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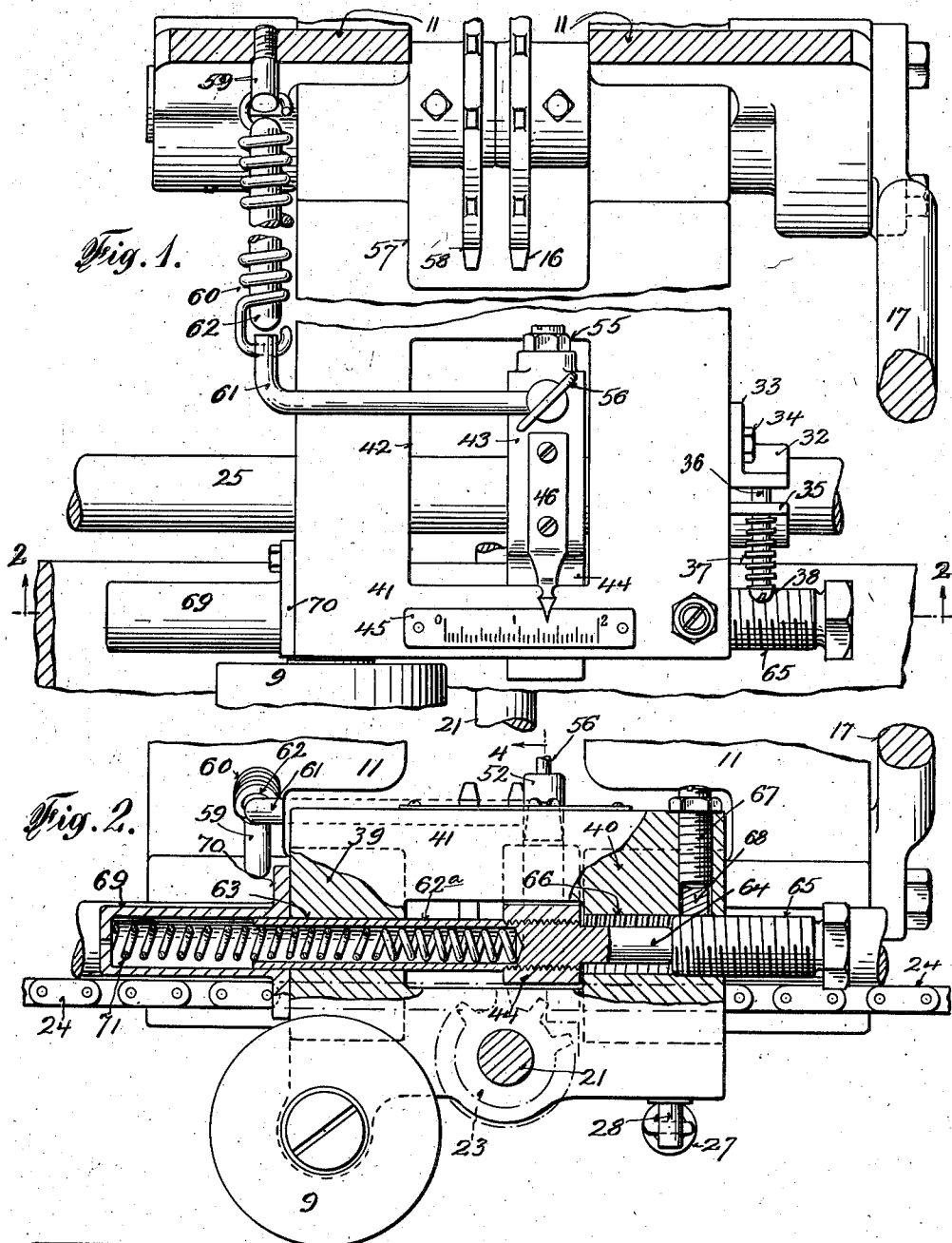
O. I. JUDELSON

2,074,846

CUTTING MACHINE

Filed Feb. 1, 1936

4 Sheets-Sheet 1



INVENTOR.
Oscar I. Judelson
 BY
Charles Hensley
 ATTORNEY

March 23, 1937.

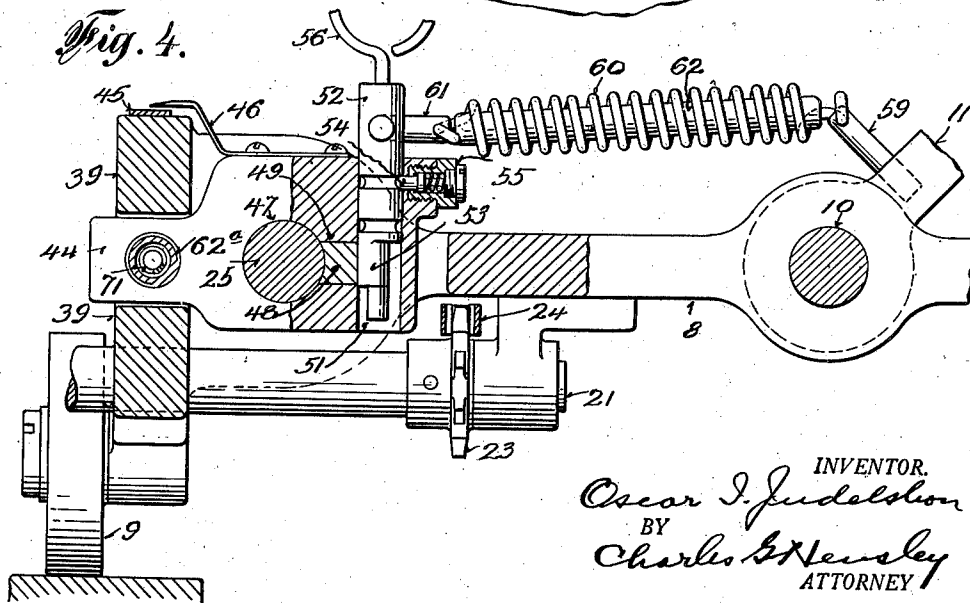
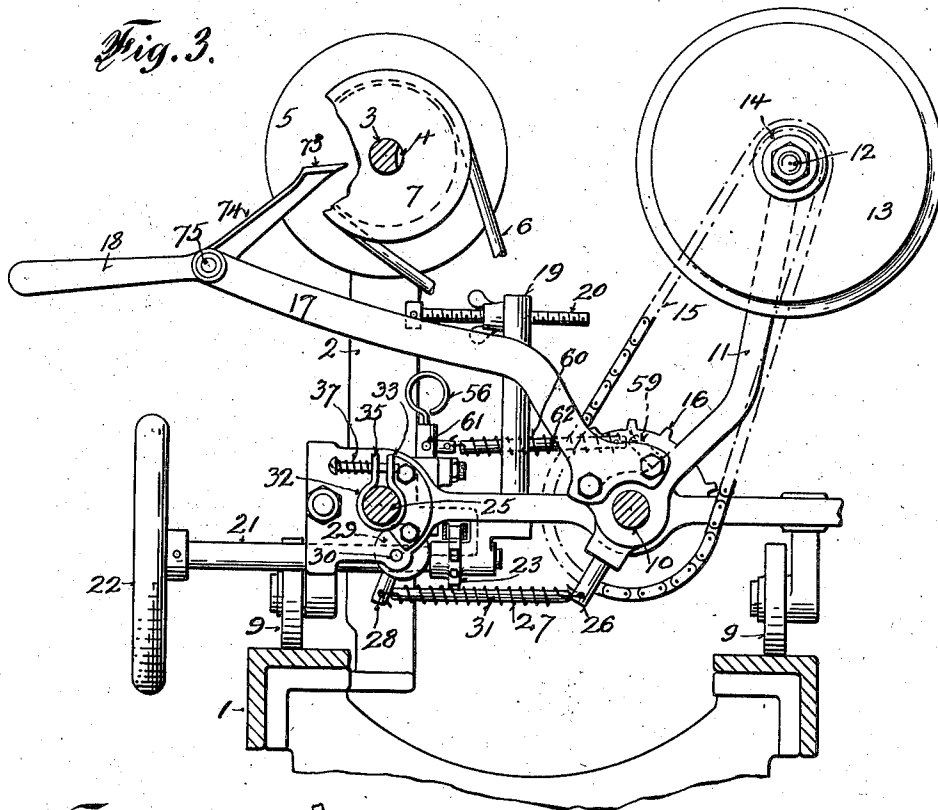
O. I. JUDELSHON

