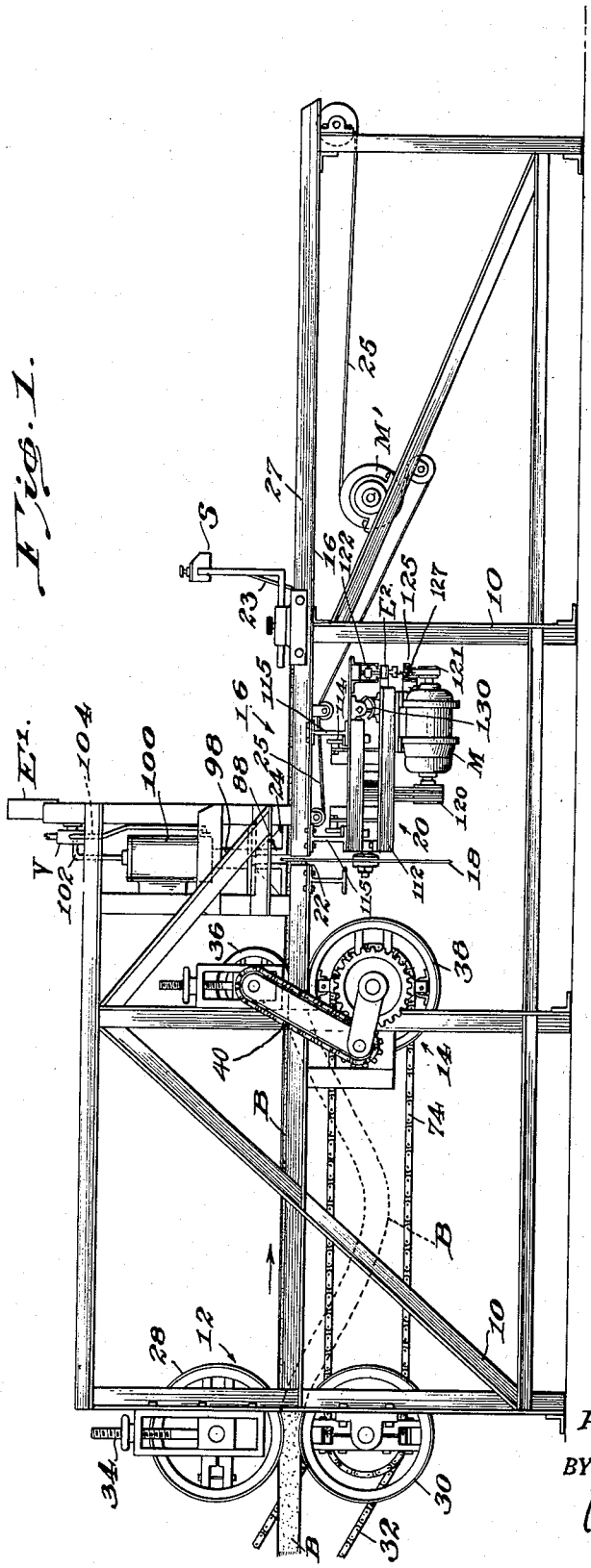
Feb. 10, 1942. P. F. LOCKETT ET AL 2,272,215

AUTOMATIC CUTOFF DEVICE

Filed Dec. 4, 1939 5 Sheets-Sheet 1

Fig. 1.



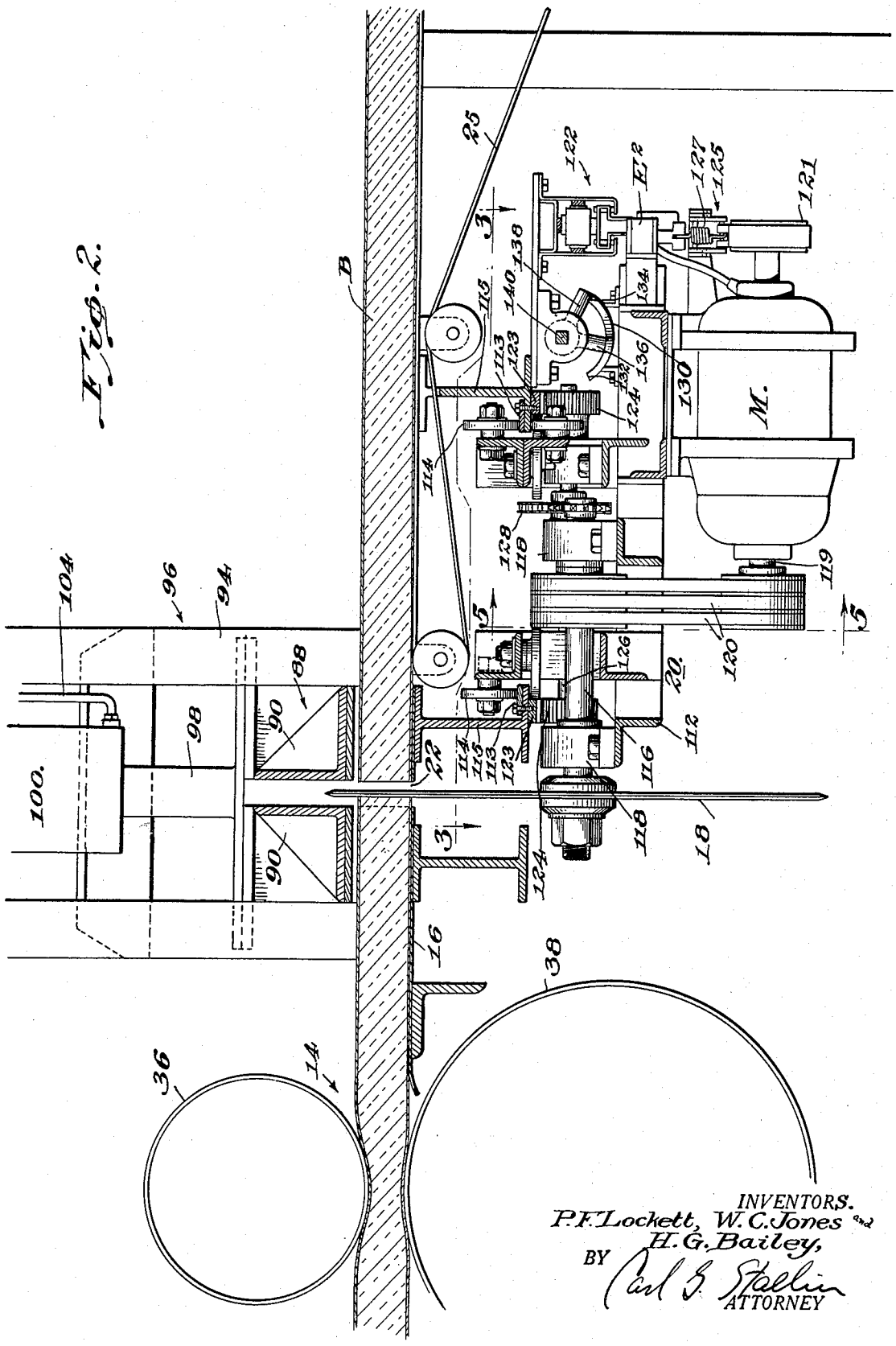
INVENTORS.
P. F. Lockett, W. C. Jones
H. G. Bailey,
BY Carl G. Stallman
ATTORNEY

