Oct. 16, 1934. F. B. CARLAND ET AL 1,976,834

CUTTING TABLE MECHANISM

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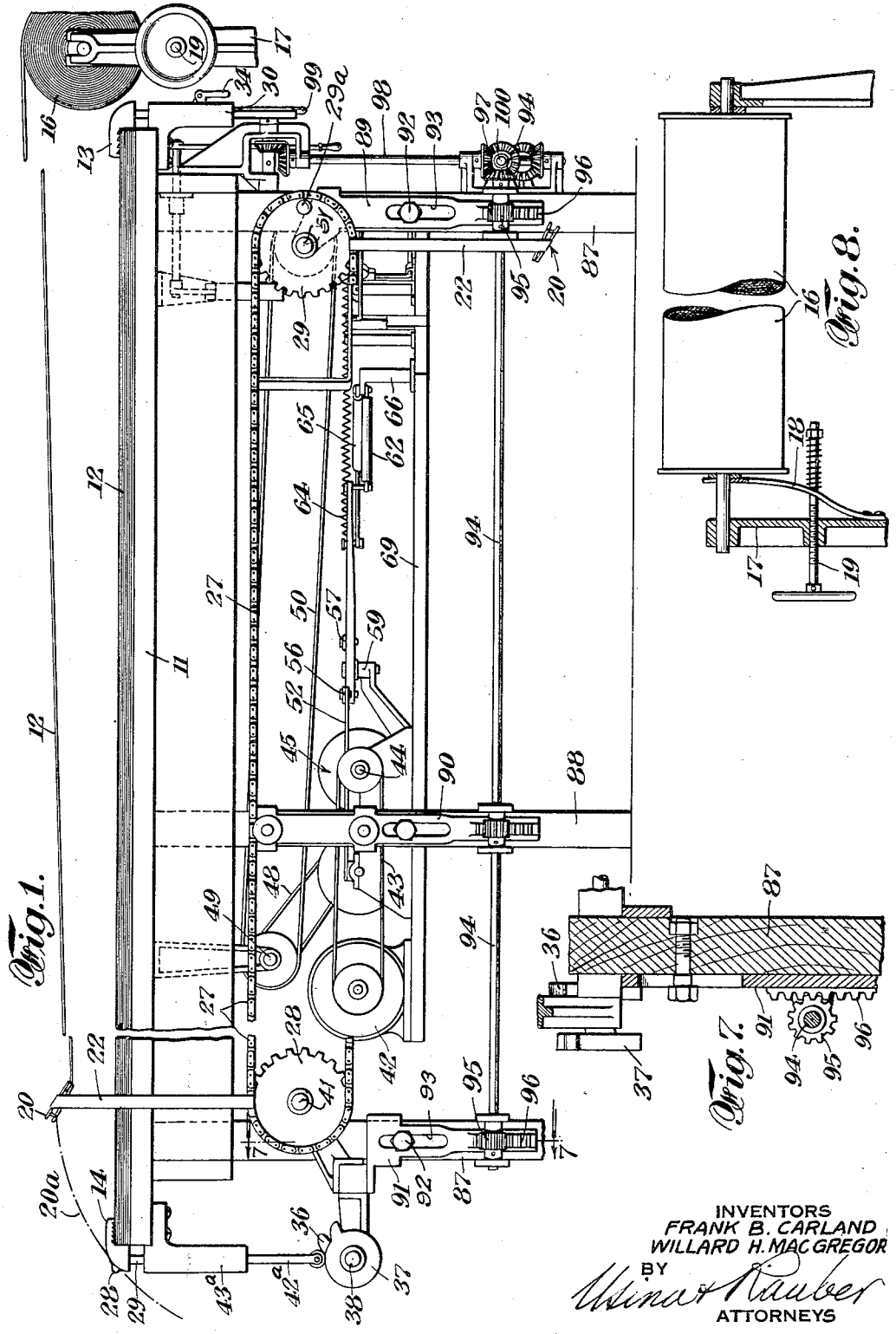


Fig. 1.

Fig. 8.

Fig. 7.

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CUTTING TABLE MECHANISM

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Fig. 2.