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CUTTING MACHINE

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4 Sheets-Sheet 2



INVENTOR.
Oscar I. Judelson
BY
Charles S. Newley
ATTORNEY

March 23, 1937.

O. I. JUDELSHON

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CUTTING MACHINE

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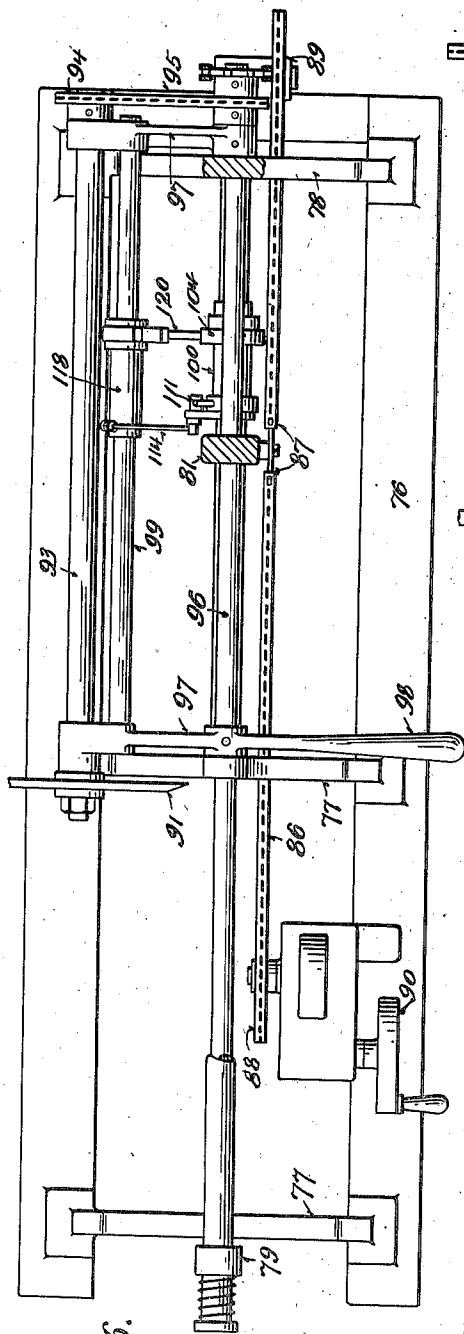


Fig. 6.

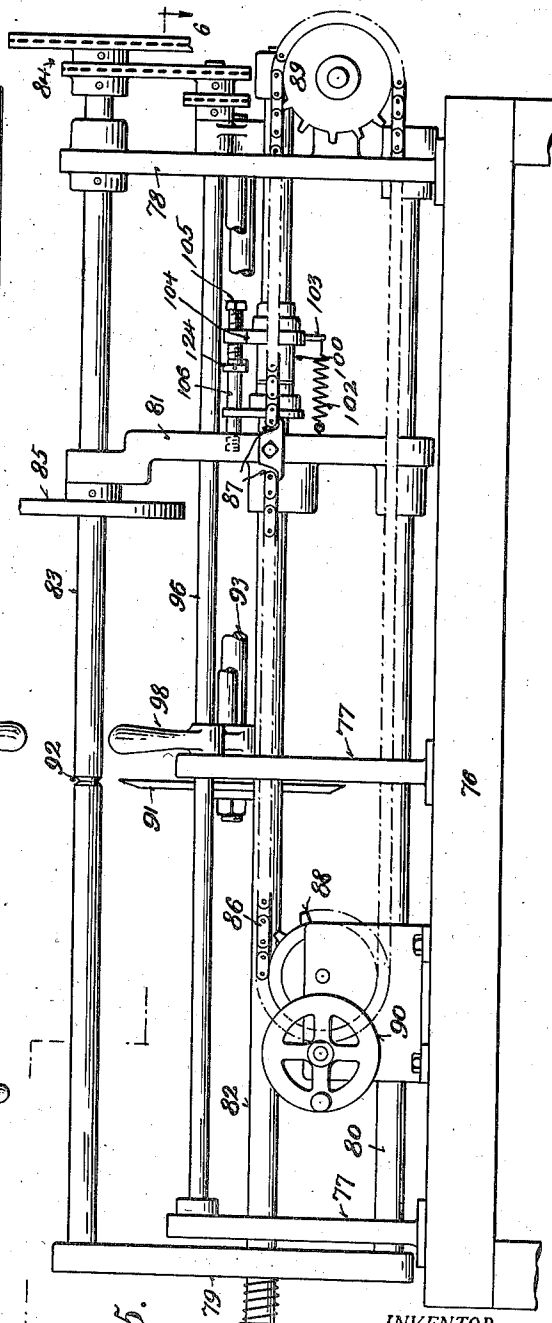


Fig. 5.

INVENTOR.
Oscar I. Judelson
BY
Charles S. Mansley
ATTORNEY

March 23, 1937.