Feb. 10, 1942. P. F. LOCKETT ET AL 2,272,215

AUTOMATIC CUTOFF DEVICE

Filed Dec. 4, 1939 5 Sheets-Sheet 2

Fig. 2.



INVENTORS.
P. F. Lockett, W. C. Jones and
H. G. Bailey,
BY Carl B. Stallin
ATTORNEY

Feb. 10, 1942. P. F. LOCKETT ET AL 2,272,215

AUTOMATIC CUTOFF DEVICE

Filed Dec. 4, 1939 5 Sheets-Sheet 3

Fig. 4.

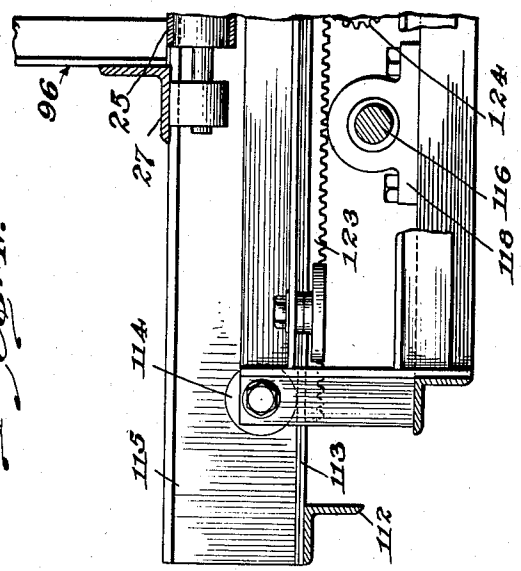
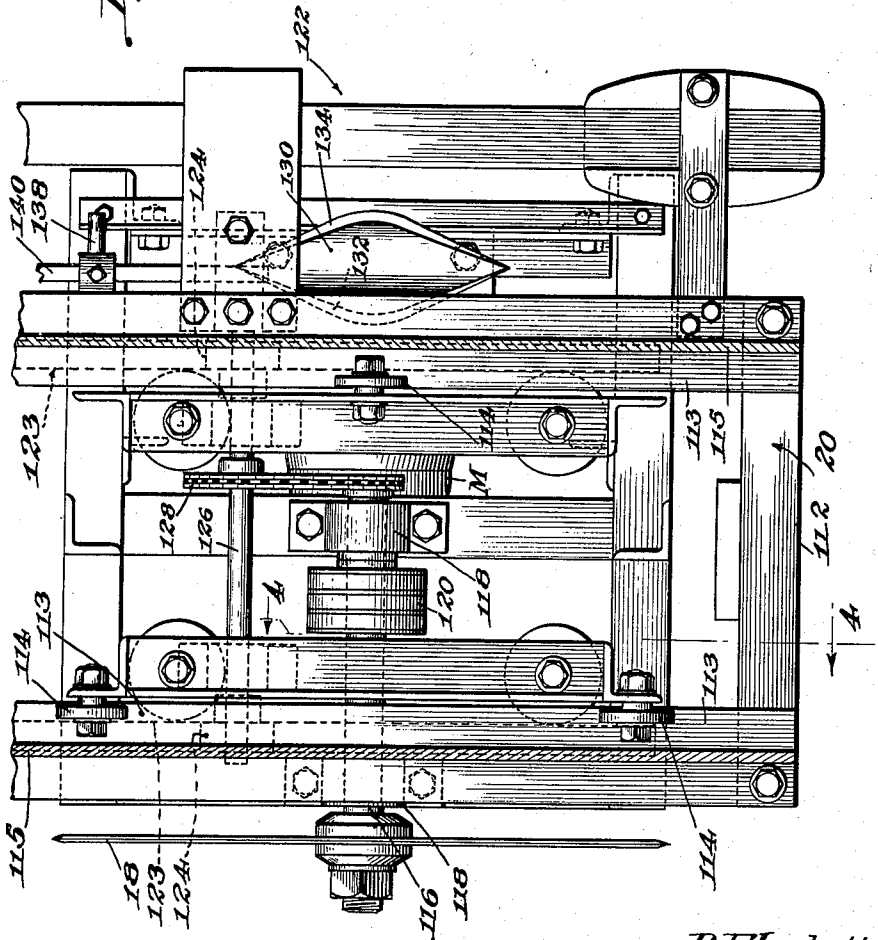


Fig. 3.



INVENTORS
P. F. Lockett, W. C. Jones and H. G. Bailey
BY Carl B. Stalin
ATTORNEY

Feb. 10, 1942. P. F. LOCKETT ET AL 2,272,215

AUTOMATIC CUTOFF DEVICE

Filed Dec. 4, 1939 5 Sheets-Sheet 4

Fig. 5.