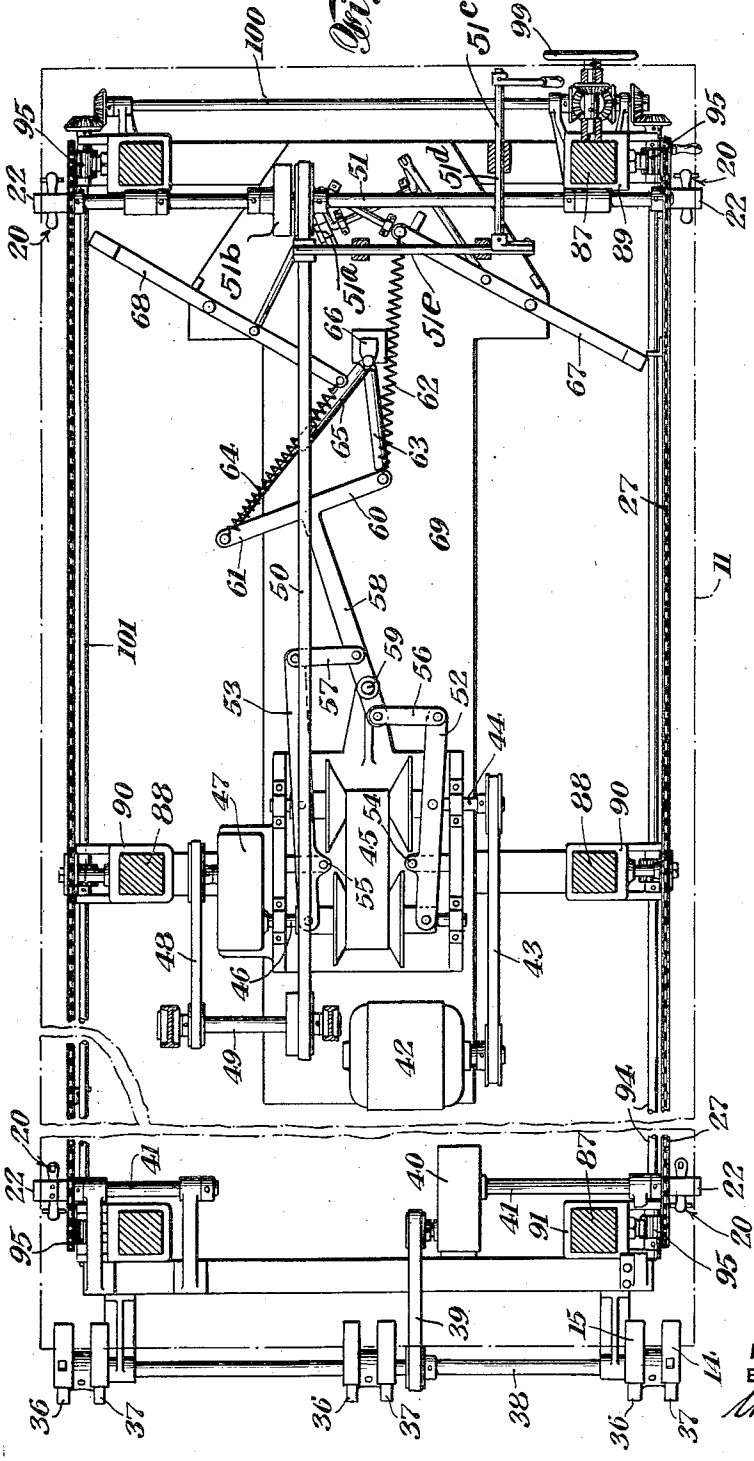


Fig. 10.

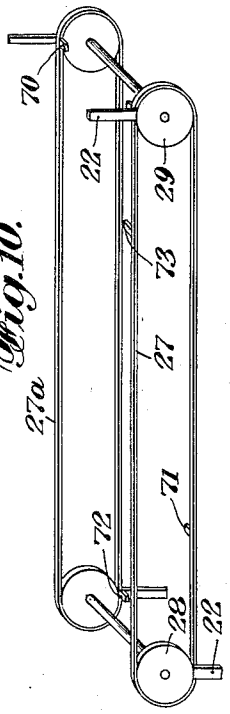
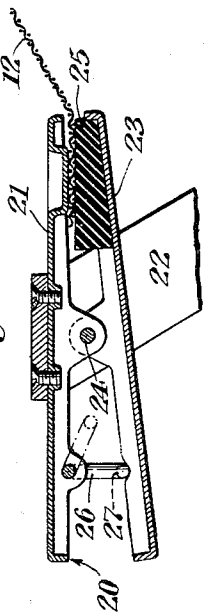


Fig. 9.