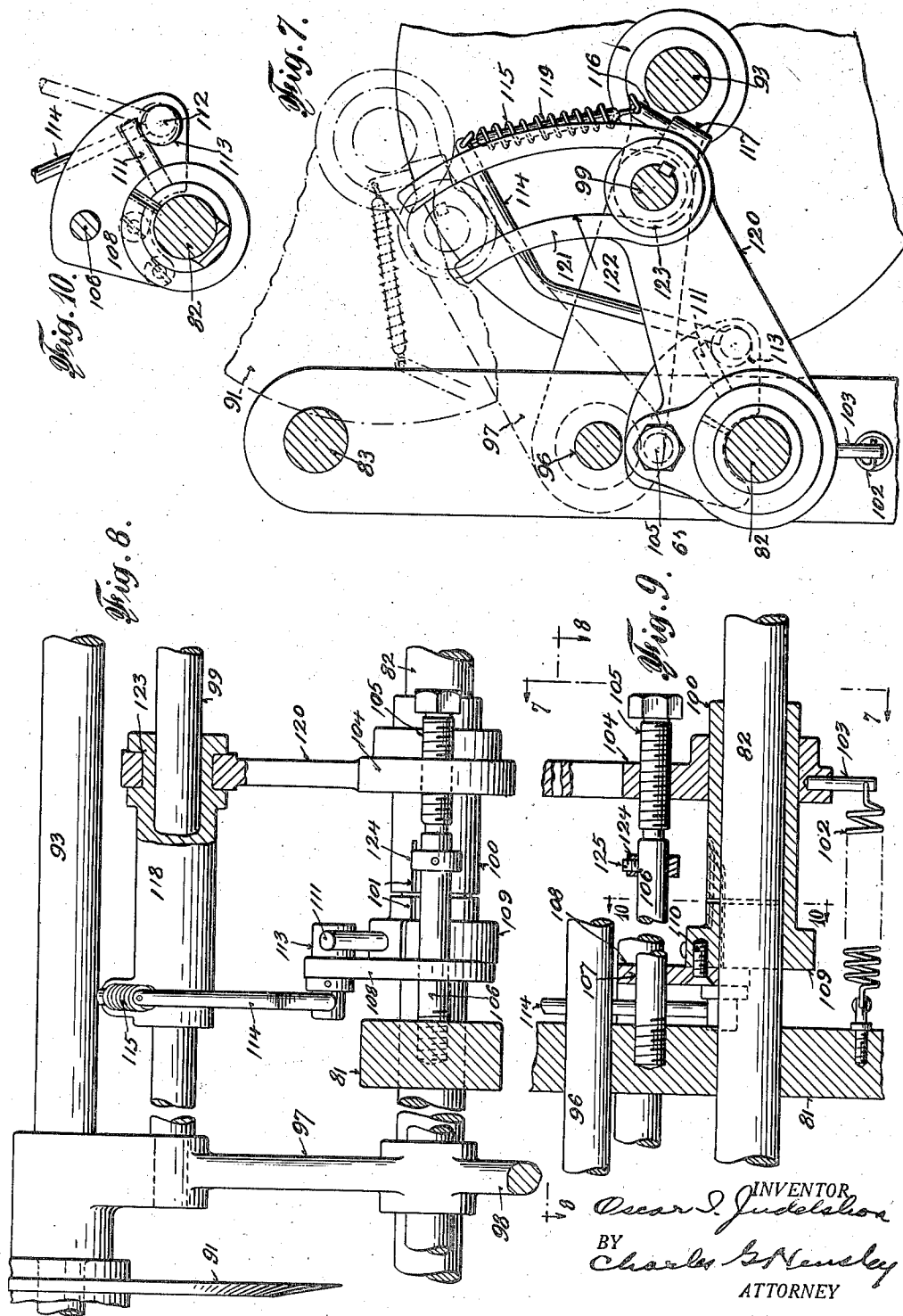
O. I. JUDELSON

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CUTTING MACHINE

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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,074,846

CUTTING MACHINE

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

Application February 1, 1936, Serial No. 61,846

12 Claims. (Cl. 164—69)

My invention is applicable more particularly to machines for cutting fabric and other materials, although the same may be applicable to other types of machines. I have illustrated my invention as applied to machines for cutting long rolls of fabric and similar material into relatively narrow discs, each disc containing a strip of the material which may be used for binding purposes. I have illustrated my invention as applied to both types of cutting machines now in general use.

In one type of cutting machine, known as the "Judelshon" machine shown in U. S. Patent No. 1,242,448, the roll of fabric is supported on a stationary shaft extending lengthwise of the machine and the revolving knife is mounted on a carriage which is movable progressively and parallel with the fabric shaft, in order that the knife may be moved as each disc is cut from the roll of fabric until the entire roll has been cut into discs by the cutting knife. In this type of machine the roll of fabric is held by a chuck at one end which is revolved so that the shaft on which the fabric is mounted may remain stationary. The shaft is provided with a longitudinally extending groove which permits the cutting edge of the knife to project into the groove without touching the shaft, in order to insure a complete cut through the fabric.

In the other type of cutting machine, commonly known to the trade as the "Adams" machine shown in U. S. Patent No. 878,705, the shaft on which the fabric is mounted is revolved and carries the fabric with it, and there is a circumferential groove in the shaft into which the edge of the knife may project slightly to insure the knife passing completely through the roll of fabric.

In this type of machine the roll of fabric is moved along its shaft because the cutting knife has a stationary position. It is unnecessary to compare these two types of machines but I have shown my invention applied to each type in order to illustrate how the invention operates on both types of cutting machines.

In cutting machines of the character referred to, it is customary to make the first cut with the knife adjacent one end of the roll of fabric and in the said "Judelshon" type of machine the carriage which carries the knife is moved lengthwise of the machine after each cutting operation, according to the width of the discs into which the roll of fabric is to be cut, whereas in the "Adams" type of machine it is also customary to make the first cut near one end of the roll of fabric but to move the roll of fabric lengthwise

in relation to the knife a distance corresponding with the width of the discs to be cut from the roll of fabric.

In these machines it is customary to advance the carriage or the fabric by means of a wheel which wheel is arranged on a shaft carrying a sprocket wheel which engages a chain in order that the carriage in the one case or the roll of fabric in the other, may be advanced lengthwise of the machine after each cutting operation. Usually there is a scale which lies adjacent the periphery of the roll of fabric and lengthwise of the machine, which scale is marked off in inches so that when the operator revolves the wheel referred to above to bring the knife into a new position in relation to the knife, he is guided in the positioning operation by the scale read in relation to the end of the roll of fabric which end of course is altered as each disc of fabric is cut from the roll.

It will be apparent that in this operation of measuring the position of the knife in relation to the end of the roll of fabric, that the operator must actually measure the positions by means of the scale at each cutting operation and as thousands of such operations are performed in a day, considerable time is consumed in the operation of the machine by this positioning function. Furthermore, where an operator is obliged to measure the relation of the knife of the fabric for each cut there is apt to be a variation in the width of the several discs cut from the roll. These variations are a decided disadvantage, especially where the discs are very narrow and where they must afterwards be fed through a folder having a fixed dimension.

The object of my invention is to provide means whereby the measuring operation will be performed automatically by the machine; that is to say, when the carriage knife or the roll of fabric, as the case may be, is repositioned after each cutting operation to bring the knife into the new position in relation to the roll of fabric for the cutting of another disc, the operator need only turn the wheel which causes the movement of the carriage or the roll of fabric and an automatic device will arrest this operation at such a point that the knife will be in proper relation with the fabric to cut a disc of a given width from the roll of fabric. This eliminates the necessity of the operator performing the measuring action each time the knife carriage or the roll of fabric is moved.

This automatic action of measuring permits the operator to operate the machine much faster

and without necessarily watching the knife or the fabric.

Another advantage in the present invention is that the discs may be cut exactly true in width and all of a given width will be uniform to a much finer degree than is possible where the measuring is done manually. The present device is adjustable so that discs of any desired width may be severed from the roll of fabric. Furthermore, finer graduations in width of the discs may be obtained than with manual measuring because the width of the discs may be regulated to finer graduations than the markings on the scale, if desired. Another feature of the invention is that where the machine is set to cut discs of a given width, say for example, one inch, and if it becomes desirable to cut a single disc, say, of a narrower width, the machine may be operated to cut the single disc of narrower width and on the next operation the machine will again cut one inch discs, so that without thought on the part of the operator the machine returns to the cutting of discs of the width for which it is primarily set. If more than one narrow disc is to be cut from the roll of fabric in between the cutting of the regular width discs, the operator will reset the stop device for each special or narrow disc to be cut.