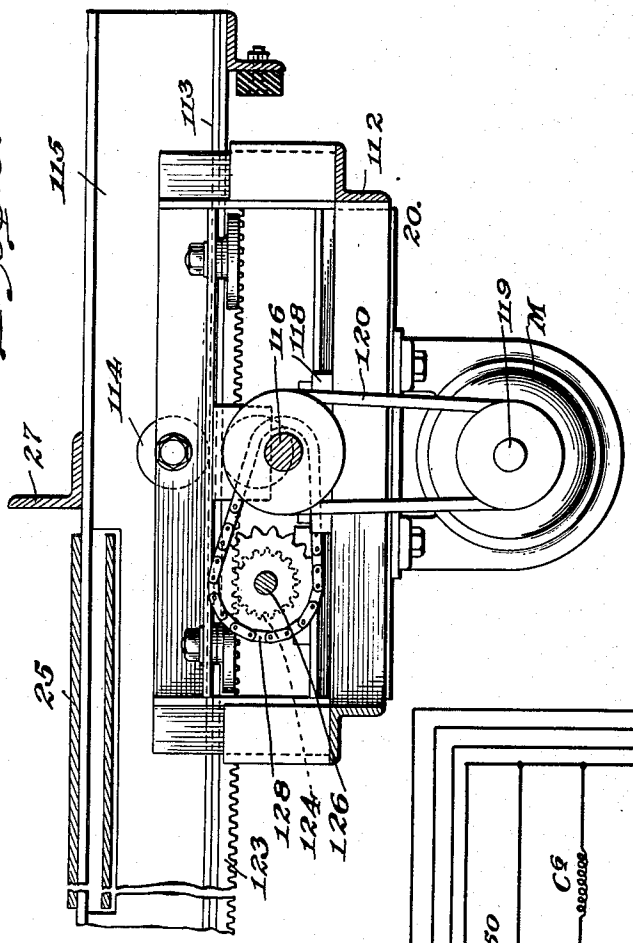
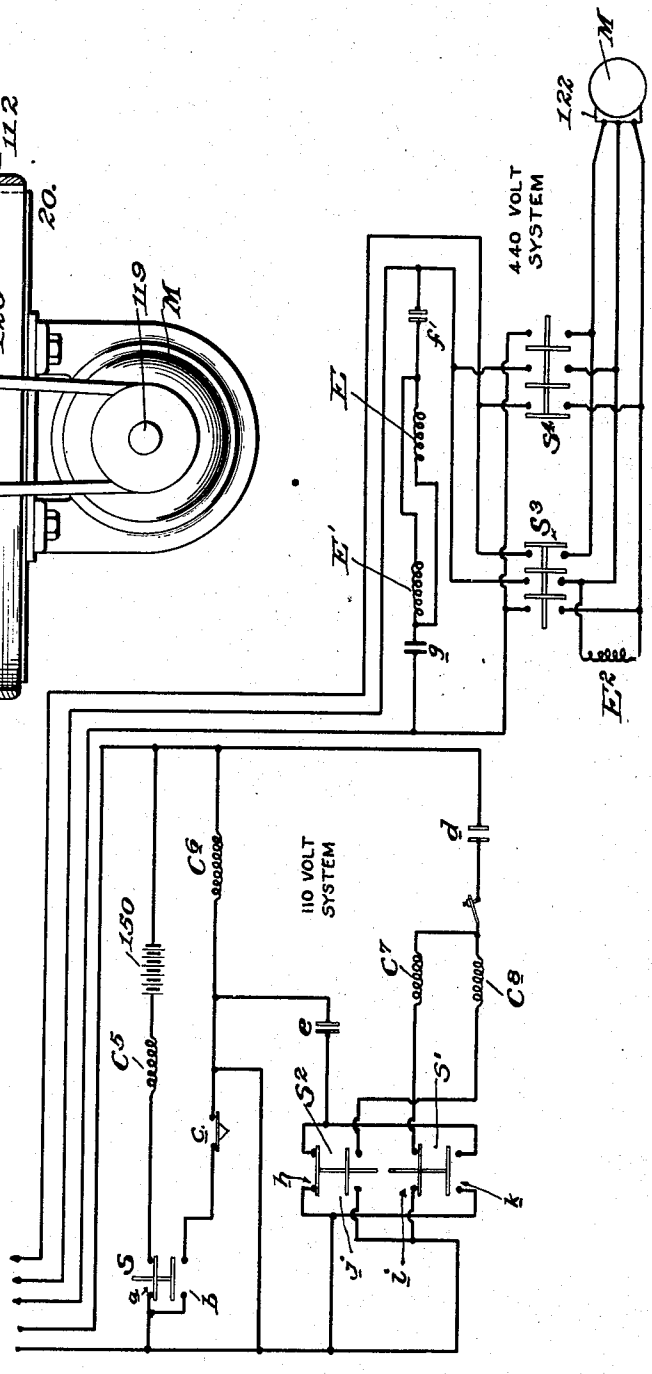


Fig. 10.



INVENTORS.
P. F. Lockett, W. C. Jones and H. G. Bailey
BY Carl G. Staelin
ATTORNEY