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CUTTING TABLE MECHANISM

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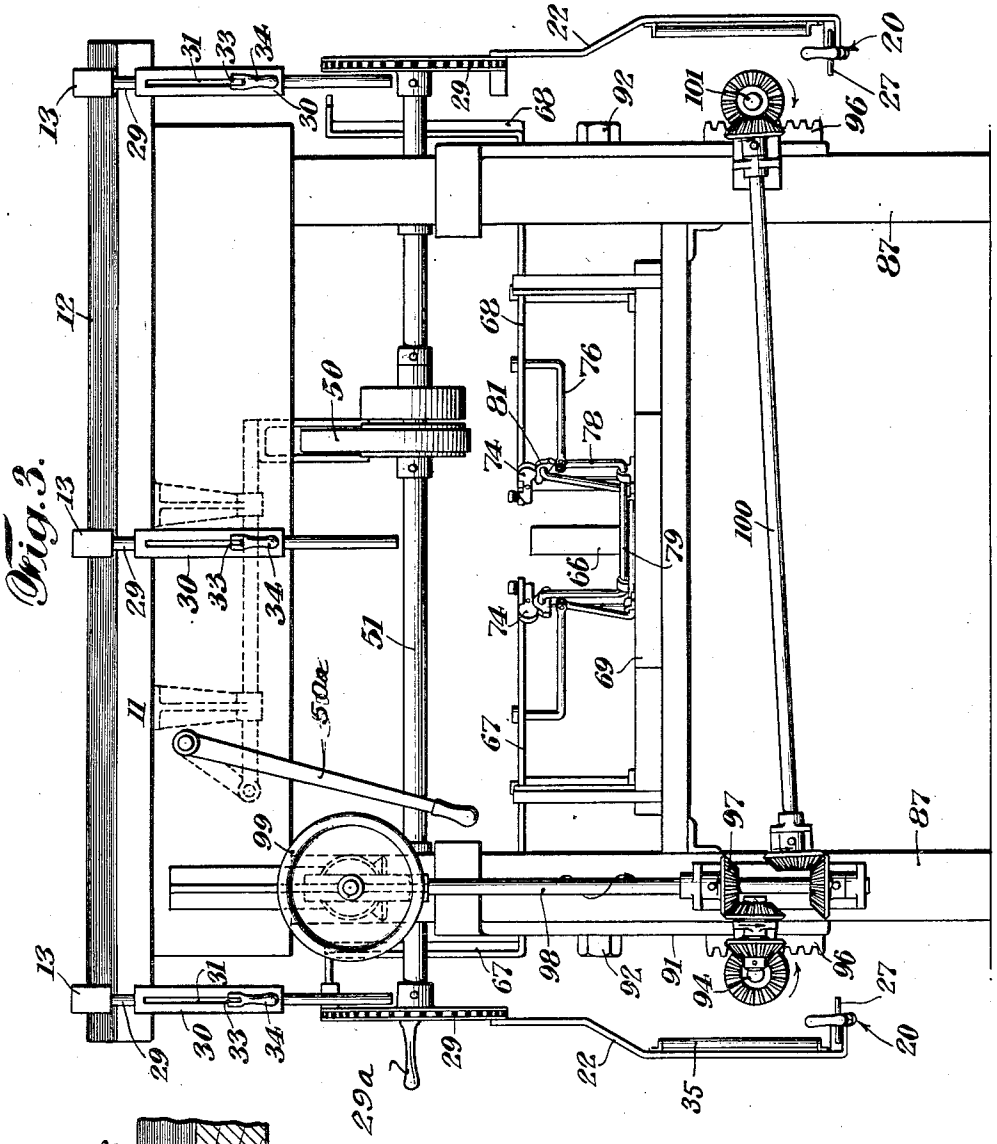


Fig. 3.

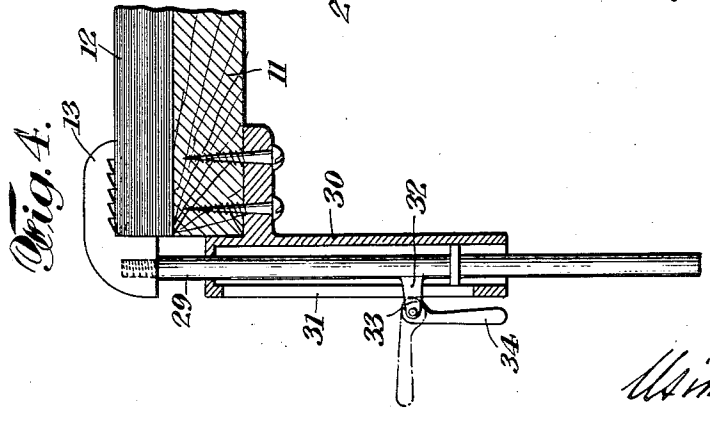


Fig. 4.