I have embodied in the present application a device for positively locking the knife carriage during each cutting operation, which device is shown and described in the patent issued to me on the 27th day of March 1934 and numbered 1,952,209.

This device is a preferred means for locking the carriage automatically when the knife begins to move towards the cutting position and holding the carriage until the knife is withdrawn from the roll of fabric, in order that there shall be no movement as between the knife and the carriage during the cutting action and during the retraction of the knife from the roll of fabric.

Other objects and advantages of my invention will be set forth in the following detailed description of my invention.

In the drawings forming part of this application,

Figure 1 is a horizontal, sectional view of a portion of a cutting machine of the type shown in Patent No. 1,242,448 in which various parts are shown in plan and in which some parts of the machine such as the chains for driving the knife, are omitted,

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

Figure 3 is a cross sectional view of the same type of machine in which the principal parts are shown in end elevation and in which one part is shown broken away,

Figure 4 is a sectional view taken on the line 4—4 of Figure 2,

Figure 5 is a front elevation of a machine of the type shown in Patent No. 878,705 and illustrating my invention applied thereto,

Figure 6 is a sectional view taken on the line 6—6 of Figure 5,

Figure 7 is a sectional view taken on the line 7—7 of Figure 9,

Figure 8 is a sectional view taken on the line 8—8 of Figure 9,

Figure 9 is a detailed sectional view showing a portion of the automatic stop device, and

Figure 10 is a sectional view taken on the line 10—10 of Figure 9.

I will first describe the form of my invention shown in Figures 1 to 4 inclusive and as applied to the "Judelshon" type of cutting machine. For a complete illustration of this type of machine reference may be had to my U. S. Patents Nos. 1,952,209 and 1,242,448 aforesaid.

The machine includes a frame 1 (see Figure 3) only a portion of which is illustrated herein, and brackets 2 extending upwardly from this frame support at the upper portion of the machine a shaft 3 on which the roll of fabric is adapted to revolve, the shaft being non-revolving or stationary and it is provided with a longitudinal groove 4 into which the edge of the cutting knife may project slightly to insure a complete cut through the entire roll of fabric. The roll of fabric which is revolvable on this shaft is gripped by a chuck 5 such as is shown in my said patent, the chuck being revolved by means of a belt 6 acting on the pulley 7 so that the chuck and the roll of fabric are revolved while the shaft 3 which supports the fabric remains stationary.

There is a carriage 8 which carries the cutting knife, and this is provided with rollers 9 which roll along the top surface of the frame of the machine so that the carriage is movable lengthwise of the machine. This carriage is slidable along the shaft 10 which is stationarily supported in the frame of the machine, and there is loosely journaled on this shaft a lever having an arm 11 which at its upper end supports an arbor 12 on which the circular cutting knife 13 is carried.

On this arbor there is also mounted a sprocket wheel 14 around which engages an endless chain 15 and this chain also engages around a larger sprocket 16 which is mounted on the shaft 10 so that power is transmitted from the sprocket 16 to the sprocket 14 to revolve the cutting knife at high speed. For the remainder of the mechanism, that is, for the means for revolving the sprocket 16, reference may be had to my said patent.

On the lever arm 11 there is attached another lever arm 17 which extends to the front of the machine where it is provided with an operating handle 18 which the operator may grasp in order to swing the lever arm 11 for the purpose of moving the knife against the fabric during the cutting operation and to retract the knife into the inoperative position shown in Figure 3. There is a post 19 on the carriage, having an adjustable stop screw 20 at its upper end, which acts to stop the lever arm 11 in its movement to the left in Figure 3, in order to permit the edge of the knife to move slightly into the groove 4 but to prevent it from making contact with the shaft 3. The parts here described are all similar to the corresponding parts shown in my aforesaid patent.

Extending crosswise of the carriage and mounted in suitable bearings thereon, there is a shaft 21 which carries an operating wheel 22 at the front of the machine and by means of which the operator may manually move the knife carriage lengthwise of the machine. On this shaft there is a sprocket wheel 23 the teeth of which engage between the links of the chain 24 which extends lengthwise of the machine but which is fixed in position so that when the shaft 21 and the sprocket 23 are revolved by the operation of the hand wheel 22 the carriage is caused to move along the frame on its rollers 9 toward either end of the machine, according to the direction of rotation

of the hand wheel 22. The hand wheel is revolved in one direction a partial revolution after each cutting operation, whereas it is revolved a number of times in the opposite direction after the whole roll of fabric has been cut and it is desired to return the cutting knife to the starting position to cut a new roll of fabric. There is another longitudinal shaft 25 extending along the machine adjacent the front thereof, and this shaft extends through the carriage, the shaft being non-revolvable.

The means for locking the carriage against movement during the cutting operation and the retraction of the knife, corresponds with that shown in my aforesaid Patent 1,952,209 and it consists principally of an arm 26 secured to the hub which carries the lever arm 11. One end of the coiled spring 27 is connected with the free end of the arm 26 and the other end of the spring is connected with the free end of the short lever arm 28 projecting from an eccentric 29 which is pivoted on the pin 30 of the carriage. Movement of the arm 26 causes the eccentric 29 to engage the shaft 25 to lock the carriage against endwise movement and when operated in the opposite direction the eccentric 29 is released from the shaft 25 to allow the carriage to be moved.

Within the coiled spring 27 there is disposed a rod 31 which abuts against the arm 26 at one end and the arm 28 at the other end, so that swinging movement of the arm 26 in one direction, i. e., the direction necessary to release the eccentric 29 from the shaft 25 will be a positive movement because of the rod 31, whereas when the arm 26 moves in the opposite direction or counterclockwise in Figure 3 the arm 28 will be operated through the spring 27 to move the eccentric into clutching engagement with the shaft 25. This locking device starts to move into locking position when the handle 18 is pressed down, for the purpose of swinging the knife into cutting relation with the roll of fabric, and the eccentric continues to grip the shaft 25 until the cutting operation is completed and until the handle 18 is moved upwardly and the knife is withdrawn from the roll of fabric and returned or nearly returned to the position shown in Figure 3, and at that time the arm 26 will have acted through the rod 31 upon the arm 28 to positively disengage the eccentric from the shaft 25. When this occurs, the carriage is unlocked and it can be moved lengthwise of the machine by the operation of the wheel 22.

I prefer to provide a friction device to prevent a too free movement of the carriage on the frame, and for this I have shown a strap 32 surrounding the shaft 25 and having at one end a bracket 33 connected by the bolt 34 to the frame of the carriage. The other end 35 of the strap is disposed parallel to a portion of the bracket 33 and there is a rod 36 having one end fixed in the bracket 33 the rod extending through an aperture in the member 35 and being provided with a coiled spring 37 surrounding the rod and compressed between the head 38 of the bolt and the member 35 to exert a slight closing pressure of the strap on the shaft, in order to provide a light frictional resistance to the movement of the carriage, in order that it will not move through the mere vibration of the machine but only under the action of the wheel 22.