Feb. 10, 1942. P. F. LOCKETT ET AL 2,272,215

AUTOMATIC CUTOFF DEVICE

Filed Dec. 4, 1939 5 Sheets-Sheet 5

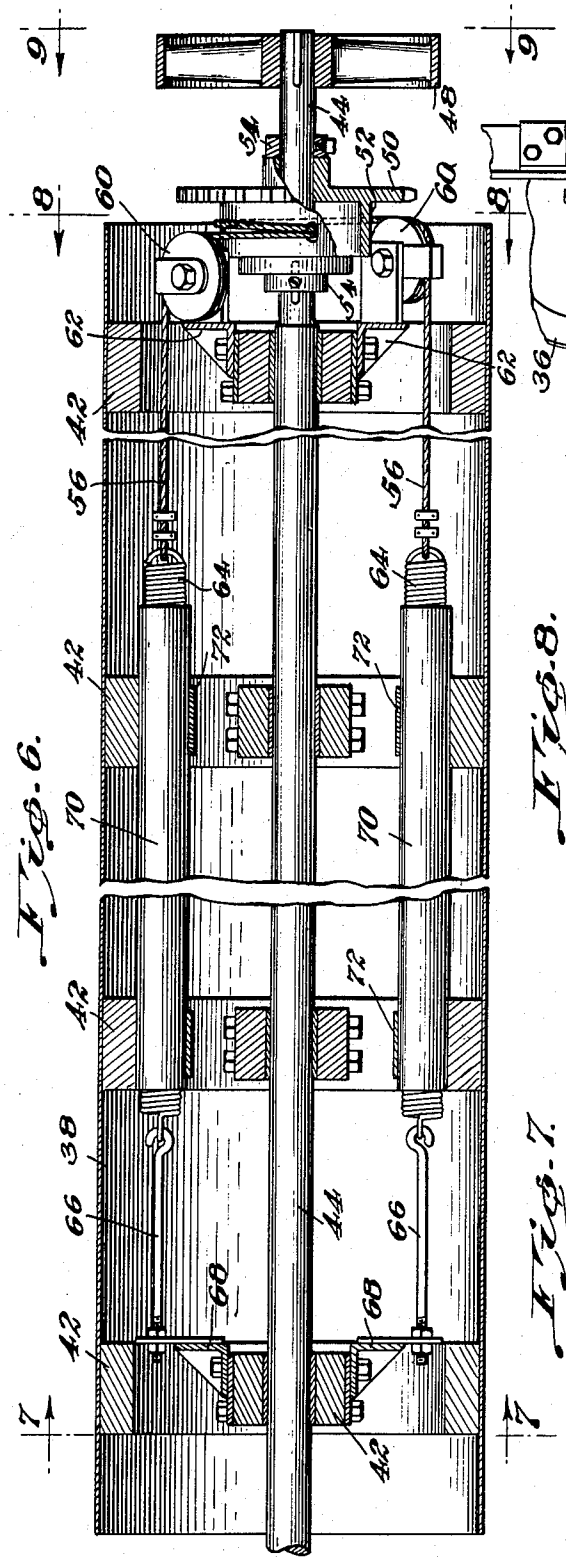


Fig. 6.

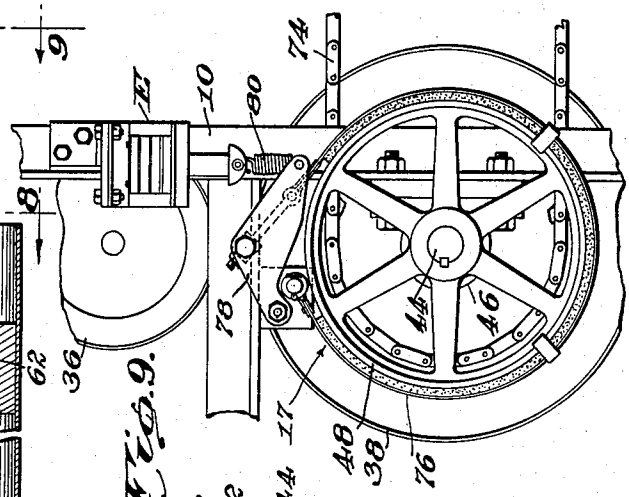


Fig. 9.

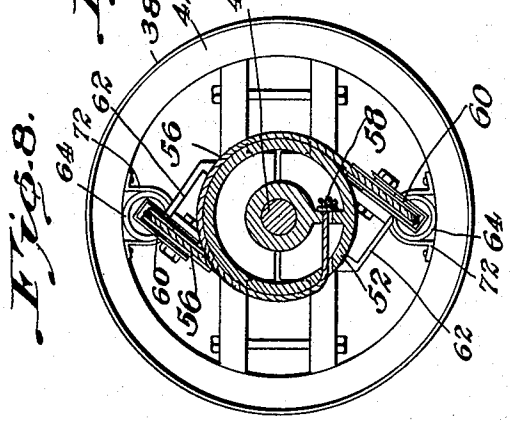


Fig. 8.

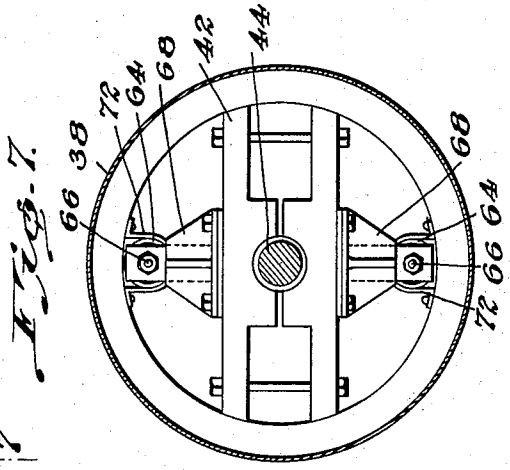


Fig. 7.

INVENTORS.
P. F. Lockett, W. C. Jones and H. G. Bailey,
BY Carl G. Stallin
ATTORNEY

Patented Feb. 10, 1942

2,272,215

UNITED STATES PATENT OFFICE

2,272,215

AUTOMATIC CUTOFF DEVICE

Paul F. Lockett, Weston C. Jones, and Harold G. Bailey, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, a corporation of Delaware

Application December 4, 1939, Serial No. 307,418

18 Claims. (Cl. 164—74)

The improved cut-off device comprising the present invention is primarily adapted for use in periodically severing insulation blankets of a predetermined length from the advance or forward end of a continuously moving sheet of blanket or bat stock as the latter issues from a stitching machine or the like wherein the bat material, together with its backing sheets, are assembled and stitched together. The invention however is applicable to products other than insulation blankets and the same may be employed for severing sections of predetermined length from continuously moving flexible sheet material regardless of its nature or of the use to which the severed sections are to be put.

The principal object of the invention is to provide an apparatus of the character set forth above in which the severing operation upon the continuously moving sheet material may be performed without interrupting the operation of the stitching machine. In this manner the entire time interval consumed by the severing operation is also available for stitching and an increase in production is therefore made possible. In carrying out this object the invention contemplates the creation of a slack portion in the continuously moving sheet material while another portion thereof is held stationary and operated upon by the severing means. When the stationary portion of the sheet material is released, the succeeding feed to the severing means is at least partially completed by automatically drawing the sheet forwardly at an accelerated rate of speed for the exact distance necessary to take up the slack portion thereof.

It is another object of the invention to provide an apparatus of this nature which will perform periodic severing operations upon the continuously moving sheet material rapidly, accurately and uniformly, evenly, and without damage to the material.

Rapidity of operation is attained as previously described by permitting the stitching machine to operate while the severing operations are being conducted.

Accuracy and uniformity in severing are attained by the provision of a limit switch in the path of movement of the oncoming sheet material which, when engaged by the material, operates to temporarily terminate the feed to the severing station (while still permitting the stitching operations to continue) so that the length of material fed for severing is substantially the same in each instance.

