5 and 6. The block 38 is provided with an angularly shaped bar 41, one end of which extends downwardly and passes through the fork 42 formed on the left hand end of the lever 24 in Figure 5.

It will be observed that as the lever 24 is rocked by the cam 29 the fork 42 acting on the rod 41 causes the block 38 to be reciprocated along the shafts 36 and as this block carries the folder it causes the latter to be moved in the direction of the axis of the rollers 5 and 6 so that while the fabric is being folded, it is also being moved laterally to effect traverse of the fabric on the spool, as will be pointed out.

The operating mechanism for the machine consists of the following: On the shaft 4 I have shown a pulley 43 adapted to be operated by a belt 44 from any source of power, so that the power for operating the machine is supplied primarily to the shaft 4. There is a pinion 45 on this shaft which meshes with and drives the gear 46 which is on the shaft 7 of the lower pressing roller, whereby power is applied to operate the latter. On the shaft 9 of the upper pressing roller there is a gear 47 which meshes with and is driven by the gear 46 on the shaft 7. Through these several gears power is applied from the shaft 4 to operate both pressing rollers, and while both have the same number of revolutions, the upper pressing roller 8 is preferably a few thousandths of an inch larger than the lower roller 6 so that the material will be put under tension.

On the shaft 4 there is a pulley 48 around which engages an endless, crossed belt 49 which also engages around a pulley 50 loosely mounted on the shaft 14. Alongside this pulley and attached to it is another pulley 51 in line with the pulley 52 on the shaft 53 and the endless belt 54 travels around both of these pulleys. It will be seen that through these belts and pulleys power is transmitted from the shaft 4 to

the upper shaft 53. Between the shaft 53 and the spindle 10 on which the spool is mounted, there is a slip clutch 55 similar to my aforesaid patent, so that the spindle may slip in relation to the shaft 53.

The power for operating the traverse device is taken from the spindle 10 in order that its speed will correspond with the speed of revolution of the spool. For this purpose I have provided means for transmitting power from the spindle 10 to the shaft 28 which carries the traverse cam 29 as follows:

There is a sprocket 56 fixed to the spindle 10 to revolve therewith, and there is an endless chain 11 engaging over this sprocket and also engaging around the sprocket 57 which is mounted on the shaft 14. On the shaft 14 there is mounted a small sprocket 58 and around this engages an endless chain 59 which also engages around the sprocket 60 arranged on the shaft 61 which has its bearings in the brackets 15. On this shaft there is a small sprocket 62 and the endless chain 63 engages around this sprocket and also around the larger sprocket 64 which is mounted on the shaft 28 which carries the traverse cam.

Through these several chains and sprockets the power will operate the traverse device as transmitted from the spindle 10 so that if this spindle operates at any speed different from the shaft 14, the traverse device will operate in accordance with the number of revolutions of the spindle 10 and the traverse of the material will accord with the revolutions of the spool and therefore it will build up regular layers on the spool, as shown in Figure 1. When power is supplied to the shaft 4 the two pressing rollers will be operated through the chain of gears and the roller 5 will be revolved in accordance with the operation of the pressing rollers.

The power applied to the belts and pulleys will be transmitted to the shaft 53 so that the speed of revolution of this shaft will be something greater than the intended speed of the spindle 10, or in other words, the spool, even at the beginning of the operation, will be revolved sufficiently fast to take the material from the pressing rollers and there will be a slippage as between the spindle 10 and the shaft 53, which slippage will vary as the size of the material wound on the spool changes.

The power transmitted from the spindle 10 through the chains and sprockets will revolve the shaft 28 which carries the traverse cam, so that the folder 39 carried by the lever 24 will be reciprocated along the bars 36 to feed the folded material between the roller 5 and the pressing roller 6. The traverse action of the folder will cause the material to be fed in spiral form onto the spool in the manner shown in Figure 1. By adjusting the position of the wing nut 26 and its bolt, the thrust of the folder along the rods 36 may be regulated so that the material will wind upon the spool from the face of one flange 12 of the spool to the other. As the power for driving the traverse device is taken from the spindle 10, the reciprocations of the traverse device will accord with the revolutions of the spool, notwithstanding the fact that the size of the body of material on the spool is gradually built up from the core towards the outer extremities of the flanges 12.

The traverse device must make a stroke slightly greater than the width of the pressing roller 8, in order to have the material wind close up to the flanges 12 and to provide for this the roller 6 is made slightly longer than the roller 8 in order that the material, as it reaches the end of the thrust with the folder will not ride off this roller 6. The roller 8, on the other hand, is made to fit between the flanges 12, but the material will not run off this roller notwithstanding its greater thrust on the roller 6.