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CUTTING TABLE MECHANISM

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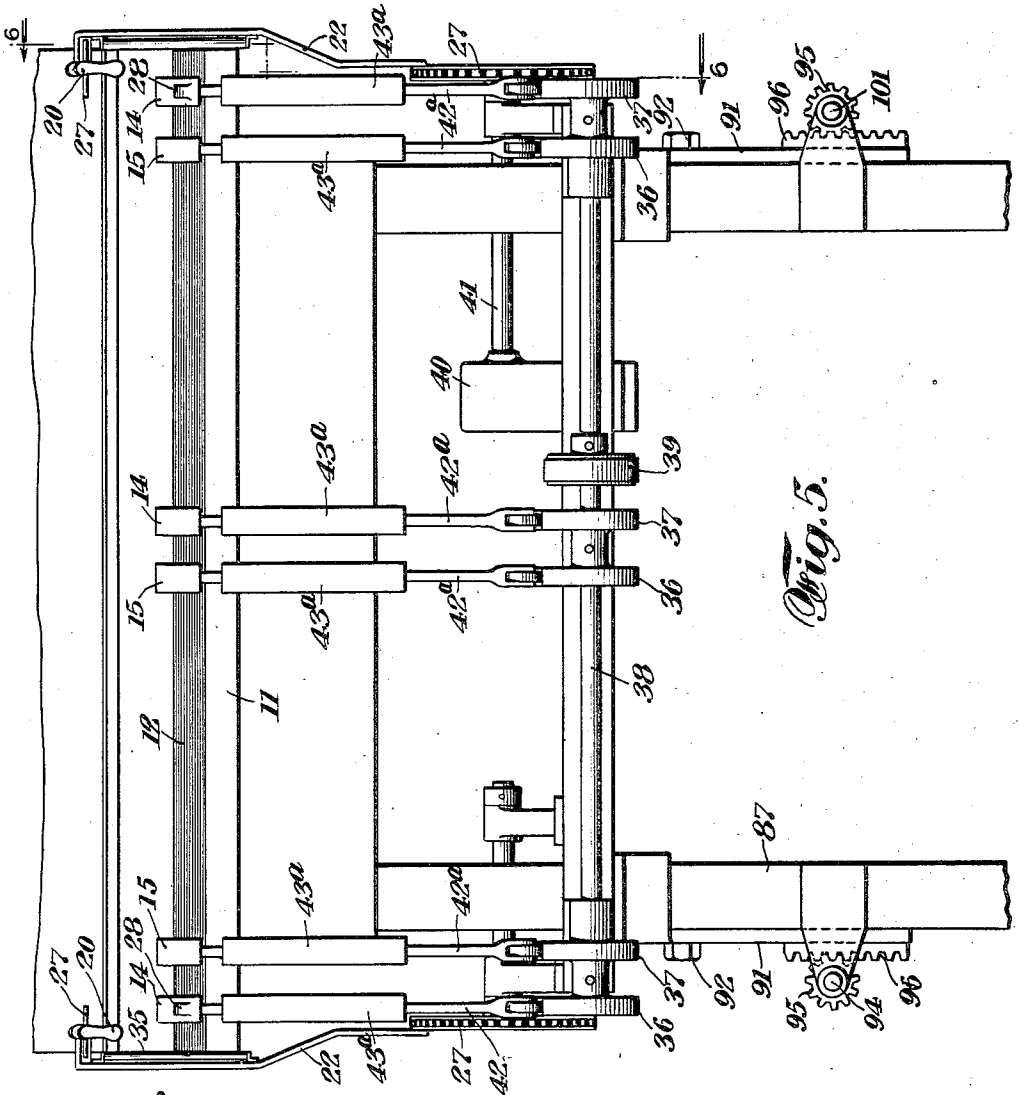


Fig. 5.

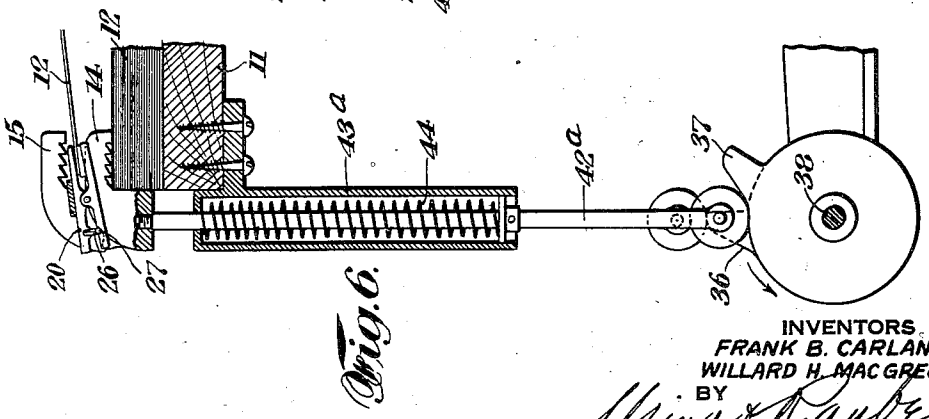


Fig. 6.

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Fig. 13.

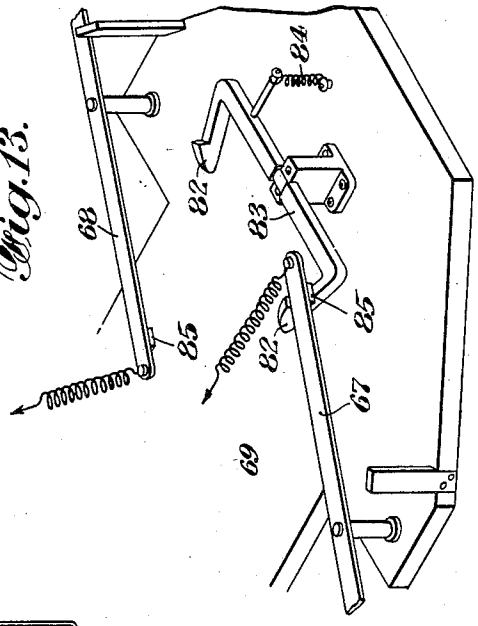


Fig. 14.