Evenness in severing is accomplished by compressing the sheet material on opposite sides of the line of severance during the severing operation in order that the severing means shall have a more dense material through which to cut.

Prevention of damage or preservation of the freshly finished surfaces of the sheet material is accomplished by uniform treatment of the sheet material without induced tensions or other unusual stresses which may tear or mutilate the material throughout its passage through the stitching machine and cut-off device, despite the fact that a portion of the sheet is held stationary during the periodic severing operations.

A still further object of the invention is to provide a cut-off device which may be adjusted to accommodate sheet material of varying thicknesses.

Yet another object of the invention, in a machine of this character, is to provide an adjustable means for regulating the measured lengths of sheet material fed forwardly to be severed into individual lengths.

Other objects of the invention, not at this time enumerated, will become apparent as the nature of the invention is better understood.

In the accompanying five sheets of drawings:

Fig. 1 is a side elevational view of a cut-off device manufactured in accordance with the principles of the present invention and showing the sheet material issuing thereto from a stitching machine by means of which the material is assembled;

Fig. 2 is an enlarged fragmentary sectional view taken longitudinally through the apparatus in the vicinity of the severing station and showing the severing instrumentalities in side elevation;

Fig. 3 is a sectional view taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 3;

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 2;

Fig. 6 is a longitudinal sectional view taken substantially centrally through one of a pair of pinch rollers employed in connection with the invention;

Fig. 7 is a sectional view taken substantially along the line 7—7 of Fig. 6;

Fig. 8 is a sectional view taken substantially along the line 8—8 of Fig. 6;

Fig. 9 is an end view of one pair of pinch rollers and associated mechanism viewed in the direction 9—9 of Fig. 6; and

Fig. 10 is a diagrammatic view of the electrical

circuits employed for controlling and operating the various moving machine instrumentalities.

Brief Description of the Apparatus

Referring now to Fig. 1, briefly the cut-off apparatus includes a framework 10 upon which there is mounted a pair of squeeze or pinch rolls 12 which are driven in timed relationship with the stitching machine (not shown) and which serve to draw the stitched blanket or bat sheet material B continuously from the latter at a constant rate of speed, or at least at a rate of speed commensurate with the speed of operation of the stitching machine. A second pair of pinch rolls 14, hereinafter referred to as the feed rolls, similarly mounted on the framework 10, receive the material B from the first pair of pinch rolls 12 and periodically advance the same along a table portion 16 provided by the framework 10 and by a portion of an endless discharge belt 25 and upon which table portion the material is severed into individual sections or insulation blankets. The rolls 14 are driven in such a manner that immediately prior to each severing operation they are operated upon by a braking mechanism 17, Fig. 9, and are stopped so that the forward or advance portion of the sheet material B is held stationary for the duration of the severing operation. Thereafter the rolls 14 resume their sheet drawing operation while at the same time they regain their lost motion after which they continue to rotate uniformly to advance the forward portion of the sheet on the table portion 16 until such time as they are again momentarily stopped. Inasmuch as the rolls 12 are driven or operate continuously while the rolls 14 operate intermittently, a slack portion indicated at B' is created in the sheet material B between the two pairs of rolls 12 and 14 each time the latter pair becomes stationary. As the feed rolls 14 resume their operation the slack portion B' is taken up by a temporary increase in speed over the normal speed of the rolls 14 and thereafter the entire sheet B is advanced uniformly through the apparatus until such time as sufficient material has been fed onto the table portion 16 to warrant the next succeeding severing operation.

The severing operation is performed by means of a circular cut-off saw or knife blade 18 mounted on a reciprocating carriage 20 projecting through a transverse slot 22 formed in the table portion 16. A motor M which operates the saw 18 also serves to reciprocate the carriage 20 during normal machine operations. The saw 18 is operated during travel of the carriage 20 across the table portion 16 laterally in either direction, successive severing operations being performed while the carriage 20 moves alternately in opposite directions.

During the actual severing operation, a clamping mechanism or assembly 24 engages the sheet material B on opposite sides of the transverse slot 22 and serves to compress the former firmly against the framework in the table region thereof in order that the saw 18 in traveling across the latter may perform its severing function neatly and with dispatch. The endless belt or conveyor 25 previously referred to is driven continuously from a motor M' and a portion thereof passes through the table portion 16 and serves to conduct the severed sections from the apparatus. The rate of surface movement of the belt 25 is in excess of the maximum rate of surface speed of the feed rolls 14 in order that the severed sections may rapidly be removed from the apparatus without interfering with subsequent machine operations. Guide rails 27 forming part of the framework 10 serve to prevent the severed sections from shifting laterally before they are clear of the machine.

A limit switch S is mounted on the framework 10 and is provided with an arm 23 that projects into the path of movement of the forward edge of the advancing sheet material on the table portion 16 to be actuated thereby. The switch S is associated with a system of electrical control instrumentalities and circutis including a 110 volt circuit and a 440 volt circuit, the nature of which will be set forth presently, in such a manner as to cause the various machine instrumentalities to operate in proper timed relationship to one another to produce insulation blanket sections of uniform length.

The Continuously Driven Pinch Rolls

Referring to Fig. 1, the continuously driven pinch rolls 12 include an upper idler roller 28 and a lower cooperating driven roller 30, the latter being continuously driven by means of a chain 32 from the stitching mechanism. The upper idler roller 28 is adjustable toward and away from the lower driven roller 30 by means of an adjusting mechanism 34 in order to accommodate sheet material of varying thickness.

The Intermittently Driven Feed Rolls

The feed rolls 14 (Fig. 1) include an upper roller 36 and a lower brake roller 38, the upper roller being similar in its construction to the upper idler roller 28 and being similarly adjustably mounted on the framework 10. A conventional compensating chain and sprocket mechanism 40 connects the two rollers 36 and 38 in driving relationship regardless of the adjusted position of the former roller with respect to the latter.

The lower brake roller 38 (see also Figs. 6 to 9 inclusive) is of hollow cylindrical design and is rigidly mounted by means of a series of longitudinally spaced clamping spiders 42 on a central shaft 44 which in turn is rotatably supported from the framework 10 by means of bearings 46 (Fig. 9).