The lower roller 6 is heated as by gas burners arranged to project into one end of the roller, and while the roller 8 may be similarly heated I have found that sufficient heat is derived by conduction and radiation from the roller 6 so that independent heating of the roller 8 is not necessary.

As the material leaves the folder it passes counterclockwise around the roller 6 and is therefore bent in one direction. It then travels clockwise, partly around the roller 8, so that it is bent in the opposite direction to what it was on the roller 6 and this double bending action of the pressing rollers has an effect upon the strip which tends to permit the strip to be readily straightened out after the spool has been removed from the machine and the material is about to be used for binding or other purposes.

I prefer to provide a lateral flange 66 at each end of the upper pressing roller 8 which flanges can lie snugly against the opposing faces of the flanges 12 of the spool without having the major portions of the roller 8 engaging the surfaces of these flanges.

Having described my invention, what I claim is:

1. A spooling machine having a folder for folding over the edges of a strip of fabric passing therethrough, a primary pressing roller around a portion of which the folded strip of fabric engages, a secondary pressing roller around a portion of which the strip of fabric feeding from said primary roller engages, the fabric so engaging the pressing rollers that the strip of fabric is bent in reverse directions when engaging the several pressing rollers, and means for winding up the strip of fabric.

2. A spooling machine having a folder for folding over the edges of a strip of fabric passing therethrough, a primary pressing roller around a portion of which the folded strip of fabric engages, a secondary pressing roller arranged with its periphery in close proximity with the periphery of the primary pressing roller, the fabric feeding from said primary pressing roller engaging around a portion of the secondary pressing roller in such manner that the strip of fabric is bent in reverse directions when engaging the several pressing rollers, and means for winding up the strip of fabric.

3. A spooling machine having a folder for folding over the edges of a strip of fabric passing therethrough, a primary pressing roller around a portion of which the folded strip of fabric engages, a secondary pressing roller arranged with its periphery in close proximity with the periphery of the primary pressing roller, the fabric feeding from said primary pressing roller engaging around a portion of the secondary pressing roller in such manner that the strip of fabric is bent in reverse directions when engaging the several pressing rollers, and a spindle having means on which the strip of fabric is adapted to be wound, said secondary pressing roller having a slightly greater diameter than said primary pressing roller, and means for driving said pressing rollers in unison.

4. A spooling machine having a folder for fold-

ing a strip of fabric passing therethrough, a primary pressing roller around a portion of which the folded strip of fabric engages, a secondary pressing roller around a portion of which the strip of fabric from said primary roller engages, the fabric so engaging the pressing rollers that it is bent in reverse directions when engaging the pressing rollers, a spindle having a spool provided with flanges spaced apart the length of said secondary pressing roller whereby the latter may be received between said flanges, means for causing the traverse of said folder to effect the feeding of the fabric upon the spool in spiral form, said primary pressing roller being of greater length than said secondary roller.

5. In a spooling machine, a frame, pressing rollers mounted thereon, a carrying member below the pressing rollers having a folder mounted thereon, means for guiding said carrier to move in a rectilinear direction, a lever for reciprocating said carrier, said lever having a slot, a fulcrum bolt engaging in said slot and permitting the lever to pivot in relation thereto, a cam, a pin on said lever engaging the said cam to cause the lever to be rocked from said fulcrum bolt, and a stationarily mounted slotted guiding member, said lever having a pin engaging in the slot of the guiding member so that said pin is confined to a rectilinear movement laterally of the length of said lever.

6. A spooling machine including a pressing roller, a reciprocating carrier arranged at the front of the machine and carrying a folder adapted to feed and fold a strip of fabric onto the pressing roller, a lever mounted below the pressing roller, in substantially horizontal position, and extending backwardly of the machine from said carrier, said lever adapted to reciprocate said carrier to cause a traverse of the folder, and a cam disposed behind the pressing roller for rocking said lever to reciprocate the carrier.

7. A spooling machine having a folder for folding over the edges of a strip of fabric passing therethrough, a primary pressing roller around a portion of which the folded strip of fabric engages, a secondary pressing roller shorter than the primary roller around a portion of which the strip of fabric from said primary roller engages, a suitably supported spool having flanges overlapping the ends of the secondary pressing roller, and means for moving the fabric axially of the spool while winding.

8. A spooling machine having a folder for folding over the edges of a strip of fabric passing therethrough, a primary pressing roller around a portion of which the folded strip of fabric engages, a secondary pressing roller shorter than the primary roller around a portion of which the strip of fabric from said primary roller engages, a rotatably mounted spool for receiving the fabric issuing from the secondary roller, and means for effecting the traverse of said fabric proportional to substantially the length of the secondary roller and less than the length of the primary roller for feeding the fabric upon the spool in spiral form.

OSCAR I. JUDELSHON.