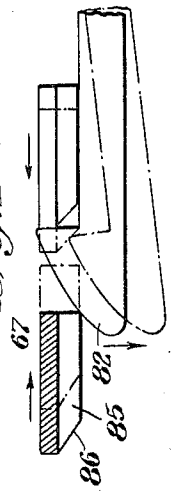


Fig. 11.

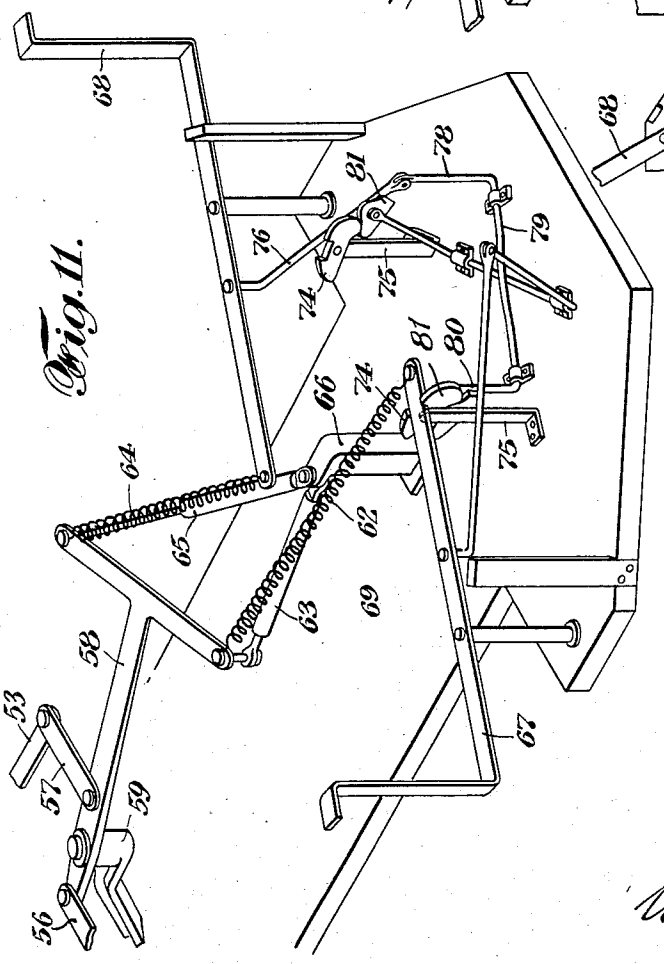
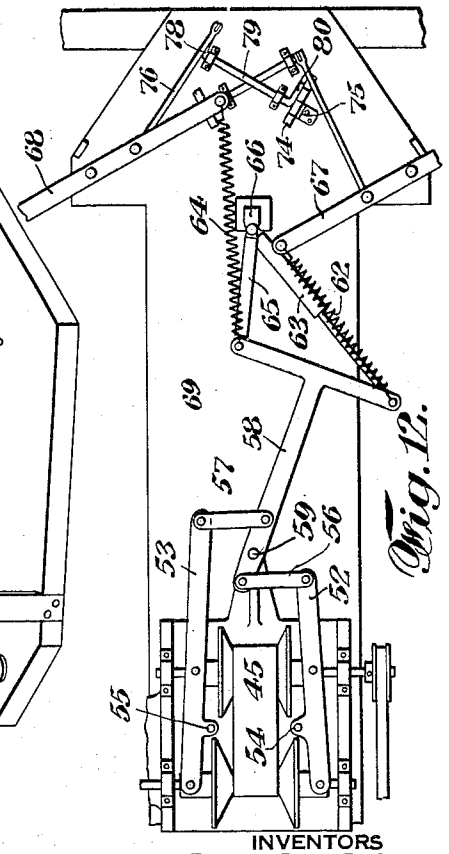


Fig. 12.



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UNITED STATES PATENT OFFICE

1,976,834

CUTTING TABLE MECHANISM

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Application August 23, 1932, Serial No. 630,022

8 Claims. (Cl. 271—2.5)

In cutting out garments the fabric is laid in a number of sheets on a table with a pattern sheet on top of the pile, then all the layers are cut at the same time. For economy, the top is made of considerable length. The fabric is carried in a roll at one end. The operator draws out the fabric from the roll down the length of the table, severs it at the roll end of the table and repeats the operation until he has the desired number of layers. The present invention provides a mechanism for laying the fabric rapidly, saving time and labor and permitting the use of very long tables. The drawings illustrate embodiments of the invention.