The shaft 44 projects outwardly a short distance at the remote side of the apparatus as viewed in Fig. 1 and has mounted thereon a brake drum 48 (see also Fig. 6). Spaced inwardly from the brake drum 48 on the central shaft 44 (Fig. 6) and capable of independent turning movement on the latter is a driving sprocket 50 having a drum portion 52 associated therewith. The sprocket 50 is capable of limited axial adjustment on the shaft 44 and may be maintained in its adjusted position by means of a pair of collars 54 on opposite sides thereof. A pair of cables 56 (Figs. 6 and 8) have their adjacent ends anchored as at 58 to the drum portion 52 of the driving sprocket 50 and pass over a pair of sheaves 60 which are supported by brackets 62 from one of the clamping spiders 42. The other ends of the cables 56 are connected to a pair of coil springs 64 which are anchored by means of eye-bolts 66 to brackets 68 carried by another of the clamping spiders 42. Cylindrical guide members 70 surround the coil springs 64 and are suitably secured by means of brackets 72 to adjacent spiders 42.

The sprocket 50 is continuously driven at a constant rate of speed by means of a chain 74

(Fig. 1) that derives its motion from the pinch rolls 12.

The respective diameters of the various rollers that cooperate to make up the pinch rolls 12 and the feed rolls 14, as well as the character of the driving connection between these two pairs of rolls is such that normally when the brake drum 48 is free to rotate the surface speed of both pairs of rolls 12 and 14 is identical and the sheet material B moves uninterruptedly through the apparatus and is fed to the table portion 16 so that its forward end approaches the limit switch S. During such movement of the forward portion of the sheet material, the springs 64 are contracted and driving torque is applied to the brake roller 38 from the sprocket 50 through the cables 56 and coil springs 64. Means are provided, however for periodically applying a braking torque to the shaft 44 to halt the movement of the feed rolls 14 and consequently to hold the forward portion of the sheet material B stationary and in such an instance the driving sprocket 50 continues to rotate and override the brake roller 38 until after the severing operation has been effected by the cut-off saw 18. Such overriding of the brake roller 38 by the sprocket 50 causes the cables 56 to be wound upon the drum portion 52 of the former with an attendant elongation of the coil springs 64 under tension. After the brake drum 48 has been released, the tension which has accumulated in the coil springs 64 is released through the cables 56 and the brake roller 38 is restored to its normal angular position with respect to the central shaft 44. Thus the lost motion to which the brake roller 38 was subjected is regained to an exact degree thereby as the cables 56 unwind on the drum portion 52 of the continuously rotating sprocket 50.

Referring now to Fig. 1, it will be seen that at such time as the pair of feed rolls 14 remains stationary due to the application of braking torque to the brake drum 48, the pair of pinch rolls 12 which continue to draw the sheet material B from the stitching machine feed this material forwardly toward the stationary feed rolls 14 thus creating the slack portion B' between these two pairs of rolls. As soon as the severing operation is completed and the brake drum 48 is released, the slack portion B' is taken up by the momentary increase in speed of the feed rolls 14 as previously described. Thereafter, until the next succeeding severing operation, the entire sheet B is fed uniformly forwardly onto the table portion 16 and toward the limit switch S.

The Feed Rolls Braking Mechanism

Referring now to Fig. 9, the braking mechanism 17 for periodically applying a braking torque to the brake drum 48 includes a circular brake band 76 having one end anchored to the framework and the other end connected to a bell crank operating lever 78 also pivoted to the framework. One arm of the lever 78 is connected by means of a spring 80 to the movable core of a solenoid E suitably secured to the framework. It is obvious that as the solenoid E is energized, the movable core thereof will be retracted to actuate the braking mechanism in its entirety and apply a braking torque to the brake drum 48 and stop the movement of the pair of feed rolls 14.

The Clamping Mechanism

The clamping mechanism by means of which the sheet material B is compressed on opposite sides of the transverse slot 22 consists of a clamping frame 88 including a pair of parallel spaced clamping bars 90 at the lower end thereof. The frame 88 is mounted for vertical movement in guides 94 provided in a superstructure 96. A piston 98 connected to the frame 88 operates in a cylinder 100 and its movements in the latter are controlled by means of a control valve V having connections 102 and 104 to opposite ends of the cylinder for the admission of compressed air thereto. A solenoid E^1 is employed for controlling the operation of the valve V and is so designed that upon energization of the same the valve V is actuated to admit air to the upper end of the cylinder to drive the piston 98 downwardly therein and cause the clamping bars 90 to engage the blanket sheet material B on opposite sides of the slot 22 to compress the same. Upon deenergization of the solenoid E^1 the valve V is actuated to admit air to the lower end of the cylinder to move the piston upwardy therein and cause the clamping bars 90 to release the severed sheet material.

Referring to Figs. 1 to 5 inclusive, and in particular to Fig. 2, the carriage 20 includes a framework 112 which is suspended beneath the table portion 16 by means of traction wheels 114 supported on tracks 113 carried by a pair of I-shape angle pieces 115 secured to the framework 10 of the apparatus. A saw shaft 116 is journalled in bearings 118 on the carriage framework and one end thereof projects beyond the edge thereof and carries the circular cut-off saw 18 which projects upwardly through the slot 22 in the table portion 16. The shaft 116 is adapted to be periodically and alternatively rotated in opposite directions by means of the reversible motor M suspended below the framework 112. The motor M is provided with a motor shaft 119 which is connected to the shaft 116 by means of a plurality of V-belts 120. Current for driving the motor M is supplied thereto by means of a trolley arrangement 122.

The carriage 20 is driven in either direction across the framework 10 by means of a tractional driving mechanism including stationary rack bars 123 (Figs. 2 and 5), one of which is secured to the underneath side of each of the angle pieces 115. The rack bars mesh respectively with traction pinions 124 mounted on a shaft 126. A chain and sprocket driving mechanism 128 connects the two shafts 126 and 116. Thus it will be seen that rotation of the shaft 116 in either direction, as controlled by the reversible motor M will cause simultaneous operation of the saw 18 and traversing of the carriage 20 across the framework in one direction or the other.