The carriage frame has vertically disposed beams 39, 40 (see Figure 2) extending crosswise of the machine and adjacent the front thereof,

which beams are connected at their ends by the cross member 41 at the top of the beams, the construction providing an opening 42 through the frame of the carriage in which the controlling block is adapted to move. The controlling block 43 having a reduced portion 44 (see Figure 4) between the beams 39, 40 is of such a width in relation to the distance between the beams that it may move longitudinally of the machine and in relation to the frame of the carriage a distance which corresponds with the maximum adjustment of the automatic device, which, in the drawings, is indicated as two inches in accordance with the scale 45 attached to the top of the member 41. This sliding block is provided with a pointer 46 on its top surface which reaches over and co-operates with the markings on the scale 45 to indicate the setting of the block and therefore the width of the discs to be cut from the roll of fabric.

This block has an aperture 47 through which the shaft 25 extends and there is a shoe 48 arranged to slide laterally in an opening 49 of the block so that the curved surface 50 of this block may engage against the surface of the shaft 25 and lock the block against movement lengthwise of the machine. Extending vertically into the vertical opening 51 of the block there is a post 52 having an eccentric portion 53 which is adapted to act against the right hand end of the brake shoe 48 in Figure 4 for the purpose of pressing this shoe into locking engagement with the shaft 25 or to release the shoe when the block is to be moved along the shaft.

There is a key 54 which is adjustable horizontally in a plug 55 and this key engages in the keyway 56 of the post 52 to hold the latter in place in the vertical socket 51 but permitting the post to revolve. On the upper end of the post I have shown the hand ring 56 for manually turning the post 52 to release the brake shoe, for instance when the carriage is to be returned from one end of the machine to the other after one roll of fabric has been cut and preparatory to operating on a new roll of fabric.

As shown especially in Figure 1, the arm 11 is provided with an opening 57 to provide clearance for the sprocket wheels 58 the same as in my aforesaid patent. There is attached to one portion of this lever arm a pin 59. To the free end of this pin is attached one end of a coiled spring 60, the other end of this spring being connected with a lever arm 61 which has one end passing through the oscillating post 52.

Preferably, there is a rod 62 disposed within the coiled spring 60 with one end of which the pin 59 engages and the opposite end of the rod engages the lever arm 61 so that the movement of the pin 59 in one direction will positively move the lever arm 61, whereas, when the pin 59 is moved clockwise in Figure 4 the movement will be transmitted through the coiled spring 60 to draw the lever arm 61 and apply resistible pressure to revolve the post 52 in the direction necessary to cause the eccentric portion 53 of the post to press the shoe 48 against the shaft 25.

I have shown a tubular member 62^a threaded through the portion 44 of the block 43 by which it is carried, and this tubular member extends to the left in Figure 2 and passes through an aperture 63 in one of the beams 39 it having a loose fit therein to permit the tubular member to slide horizontally and in a direction lengthwise of the machine. One end of this tubular member is shown as having a solid nose 64 directed to the

right in Figure 2, which nose is adapted to contact with the inner end of a screw plug 65 which is threaded into a bore 66 in the beam member 40. This plug may be adjusted by screwing it 5 more or less into the bore 66 so that the nose 64 will make contact with the inner end of this plug at different positions for a purpose which will be pointed out. I have shown a set screw 67 threaded into an aperture in the beam 40 and 10 this presses on the shoe 68 to lock the plug 65 in any of its adjusted positions to prevent the plug from being moved by vibration after it is adjusted.

There is a tubular housing 69 having a flange 70 at one end which is bolted against the beam 39 of the carriage and this housing telescopes over the cylindrical member 62. One end of this housing is closed and within the housing and the tubular member 62 there is a coiled spring 71 20 which presses at one end against the closed end of the housing and at the other end it presses against the solid head of the tubular member 62.

This spring is under compression and as the housing 69 is fixed to the carriage it tends to 25 move the cylindrical member 62 and with it the block 43 toward the right in Figure 2.

Operation

The operator will set the machine for cutting 30 discs of some desired width. The set screw 67 is slacked off to allow the plug 65 to be adjusted. Let us say that discs of one inch width are to be cut on the machine. The plug 65 will be turned right or left so that the cylindrical member 62 35 together with the block 43 will be moved right or left, as the case may be, in Figures 1 and 2. The nose 64 rests against the inner end of the plug 65 and continues in contact therewith during the adjustment of the plug because it is 40 pressed against it by the coiled spring 71. As the plug is adjusted the pointer 46 will move in relation to the scale 45 until the plug has been adjusted to bring the pointer to the one inch mark on the scale. The plug 65 will then be fixed in 45 this position by tightening the set screw 67.

The knife carriage may be moved lengthwise along the machine until the knife is brought near the starting end of the roll of fabric and the first cut of the knife will serve to trim off the irregular edge of the roll of fabric. It may be assumed that this has been done and that the knife is retracted to the position shown in Figure 3. The pointer 46, as just stated, is in line with the one inch mark on the scale. The knife is in line 50 with the trimmed end of the roll of fabric. It is now necessary to move the carriage so that the knife is one inch from the trimmed end of the roll of fabric. To do this the operator revolves the wheel 22 in the direction necessary to move the carriage from left to right in Figures 1 and 2, and 55 he will turn the wheel 22 as far as it will go, which will generally be a part of a revolution.

The carriage will automatically stop when the right side of the beam 39 in Figure 2 strikes 60 against the left side of the portion 44 of the block 43 because the block forms a stopping abutment for the carriage in this operation. At this time the block is held in its position by the frictional engagement of the brake shoe 48 with the shaft 25 being held there by the eccentric portion 53 70 of the post 52 this condition existing when the handle 18 is in its upper position and the knife lever is in its retracted position shown in Figure 3.

75 The above operation of the wheel 22 caused the

carriage to move from left to right in Figures 1 and 2 a distance of one inch because the setting of the block 43 from the right side of the beam 39 corresponded with one inch on the scale. This movement of the carriage placed the knife 5 in a position one inch from the trimmed end of the roll of fabric. The machine is now ready for the cutting of a one inch disc from the end of the roll of fabric.

It will be understood that the knife is revolving 10 at high speed and with the parts in the position shown in Figure 3 the operator will press downwardly on the handle 18 and the lever arm 17 being swung from the shaft 10 will carry with it the lever arm 11 in counterclockwise direction 15 in Figure 3, and this will swing the knife toward the roll of fabric. The movement will be continued (the knife cutting the fabric) until the edge of the knife has passed entirely through the revolving roll of fabric and until the edge enters partly 20 into the groove 4 of the stationary fabric shaft 3. At that time the knife will have passed entirely through the roll of fabric and a disc of one inch width will have been severed therefrom.

During the movement of the knife into and 25 through the fabric, the following action takes place in the stop device. That is to say, as the lever arm 11 moves counterclockwise in Figure 3, the pin 59 presses on one end of the rod 62 and moves it into engagement with the lever arm 61 30 and then swings this lever arm counterclockwise in Figure 1. As the lever arm is connected with the post 52, the latter is caused to turn so that the eccentric portion 53 moves away from the end of the brake block 48 thus releasing pressure 35 of the latter upon the shaft 25. This releases the block and immediately the block moves from its position against the front of the beam 39 toward the right as viewed in Figure 2 under the action of the coiled spring 71 until the nose 64 40 strikes against the left hand of the plug 65 and this arrests the sliding movement of the block in relation to the shaft 25 and in relation to the knife carriage. When the block is thus arrested its pointer 46 will be pointed at the one inch mark 45 on the scale 45.