Fig. 1 is a side elevation of the table and mechanism with several layers on the table and another one drawn out from the roll and nearly in position to be laid on the table;

Fig. 2 is a horizontal section on a plane just below the table top;

Fig. 3 is an elevation of the roll end of the table;

Fig. 4 is a vertical section illustrating one of the clamps at the roll end;

Fig. 5 is an elevation of the head end, i. e., the end remote from the roll;

Fig. 6 is a vertical section showing in elevation the clamps at this end of the table;

Fig. 7 is a vertical section on the line 7—7 of Fig. 1;

Fig. 8 is a vertical section illustrating the brake on the roll;

Fig. 9 is a vertical section of one of the clips by which the fabric is drawn out from the roll;

Fig. 10 is a perspective view illustrating separately the driving mechanism for the clips;

Fig. 11 is a perspective view and Fig. 12 a plan of the change speed controlling device;

Fig. 13 is an alternative arrangement of the same and Fig. 14 a detail thereof.

The table 11 is of any desirable length and of a width corresponding to the material to be cut. The material is laid on the table in layers 12, the pile being clamped down by means of clamps 13 at the roll end and clamps 14 and 15 arranged in pairs at the head end. It is drawn out from a roll 16 carried in standards 17 just beyond the end of the table. A spring 18 (Fig. 8) presses against the end of the spool on which the roll of fabric is carried so as to stop it promptly when the pull on the fabric stops. An adjusting screw 19 serves to regulate the pressure of the spring and the braking effect. As each length of fabric is drawn off the roll to the head end of the table, the fabric is cut or torn across along a thread substantially parallel with the roll end of the table, the layer of fabric is dropped on to the table and clamped, and the end of the fabric on the roll is again seized and run out on to the table. The clips 20 for seizing the fabric are of the type illustrated in Fig. 9. Each clip has an upper jaw 21 mounted fixedly on a standard 22 and a lower jaw 23 mounted on a pivot pin 24 carried by the fixed jaw. A pad 25 of felt or the like grips the end of the layer 12 of fabric against the upper jaw. A bail 26 pivoted in the upper jaw fits in a recess in the lower jaw so as to separate the tails of the two jaws and grip the fabric firmly at the front end. At each side of the machine there are two clips connected by their standards 22 to an endless sprocket chain 27 carried by sprocket wheels 28 and 29, the latter driven continuously as hereinafter described. The two standards are set at equidistant intervals along the chain so that while one is elevated to grip the fabric and draw it toward the head of the table the other is traveling from the head toward the roll end.

Near the end of a laying operation, the parts are moving slowly or may be stopped entirely. As the clips at the roll end rise, the operator inserts the torn or cut end of the roll of fabric into the clips near each edge and restores the locking bail so as to fasten the clip firmly to the fabric. The continued movement of the clips draws the fabric over the table in about the position shown in Fig. 1.

As the clips reach the end of the table they are unlocked and their continued movement pulls them free of the fabric. Each clip is inclined on its standard 22. At the end of its travel it swings through an arc 20*a*, Fig. 1. The bails 26 have laterally projecting ends 27 which, as shown in Fig. 5, are in line with the projections 28 on the end clamps. As the clips move through the arc 20*a*, these projections 28 throw the bail forward to the releasing position and the clips escape from the fabric. The clip supporting arms 22 are shaped to press in toward the table and are preferably provided with antifriction rollers 35 which bear against the sides the table and guide the clips in a steady parrallel movement.

The clamps 13 at the roll end of the table are operated manually, (though they may be automatic if preferred). Each clamp is mounted on a rod 29 carried in a guide 30 on the end of the table which has a slot 31 which receives an arm 32 on the rod. This arm carries a pivoted cam 33 which is manually operated. When the end of a layer is cut the operator lifts the arm 34, relcasing the cam and lifting the clamp, lays the end of the fabric in position and then pushes the clamp or allows it to drop by its weight on to the fabric and presses the arm 34 dawn to be clamped. Three such clamps, as shown in Fig. 3, will generally be sufficient at this end of the table, though the multiple arrangement and the automatic mechanism used at the head end may be used at the roll end also.

The clamps 14, 15 at the head end are in pairs. When the end of the fabric falls on to the pile the clamps are opened and closed automatically. Three of the clamps, numbered 15, are raised so that the edge of the fabric 12 passes under them and are then lowered and held down while the other three are raised and lowered. It is important to hold down the pile previously laid by three of the clamps while laying the edge of the next layer. The projection of the clamps is so slight that the opening of the second set does not materially disturb the fabric, the latter yielding sufficiently for the described operation.

This alternate operation of the two sets of clamps at the head end is effected by means of cams 36 and 37 carried on a shaft 38 (Fig. 2) driven by a belt 39 through gearing 40 which is driven by the shaft 41 of one of the sprockets 28 at the head end of the table. Each of the cams engages a roller on the end of a rod 42*a* which is guided in a tube 43*a* mounted on the head end of the table and carrying the clamp at its upper end. A spring 44 presses the clamps down against the circular part of the cams. The reduction gearing is made to bring the cams into operating position just before and just after the arrival of the end of a layer of fabric at the head of the table.

The mechanism is driven from a motor 42 (Fig. 2) which through a belt 43 actuates the driving shaft 44 of a variable speed gearing adapted to gradually increase and diminish the speed between wide limits. This may be, for example, a common type of Reeves variable speed gearing indicated as a whole and illustrated diagrammatically. On the shaft 44 there is a double cone pulley actuating a belt 45 which runs on double cone pulley carried on the driven shaft 46. The shifting of the cone pulleys on the driving and driven shafts effects the desired change of speed. The driven shaft through a reduction gearing 47 drives the belt 48 which drives the short cross shaft 49 which drives a belt 50 which extends to tight pulley 51*a* or to loose pulley 51*b* on the shaft 51 which carries the two sprockets at the roll end of the machine. The belt is shifted to the tight pulley or to the loose pulley, as desired, by the lever 51*c* on the shaft 51*d* which actuates the belt-shifting rod 51*e*.

The speed changing gear is operated by levers 52 and 53 at opposite sides, pivoted to the frame of the mechanism at 54 and 55 respectively and engaging collars on the shafts of the gearing by which the two halves of each cone are pressed together or pulled apart so as to increase or decrease the effective diameter with which the connecting belt is engaged. When the ends of the levers 52 and 53 are spread apart as in Fig. 2 the cones on the driving shaft 44 of the mechanism are operating at their minimum diameter and the cones on the driven shaft at their maximum diameter so that the resultant speed is at its slowest, the motor being assumed to operate at substantially constant speed. When the levers 52 and 53 are drawn together, the highest resulting velocity will be obtained. The levers 52 and 53 are connected by links 56 and 57 to a lever 58 pivoted at the fixed point 59 and having arms 60 and 61. The arm 60 is actuated through a spring 62, its movement being retracted by a dash-pot 65, the two dash pots being pivotally supported on a bracket 66. The spring 62 is connected at its other end to a lever 67, and the spring 64 to a lever 68. These levers are pivoted on a platform 69 on which all the driving mechanism thus far described is carried. The ends of the levers project outward into the paths of tripping arms mounted on the sprocket chains 27.

In the position of Fig. 2, the chains are traveling at slow speed just before the completion of one laying operation. The chain 27*a* (Fig. 10) at the far side of the machine has a trip 70 projecting inward in line with the end of the lever 68. As the chain moves this lever will be shifted from the position of Fig. 2 to that of Fig. 12. The spring 64 will be put under tension sufficiently to pull the lever 58 around to the high speed position. The movement will be slow because of the dash-pot 65. Also the opposite spring 62 will resist the operation. At the end of the movement of lever 68, however, the opposite lever 67 which was locked in the position shown in Fig. 2 will be released and it will yield to the pull of its spring and move to the retracted position of Fig. 12. Thus the lever 58 will be gradually, but not too slowly, shifted to bring the speed up to the maximum. Near the end of the laying operation a lug 71 on the near chain 27 will strike the projecting end of the lever 67 and move it from the position of Fig. 12 to that of Fig. 2, which movement will result in a gradual reduction to low speed just at the proper moment for disengaging the clips from the end of the fabric and preventing overrun of the latter. This slow speed will continue, to give the operator time for fastening the clips to a new end of the fabric, after which the lug 72 on the far chain 27*a* will again operate the gearing to reduce the speed; the slow speed continuing until the lug 73 comes into position and restores the high speed.

Each time that the lever 67 or 68 is moved forward its inner end is locked until the opposite lever is turned forward. See Fig. 11. The lock is a weighted latch 74 pivoted on a standard 75. The inner end of the lever snaps over the end of the latch. Now when the lever 68 is actuated a link 76 carried thereby pushes an arm 78 on a shaft 79 mounted on the platform 69 and rocks an arm 80 which carries at its upper end a cam 81 which lifts the tail end of the latch 74 and releases the lever.

A simpler mechanism serving the same purpose is illustrated in Figs. 13 and 14. The levers 67 and 68 engage and ride over latches 82 on the ends of a rocking rod 83, the hook ends being yieldingly held upward by a spring 84. The arm 67 being latched, the rearward movement of the arm 68 will cause it to strike its latch 82, rocking the rod 83 downward and releasing the arm 67. As shown in Fig. 14 the levers may carry blocks 85 on their under faces for engagement with the latch 82, the blocks having inclined faces 86 to facilitate the release of the lever when the latch is first pressed down by the opposite lever.