When the operator depressed the handle 18 and swung the lever arm 11 to the left in Figure 3 to start the cutting operation, the arm 26 acted through the spring 27 to move the arm 28 and 50 therefore to turn the eccentric 29 counterclockwise in Figure 3 so that the eccentric gripped the shaft 25 and locked the carriage against endwise movement. This locking action takes place soon after the lever arm 11 starts to move forwardly and the pressure of the eccentric 29 on the shaft 25 increases so that from the time the cutting knife starts to cut into the roll of fabric the eccentric 29 has a tight grip on the shaft 25. 55

This locking of the carriage against endwise movement continues throughout the cutting operation and until the handle 18 is moved upwardly and the arm 11 moves counterclockwise, that is, until the knife withdraws from the fabric. 60

Just about as the knife is fully retracted, as shown in Figure 3, the arm 26 acts through the rod 31 to swing the arm 28 clockwise and thus release the eccentric 29 from its gripping action on the shaft 25. While the knife is in the retracted position shown in Figure 3 the carriage 70 is held against accidental movement by the strap 32 but it may be moved by turning the hand wheel 22.

The above completes one cycle of operation of the machine. To make another cut in the 75

fabric the operator will again turn the wheel 22 to move the carriage until the beam 39 strikes against the portion 44 of the stop block, thus bringing the cutting knife into position one inch from the new end of the roll of fabric. The second cut may be made by operating the handle 18 in the same manner as described above.

It will be apparent from what has been said that the stop block 43 is automatically reciprocated by the spring 71 to bring the nose 64 against one end of the plug 65 and that this action takes place soon after the handle 18 starts to move downwardly, so that the block is reset automatically for a succeeding operation. Each time the wheel 22 is operated it brings the carriage up to the position determined by the stop block as when the beam 39 comes against the stop block. Thus, the measuring action is performed automatically and the operator only has to turn the wheel 22 a partial revolution to move the carriage into a new position. The carriage is locked against movement during the cutting operation by the action of the eccentric 29 on the shaft 25 so that there can be no movement of the carriage while the cutting operation is taking place.

The above operations take place automatically with the exception of the operation of the hand wheel 22 but when the latter is operated the operator need perform no measuring operation as this is taken care of automatically by the stop block.

After the knife has progressed along the machine and has cut the entire roll of fabric into discs, the operator may grasp the member 56 and turn the post to release the eccentric 53 from the brake shoe 48, so that the carriage may be rolled all the way back to the starting position by the operation of the wheel 22 in the opposite direction to which it was operated while the cutting was taking place.

Assuming that the machine was set to cut one inch discs as set forth in the above description, if the operator desires to cut a single disc of lesser width the handle 22 will be turned to move the knife carriage. Let us say the special disc of fabric is to be cut one-half inch in width; the carriage will be thus moved until the scale 73 carried on the arm 74 which is pivoted to the lever 17 at 75 indicates in relation to the end of the roll of fabric that the knife is one-half inch from the end of the fabric. The operator will then depress the handle 18 and carry out the cutting action by moving the knife into the fabric and back, the same as for the regular cut. If desired, the operator may set the carriage for this special cut by moving it until the pointer 46 indicates the position on the scale 45. In other words, he may use the scale 73 or the scale 45 in positioning the carriage for a special cut.

Assuming the half inch disc is being cut from the roll of fabric, then as the knife is moved forwardly in this cutting operation the brake shoe 48 will be released as the knife moves forwardly and the block 43 will at that time be shifted by the spring 71 until the nose 64 strikes the plug 65. This will set the stop block in accordance with its original setting, that is, the pointer 46 will stop in line with the one-inch mark on the scale 45 so that if the special disc has been cut, if the operator does not again specially reset the carriage, the latter will be moved one inch the next time the wheel 22 is operated, or in other words, the machine will return to

automatic operation for cutting the one-inch discs as before.

I will here describe the invention as applied to the "Adams" type of machine, as shown in Figures 5 to 10 inclusive. In these views I have shown the upper part of the frame 76 of the machine on which upstanding brackets 77 are mounted, and also an end bracket 78 of greater height. There is a connecting member 79 at the left end of the machine in Figures 5 and 6. There is a lower horizontal shaft 80 mounted close to the upper part of the machine frame and having one end attached to the connecting member 79. There is a carriage 81 which is slidable along the shaft 80 and this carriage is also slidable along the shaft 82 which is disposed longitudinally of the machine above the shaft 80. At the top of the machine there is disposed longitudinally the fabric supporting shaft 83 which is adapted to be operated through a series of sprockets and chains 84 all of which are of well known construction. There is a chuck 85 for gripping the end of the roll of fabric when the latter is mounted on the fabric shaft 83 and this chuck is keyed to the shaft 83 so that it will revolve therewith and it may be slid lengthwise of the shaft in accordance with the movements of the carriage 81.

There is a chain 86 having its opposite ends connected with the carriage, as shown at 87 and this chain engages around the sprocket wheel 88 adjacent one end of the machine and around the sprocket 89 adjacent the right hand end of the machine. This chain is adapted to be operated by the hand wheel 90 which is geared to operate the sprocket wheel 88. Turning movement of the hand wheel 90 by the operator in one direction will operate the chain 86 and cause the carriage to move to the left in Figures 5 and 6, whereas turning of the hand wheel in the opposite direction will cause the chain to move the carriage to the right in Figure 6.

When the roll of fabric is first placed on the shaft 83 the carriage will be at the extreme right hand position and it will be advanced step by step at each operation of the hand wheel so as to move the roll of fabric in relation to the knife a distance corresponding with the width of the discs which are to be cut.

The revolable knife 91 operates always at the same position and the shaft 83 is provided with a circumferential groove 92 to permit the edge of the knife to move slightly therein in order to insure a complete passage of the knife through the roll of fabric. The knife is mounted on the shaft 93 one end of which is provided with the sprocket 94 to be operated by the chain 95 from the shaft 96. The shaft 93 is journaled in the two arms 97 which are mounted on the longitudinal shaft 96 which arms may swing about the latter shaft but which have no movement longitudinally of the machine. Extending from the hub of one of the lever arms 97 and projecting forwardly there is a lever arm 98 adapted to be operated by hand for the purpose of swinging the knife toward and from the roll of fabric. The parts described above, as well as the shaft 99 disposed near the rear of the machine, are all parts which are commonly present in the "Adams" type of machine.

The device of my invention is applied to this type of machine in the following manner: There is a sleeve 100 mounted upon and adapted to slide in relation to the horizontal shaft 82 and

there is a split 101 in one end of this sleeve to permit this end to be squeezed or compressed to lock against the shaft 82 to lock the sleeve on the shaft. The coiled spring 102 is connected at one end with the pin 103 which is connected with a member of the sleeve 100 and its opposite end is connected with the carriage 81 so that the tendency of this spring is to move the sleeve to the left in Figures 5, 8 and 9.

There is an enlarged ring 104 either formed integral with or attached to the right end of the sleeve 100 and there is a plug 105 threaded through this ring, as shown in Figures 8 and 9, which plug serves the same purpose as the plug 65 in the first form of the invention; that is to say, it forms an adjustable stop for a rod 106 which has one end screwed into the carriage 81 in line with the plug, so that the forward and reduced end of the rod will engage against the left end of the plug.