As the pile of sheets increase in thickness it may be advisable to elevate the path of the clips which carry a new length of fabric over the pile. The platform 69 is arranged to carry all of the mechanism except the end clamps and is adjustable from time to time. The table itself is mounted on corner posts 87 and has as many intermediate posts 88 as its length justifies. The outer bearings of the shafts 41 and 51 are mounted on brackets 89, 90, 91 which slide on the posts and are clamped in position by bolts 92 passing into the posts through slots 93. It is

advisable to raise all these supports at one operation. For this purpose a shaft 94 on the near side extends along the machine, carries pinions 95 engaging racks 96 on the several brackets. At its front end it is engaged through intermediate gears with a beveled gear 97 on a vertical shaft 98 which at its upper end is operated through intermediate gearing and a hand wheel 99. The shaft 98 through intermediate gearing also drives a shaft 100 extending across the roll end of the table which in turn drives a shaft 101 at the far side which actuates the corresponding brackets on the posts on that side.

The vertical adjustment of the clips 20 and clamps 13, 14 and 15 may be effected in various other ways than by lifting the entire mechanism above described. Hand clamps or automatic clamps may be used along the sides of the table in cases where it is desirable; and the particular clamp described may be used with various other schemes for laying the pile lengths of the fabric on the table.

The sprocket 29 is preferably provided with a handle 29*a* by means of which the clip carrying chains can be manually driven at which time the drive belt 50 will be shifted to the loose pulley of the tight and loose pulley on the shaft 51. A suitable belt shifter 50*a* is provided as shown in Fig. 3. It is also contemplated in some cases that the clip carrying sprocket chains may be manually driven thus dispensing with the power drive and its associated speed change mechanism.

Instead of manually operating the wheel 99 and the gearing operatively associated therewith it is contemplated that a ratchet mechanism may be provided for automatically effecting the vertical adjustment of the clips and their supporting mechanism as the pile of material laid up accumulates on the table.

Various other modifications may be made by those skilled in the art without departing from the invention as defined in the following claims:

What we claim is:

1. In combination with a fabric cutting table and means for carrying a roll of fabric at one end of the table, mechanism for laying the fabric on the table including clips for seizing the fabric, means for moving said clips along the table to lay the fabric over the length of the table and means for reducing the speed of movement of the clips at the begininng of each laying operation.

2. In combination with a fabric cutting table and means for carrying a roll of fabric at one end of the table, mechanism for laying the fabric on the table including clips for seizing the fabric, means for moving said clips along the table to lay the fabric over the length of the table and means for reducing the speed of movement of the clips at the beginning and at the end of each laying operation.

3. In combination with a fabric cutting table and means for carrying a roll of fabric at one end of the table, mechanism for laying the fabric on the table in successive layers and clamps for holding the pile on the table, said clamps being in pairs and means for operating the clamps of each pair alternatively so that one will retain the pile already on the table while the other is clamping the next layer.

4. In combination with a fabric cutting table, mechanism for laying thereon a pile of layers of fabric, all with the same face upward, said mechanism including means for carrying a roll of fabric at one end of the table, devices for seizing a free end of the fabric near the end of the roll, means for moving said devices forward and back along the table, means for opening them near the far end of the pile to release the fabric while they move back empty to the starting point and clamps carried by the table near the far end of the pile adapted to hold the pile down while the seizing devices move backward and seize and draw another layer of the fabric over the pile.

5. In combination with a fabric cutting table, mechanism for laying thereon a pile of layers of fabric, all with the same face upward, said mechanism including means for carrying a roll of fabric at one end of the table, devices for seizing a free end of the fabric near the end of the roll, means for moving said devices with an uninterrupted movement forward and then back along the table, means for opening them near the far end of the pile to release the fabric while they move back empty to the starting point and clamps carried by the table near the far end of the pile adapted to hold the pile down while the seizing devices move backward and seize and draw another layer of the fabric over the pile.

6. In combination with a fabric cutting table, mechanism for laying thereon a pile of layers of fabric, all with the same face upward, said mechanism including means for carrying a roll of fabric at one end of the table, devices for seizing a free end of the fabric near the end of the roll, means for moving said devices forward and back along the table, means for opening them near the far end of the pile to release the fabric while they move back empty to the starting point and clamps carried by the table near the opposite ends of the pile and adapted to hold the pile down while the seizing devices move backward and seize and draw another layer of the fabric over the pile.

7. In combination with a fabric cutting table, mechanism for laying thereon a pile of layers of fabric, all with the same face upward, said mechanism including means for carrying a roll of fabric at one end of the table, devices for seizing a free end of the fabric near the end of the roll, means for moving said devices forward and back along the table, means for opening them near the far end of the pile to release the fabric while they move back empty to the starting point, manually operated clamps near the roll end of the pile and automatic clamps near the far end of the pile adapted to hold the pile down while the seizing devices move backward and seize and draw another layer of the fabric over the pile.

8. The apparatus of claim 4, the seizing devices engaging the fabric at its opposite edges, leaving the central portion of the fabric free, and the clamps being in position to engage the central portion of the fabric.

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