The rod 106 slides freely through the slot 107 of the plate 108 which is bolted onto a portion of the sleeve 100. The sleeve is shown as provided with an enlarged end plate 109 which is also split like the sleeve and the plate 108 is bolted to the enlargement 109 by the screws 110 on one side of and adjacent to the split 101. There is a pin 111 anchored in the member 109 and on the opposite side of the split to the screws 110. There is a rocker shaft 112 having its bearing in an extended portion of the plate 108 and this rocker shaft is provided with an eccentric 113 which is adapted to act upon the pin 111 for the purpose of applying a squeezing action to the member 109 on opposite sides of the split 101 in order to cause a portion of the sleeve to grip the shaft 82 and temporarily hold the sleeve from moving lengthwise of the machine.

There is an arm 114 having one end passing through one end of the rocker shaft 112 and this arm reaches towards the back of the machine where it is connected with one end of the coiled spring 115, the other end of the spring being connected with a pin 116 which is mounted in an ear 117 formed on a sleeve 118 which is mounted to slide on the shaft 99 of the machine.

Preferably, there is a rod 119 disposed within the coiled spring 115 so that the arm 114 will be swung in a positive manner in the direction necessary to release the clamping action on the sleeve 100, whereas it is moved in the opposite direction resistibly through the spring 115 to apply the clamping pressure.

The device just described serves to lock the sleeve 100. There is an arm 120 extending from the enlargement 104 on the sleeve 100 and on the rear end of this arm there is formed a yoke 121 which straddles the shaft 99 and which has a slot 122 of arcuate shape, the arc of curvature of which is struck from the center of the shaft 96. This fork not only straddles the shaft 96 but it also engages in a circumferential groove 123 on one end of the sleeve 118. The purpose of this fork is to cause a longitudinal sliding movement of the sleeve 118 whenever the sleeve 100 moves lengthwise on the machine in order to keep the eccentric 113 and the pin 111 in co-operative relation during different positions of the sleeve 100. Whenever the lever arms 97 are rocked through the manipulation of the hand lever arm 98 for the purpose of moving the knife into and out of the fabric, they carry with them the shaft 93 on which the knife is mounted and

the shaft 99 and during this movement the sleeve 118 describes an arc corresponding with the arc of curvature of the slot 122 in the fork, so that the fork remains in operative engagement with the sleeve 118 as is indicated by the dotted line position in Figure 7.

Operation

The collar 124 which is adapted to be placed in various positions along the rod 106 and to be secured by the set screw 125 is fixed in some adjusted position on this rod corresponding with the width of the disc to be cut from the roll of fabric.

Assuming that a disc has been cut from the roll of fabric and the parts are in the position shown in Figures 8 and 9 with the knife in a retracted position, and the knife is in a plane which is to the right of the end of the roll of fabric on the shaft 83 a distance corresponding with the width of the disc to be cut from the roll; the operator may now press downwardly on the lever arm 98 and this will swing the arms 97 and the shaft 99 and it will also move the shaft 93 and the knife in the arc of a circle, the center of which is in the shaft 96. This will cause the knife to move into the roll of fabric and when the edge of the knife has entered the groove 92 it will cut a disc from the roll of fabric.

Soon after the knife starts to move forwardly in this cutting operation, the pin 116 pushes against one end of the bar 119 and this bar acts against the end of the lever arm 114 and rocks this lever arm counterclockwise in Figure 7 from the full line position to the dotted line position. The arm 114 being connected with the rocker shaft 112 it causes the latter to rock, and with it the eccentric 113. Before this movement takes place, the eccentric holds the pin 111 in such position that the sleeve 100 is clamped tight to the shaft 82.

Whenever the rocker shaft is oscillated in the manner described above, the eccentric 113 releases the pin 111 and this allows the split end of the sleeve 100 to expand to its normal position and this releases the grip of the sleeve upon the shaft 82. When this takes place the spring 102 moves the sleeve from right to left, as viewed in Figures 8 and 9, until the plug 105 strikes against the end of the rod 106 which is carried by the carriage. The sleeve 100 is now reset into the position shown in Figures 8 and 9.

When the handle 98 is lifted to return the knife to its inoperative position, or toward the rear of the machine, the following operations take place; that is to say, the pin 116 draws on the coiled spring 119 in a clockwise direction in Figure 7, thus swinging the lever arm 114 in a clockwise direction, and this rocks the shaft 112 and with it the eccentric 113 so that the latter presses on the pin 111 in a direction necessary to draw the end of the sleeve 100 lying on opposite sides of the split 101 towards each other to tighten the sleeve 100 on the shaft 82. After this action takes place the operator will turn the hand wheel 90 to move the chain 86 for the purpose of advancing the carriage from right to left in Figures 5 and 6. This movement of the carriage will be terminated automatically when the collar 124 on the rod 106 strikes against the plate 108 and the extent of this movement will correspond with the width of the discs to be cut. This will complete one cycle of operation.

The next time the handle 98 is depressed to move the knife into the fabric, the clutching

action of the sleeve 100 on the shaft 82 will be released in the manner described above and the sleeve will again slide from right to left in Figures 8 and 9 until the plug 105 engages against the end of the rod 106. Thus after each cutting operation the sleeve 100 is automatically reset and the plate 108 is moved along the rod 106 away from the collar 124 a distance corresponding with the width of the discs to be cut so that after the cutting operation is completed the operator may again reset the carriage and the resetting will correspond with the position of the plug 105. This plug is adjustable the same as in the first construction, in order to vary the stopping position of the sleeve 100 in accordance with the width of the disc to be cut.

The above operations may be repeated until the entire roll of fabric has been cut into discs. Each time the sleeve 100 moves along the shaft 82 the fork 121 causes the sleeve 118 to move a corresponding distance along the shaft 99 thereby maintaining the proper relation between this sleeve and the sleeve 100. While the machine shown in Figures 5 to 10 is different in construction from that first described, my present invention is modified in Figures 5 to 10 to correspond with the particular type of machine, but to accomplish the same result as is accomplished in the first of "Judelshon" type of machine. In the "Adams" type, the machine shown in Figures 5 to 10, the carriage 81 which moves the fabric chuck 85 along the shaft 83 is so operated as to control the position of the fabric in relation to the cutting knife, whereas in the "Judelshon" type of machine the carriage on which the knife is mounted is adjusted step by step to move the knife in relation to the fabric as the latter does not shift lengthwise of the machine.

It will be apparent that my present invention makes it unnecessary for the operator to measure the position of the knife in relation to the fabric for each cutting operation and that the measuring is performed automatically except for the operation of the hand wheel 22 in one case and the hand wheel 90 in the "Adams" machine. While I have described two embodiments of my invention I desire to include within the scope of my invention all modifications coming within the scope of the following claims. My invention may be applied to other types of machines where cutting operations are to be performed upon a body of material at regular and predetermined distances apart.

Having described my invention, what I claim is:

1. The combination of a machine for cutting a roll of material into separate discs wherein a revolvable knife is movable towards and from the roll, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, and a stop device for controlling the positioning of the carriage, including a stop member, means for locking it stationary and releasing it for movement lengthwise of the machine, said stop member having a limited movement lengthwise of the machine and engaging members on said carriage to limit the movement of said stop member, a spring arranged to move said stop member in one direction when released, means for locking and unlocking the stop member, and means for moving the carriage lengthwise of the machine.

2. The combination of a machine for cutting a roll of material into separate discs wherein a revolvable knife is movable towards and from

the roll, and having means for moving the knife to cut the material and to disengage it therefrom, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and the roll of material and a stop device for controlling the positioning of the carriage, including a stop member, said stop member engaging members on said carriage to limit the movement of said stop member, a spring arranged to move said stop member in one direction when released, and means for locking and unlocking the stop member and adapted to be actuated by said knife controlling means so that said stop member is unlocked when the knife is moved into the fabric, and means for moving the carriage lengthwise of the machine.

3. The combination of a machine for cutting a roll of material into separate discs wherein a revolvable knife is movable towards and from the roll, and having means for moving the knife to cut the material and to disengage it therefrom, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and the roll of material and a stop device for controlling the positioning of the carriage, including a stop member, said stop member engaging members on said carriage to limit the movement of said stop member, a spring arranged to move said stop member in one direction when released, and means for locking and unlocking the stop member and adapted to be actuated by said knife controlling means so that said stop member is unlocked when the knife is moved into the fabric, means for moving the carriage lengthwise of the machine, and means actuated simultaneously with said knife controlling means for locking said carriage against movement while the knife is moving into and out of the roll and the carriage is released for movement by its operating means while the knife is retracted from the roll.

4. The combination of a machine for cutting a roll of material into separate discs wherein a revolvable knife is movable towards and from the roll, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member movable lengthwise of the machine and means for locking the same in different positions in its movements, said stop member co-operating with portions of the carriage in such manner that the stop member and carriage may move lengthwise of the machine in relation to each other, means for holding the carriage at various positions in its longitudinal movement, means for moving the carriage longitudinally of the machine when released and while the stop member is stationary, a spring operating to move said stop member in one direction, means for releasing the stop member for movement by said spring while the carriage is stationary, to bring about a predetermined movement of the stop member.

5. The combination of a machine for cutting a roll of material into separate discs wherein a revolvable knife is movable towards and from the roll, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of fabric, a stop member movable lengthwise of the machine and means for locking the same in different positions in its movements, adjustable means on said carriage for permitting relative movement longitudinally of the machine as between

said stop member and said carriage, means for moving the carriage longitudinally of the machine while the stop member is stationary, a spring operating to move said stop member in one direction and means for releasing the stop member for movement by said spring while the carriage is stationary, to bring about a predetermined movement of the stop member.

6. The combination of a machine for cutting a roll of material into separate discs wherein a revolvable knife is movable towards and from the roll, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member movable lengthwise of the machine, said stop member and carriage co-operating to permit relative movement as between said carriage and said stop member, of a predetermined extent, a spring for urging said stop member in one direction, means for moving the carriage lengthwise of the machine and means for holding the stop member while the carriage is moving, and means for releasing the stop member from movement by said spring while the carriage is stationary whereby said stop member effects a step by step movement of said carriage along the machine.

7. The combination of a machine for cutting a roll of material into separate discs, wherein a revolvable knife is movable towards and from the roll, said machine having a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member movable lengthwise of the machine, a spring for moving said stop member in one direction and means for locking the stop member in different positions, said stop member co-operating with portions of said carriage in such manner that the stop member and carriage may move lengthwise of the machine in relation to each other and so that said stop member may be stopped by said carriage in one direction and whereby said carriage may be stopped by the stop member in one direction, means for causing the carriage to move longitudinally of the machine while the stop member is stationary, and means for releasing the stop member for movement by said spring while the carriage is stationary.

8. In a machine for cutting a roll of material into separate discs wherein a revolvable knife is moved towards and from the roll, a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member, a longitudinal member for guiding the movement of said stop member lengthwise of the machine, means for periodically causing said stop member to be locked to said guiding means and to be released therefrom, said stop member and said carriage co-operating with each other in such manner that the carriage and stop member may move in relation to each other and so that the stop member will be stopped by the carriage and the carriage by the stop member, a spring for moving said stop member in one direction, and means for moving said carriage.

9. In a machine for cutting a roll of material into separate discs wherein a revolvable knife is moved towards and from the roll, a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member, a longitudinal member for guiding the movement of said stop member lengthwise of the machine, means for periodically causing said stop member to be locked with said guiding means and to be released therefrom,

means for moving the knife into and out of the material and adapted to effect the operation of said stop member locking means, said stop member and said carriage co-operating with each other in such manner that the carriage and stop member may move longitudinally of the machine in relation to each other and so that the stop member will be stopped by the carriage and the carriage by the stop member, a spring for moving said stop member in one direction, means for moving said carriage and means for periodically locking and unlocking said carriage and actuated by said means for throwing said knife into and out of operation.

10. In a machine for cutting a roll of material into separate discs wherein a revolvable knife is moved towards and from the roll, a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member, a longitudinal member for guiding the movement of said stop member lengthwise of the machine, means for periodically causing said stop member to be locked with said guiding means and to be released therefrom, means for moving the knife into and out of the material and adapted to effect the operation of said stop member locking means, said stop member and said carriage co-operating with each other in such manner that the carriage and stop member may move longitudinally of the machine in relation to each other and so that the stop member will be stopped by the carriage and the carriage by the stop member, a spring for moving said stop member in one direction, means for moving said carriage and means for periodically locking and unlocking said carriage and actuated by said means for throwing said knife into and out of operation, and means placing a drag on said carriage to avoid unintentional movement thereof while the same is unlocked.

11. In a machine for cutting a roll of material into separate discs wherein a revolvable knife is moved towards and from the roll, manual means for moving the knife into the roll of material and withdrawing it therefrom, a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member, a longitudinal member for guiding the movement of said stop member lengthwise of the machine, means operated by said manual means for causing said stop member to be locked with said guiding means when the knife is in retracted position and to be released when the knife is moved into the fabric, said stop member and said carriage co-operating with each other in such manner that the carriage and stop member may move longitudinally of the machine in relation to each other and so that the stop member will be stopped by the carriage and the carriage by the stop member, a spring for moving said stop member in one direction and means for moving said carriage.

12. In a machine for cutting a roll of material into separate discs wherein a revolvable knife is moved towards and from the roll, manual means for moving the knife into and retracting it from the roll of material, a carriage movable lengthwise of the machine to bring about a step by step positioning of the knife and roll of material, a stop member, a longitudinal member for guiding the movement of said stop member lengthwise of the machine, a telescoping casing, one portion of which is secured to said carriage and the other portion to said stop member, and a coiled spring

in said telescoping casing for urging the stop member in one direction lengthwise of the machine, said stop member and said carriage cooperating with each other in such manner that
5 the carriage and stop member may move longitudinally of the machine in relation to each other and so that the stop member will be stopped by the carriage and the carriage by the stop member, adjustable means on the carriage for regulating the movement of the stop member in rela-

tion to the carriage, means actuated by said manual means for releasing said stop member when the knife is moved into the fabric and for locking said stop member when the knife is retracted from the material, means for locking said carriage when
5 operated by said manual means so that the carriage is locked when the knife is moved into the material and is released when the knife is moved out of the material.

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