In order that the carriage 20 shall not overrun its proper limits of movement at either end of the tracks 113, the motor shaft 119 has mounted thereon a brake drum 121 (Fig. 2) to which braking torque may be periodically applied by means of a braking mechanism 125 similar to the braking mechanism 17. The braking mechanism 125 is normally held in operative braking relation by means of a spring 127 but is adapted to be rendered inoperative by means of a solenoid E^2, hereinafter referred to as the saw brake solenoid.

A frog 130 (Figs. 2 and 3) having opposite cam surfaces 132 and 134 is bolted or otherwise secured to the carriage frame 112 and is designed for alternate engagement with a pair of arms 136 and 138 which are mounted for adjustment transversely of the framework 10 on a squared shaft

140 at opposite sides of the framework. Engagement of the cam surface 132 with the arm 136 at one side of the framework causes the squared shaft 140 to be turned in a clockwise direction as viewed in Fig. 2, while engagement of the cam surface 134 with the arm 138 at the other side of the framework causes the shaft 140 to be turned in a counterclockwise direction as viewed in this figure.

The squared shaft 140 is connected by mechanical means (not shown) to a pair of limit switches S^1 and S^2 (Fig. 10 only) in such a manner that upon turning movement of the shaft in one direction or the other both switches are operated simultaneously. The limit switches S^1 and S^2 (Fig. 10) are connected in an electrical system including a 110 volt and a 440 volt circuit in a manner that will appear presently so that they control the operation of the saw brake solenoid E^2.

The switches S^1 and S^2 also operate through electrical instrumentalities and circuits that will be described presently to supply current to the saw motor M to turn the motor shaft 119 thereof in either direction.

Operation of the Apparatus

(Including a description of the electrical circuits therefor)

In the operation of the apparatus the blanket material B is continuously drawn from the stitching machine by means of the draw or pinch rolls 12 and is fed thereby to the intermittently operable feed rolls 14. From the feed rolls 14 the material is advanced on the table portion 16 of the apparatus and passes over the slot 22 and beneath the normally elevated clamping bars 90, and approaches the limit switch S as it travels.

Prior to the time the forward edge of the sheet material engages the arm 23 of the limit switch S, the contacts *a* of this latter switch remain closed, thus completing a 110 volt circuit through a rectifier 150 (Fig. 10) and energizing a time delay drop-out coil C^5 which maintains a pair of contacts *c* closed.

As soon as the sheet material engages the arm 23 of the switch S, the contacts *a* become open while the contacts *b* become closed, thus actuating a relay coil C^6 which upon actuation simultaneously closes two pairs of contacts *d* and *e* in the 110 volt system and two pairs of contacts *f* and *g* in the 440 volt system.

Closing of the contacts *f* and *g* in the 440 volt system causes the solenoids E and E^1 to be simultaneously energized, the former solenoid actuating the braking mechanism 17 and stopping the feed rolls 14 and the latter solenoid actuating the valve V in such a manner as to admit compressed air to the upper end of the cylinder 100 to lower the piston 98 therein and force the clamping bars 90 downwardly to engage the blanket on opposite sides of the slot 22. As soon as the feed rolls 14 are thus stopped, forward movement of the forward portion of the sheet material is terminated. Since the pinch or draw rolls 12 continue to operate, the slack indicated at B' in Fig. 1 begins to accumulate in the material between the rolls 12 and 14 and continues to accumulate during severing of the section from the material by the saw blade 18.

Closing of the contact *d* in the 110 volt system energizes a coil C^7 which controls the operation of a switch S^3 and which upon energization serves to close this latter switch and energize the solenoid E^2 thus releasing the saw motor braking mechanism against the action of the coil spring 127. The closing of the switch S^3 also serves to supply starting and operating current to the saw motor M which thereupon causes the carriage 20 to traverse the framework 10 while at the same time the saw 18 traverses the slot 22 in one direction and severs a section from the forward edge of the sheet material B.

As the carriage approaches the limit of its travel, the frog 130 (Fig. 2) engages the arm 136 on the squared shaft 140 and moves the same in a clockwise direction as shown in this figure thereby opening the contacts *h* of the switch S^2 and consequently opening the 110 volt circuit through the coil C^6 which causes the contact *d*, *e*, *f* and *g* to again become open. Because of the opening of these latter four contacts, the limit switch S may occupy either of its extreme positions until the beginning of the next machine cycle when the saw carriage moves in the opposite direction without affecting further operation of the system and without causing the saw motor M to become energized and repeat prematurely.

Movement of the frog 130 into engagement with the arm 136 also causes the contacts *i* of the switch S^1 to become open, thus opening the switch S^3 and the circuit through the trolley 122 leading to the saw motor M. Opening of the switch S^3 deenergizes the solenoid E^2 and allows the braking mechanism 125 to take effect against the action of the spring 127 and stop the motor M. In this manner the saw carriage 20 is prevented from overrunning its normal traversing distance.

Opening of the contacts *f* and *g* in the 440 volt circuit causes the solenoids E and E^1 to become deenergized, the former releasing the braking mechanism 17 and permitting the feed rolls 14 to regain their lost motion in the manner previously described, and the latter actuating the valve V and causing the clamping mechanism 88 to be released to permit the forward portion of the sheet material to resume its motion toward the limit switch S.

As soon as the forward edge of the sheet material again engages the switch which has meanwhile been restored to its normal position by virtue of the removal of the previously severed section of sheet material from the apparatus on the conveyor 25, the operation just described is repeated in the next cycle of machine operation. However, during this next cycle contacts *j* and *k* associated with the limit switches S^2 and S^1 respectively will become closed instead of the contacts *h* and *i*. Likewise, the coil C^8 will become energized instead of the coil C^7. Energization of the coil C^8 will cause the switch S^4 to become closed instead of the switch S^3 and in such an instance the current supplied to the trolley 122 of the motor M will be reversed to reverse the operation of the latter and cause the carriage 20 to move across the framework 10 in a direction opposite to that in which it moved during the preceding cycle of machine operation.

Modifications and variations may be resorted to within the spirit and scope of the present invention as defined in the appended claims.

We claim:

1. In an apparatus for periodically performing an operation on a continuously moving sheet of material, means positioned at one point in the path of movement of the sheet for continuously advancing the sheet in one direction, feeding means positioned forwardly of the advancing means and driven in consonance with the ad-

vancing means, means for periodically stopping said feeding means for holding a portion of the sheet stationary and allowing a slack portion to occur between the advancing means and the feeding means, means for operating on the stationary portion of the sheet, and means for temporarily driving said feeding means at an accelerated rate to advance the stationary portion of the sheet relative to the continuously moving portion thereof to take up the slack portion.

2. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising a pair of pinch rolls between which the sheet is adapted to pass and be advanced, means for rotating one of the rollers thereof at a constant rate of speed, a rotatable drum, means connecting the drum and roller in driving relationship, a pair of feed rolls to which the sheet is fed by the pinch rolls and beyond which the sheet advances, a spring connecting the drum and one of said feed rolls, means for periodically applying a braking torque to said latter roll to stop the normal movement thereof and anchor a portion of the sheet while the drum continues to rotate and tension said spring, and means for severing a section from the anchored portion of the sheet.

3. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising a pair of pinch rolls between which the sheet is adapted to pass and be advanced, means for rotating one of said rolls at a constant rate of speed, a shaft, a pair of feed rolls to which the sheet is fed by the pinch rolls and beyond which the sheet advances, one of said feed rolls being secured to a rotatable shaft, a drum rotatably mounted on the shaft, a spring connecting the shaft and drum, means connecting the drum and driven pinch roll in driving relationship, means for periodically applying a braking torque to the shaft to stop the normal rotation of the roll and anchor a portion of the sheet while the drum continues to rotate and tension said spring, and means for severing a section from the anchored portion of the sheet.

4. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising a pair of pinch rolls between which the sheet is adapted to pass and be advanced, means for rotating one of the rollers thereof at a constant rate of speed, a pair of feed rolls to which the sheet is fed by the pinch rolls and beyond which the sheet advances, means for rotating the feed rolls, means operable when the sheet has advanced a predetermined distance beyond the feed rolls for stopping the motion of the latter, means for severing a section from the sheet when the feed rolls are motionless, means for automatically removing the severed section from the apparatus, and means operable upon removal of the severed section for rendering said stopping means inoperative.

5. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising a pair of pinch rolls between which the sheet is adapted to pass and be advanced continuously, means for rotating one of the rollers thereof at a constant rate of speed, a shaft, a pair of feed rolls to which the sheet is fed by the pinch rolls, said feed rolls including a roller secured to the shaft, a drum mounted for independent turning movement on the shaft, a spring connecting the drum and shaft, means connecting said pinch roller and drum in driving relationship, means operable when the sheet has advanced a predetermined distance beyond the feed rolls for applying a braking torque to the shaft to stop the same, means for severing a section from the sheet when such braking torque is applied to the shaft, means for automatically removing the severed section from the apparatus, and means operable upon removal of the severed section for rendering said torque applying means inoperative to release the shaft.

6. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising in combination a framework having a table portion upon which the sections are severed from the sheet at a severing station, means for continually feeding the sheet of material toward the table portion, means for intermittently advancing a portion of the sheet being fed over the table portion and past the severing station, said last mentioned means comprising a feed roller, a central shaft upon which the feed roller is mounted and to which it is secured, a drum mounted on the shaft for independent turning movement, a spring connecting the roller and drum, means for continuously rotating the drum, a brake wheel secured to the shaft, a braking mechanism for the brake wheel, means for actuating the braking mechanism, and means at the severing station for severing a section from the sheet.

7. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising in combination a framework having a table portion upon which the sections are severed from the sheet at a severing station, means for continually feeding the sheet of material toward the table portion, means for intermittently advancing a portion of the sheet being fed over the table portion and past the severing station, said last mentioned means comprising a feed roller, a central shaft upon which the feed roller is mounted and to which it is secured, a drum mounted on the shaft for independent turning movement, a spring connecting the roller and drum, means for continuously rotating the drum, a brake wheel secured to the shaft, a braking mechanism for the brake wheel, a solenoid for actuating the braking mechanism, means at the severing station for severing a section from the sheet, and means for energizing the solenoid.

8. A cut-off apparatus for severing sections of a predetermined length from a sheet of material comprising in combination a framework having a table portion upon which the sections are severed from the sheet at a severing station, means for continuously feeding the sheet of material toward the table portion, means for intermittently advancing a portion of the sheet being fed over the table portion and past the severing station, said last mentioned means comprising a feed roller, a central shaft upon which the feed roller is mounted and to which it is secured, a drum mounted on the shaft for independent turning movement, a spring connecting the roller and drum, means for continuously rotating the drum, a brake wheel secured to the shaft, a braking mechanism for the brake wheel, a solenoid for actuating the braking mechanism, means at the severing station for severing a section from the sheet, an electrical circuit for energizing the solenoid including a switch, and means for actuating the switch cooperating with movement of the forward end of the sheet material on said table portion.

9. The method of severing sections of a predetermined length from the forward advancing

portion of a continuously moving flexible sheet of material which comprises feeding said sheet synchronously with the continuous movement thereof, periodically holding the fed portion of the sheet material stationary while allowing a slack to occur in another portion thereof, severing a section from the stationary portion, and temporarily feeding the remaining stationary portion at an accelerated rate relative to the continuously moving portion in the direction of movement of the sheet a distance sufficient to take up the previously created slack.

10. The method of severing sections of a predetermined length from a flexible sheet of material which comprises advancing the sheet continuously in its own plane, feeding the sheet in consonance with the advancing movement, periodically holding the fed portion including the forward edge of the sheet stationary and allowing a slack to occur in the advancing portion therebehind, severing a section from the portion being held, and thereafter releasing the latter portion and temporarily feeding the same at higher rate relative to the continuous advancement in the direction of its original movement a distance sufficient to take up the previously created slack.

11. A cut-off apparatus for severing transverse sections of a predetermined length from the forward end of an elongated strip of material which comprises means for advancing said material continuously at a constant rate of speed, feed rolls through which said material passes spaced from said advancing means forwardly thereof with respect to the material, cutting means forwardly of the feed rolls for cutting a section of predetermined length from the material, means for normally driving said feed rolls at a rate to advance the material equally with the advancing means, braking means for halting the movement of the feed rolls and consequently the forward end of the material during the severing operation and causing the advancing means to produce slack in said material between the same and the feed rolls, said driving means including yielding energy storing means adapted to store driving energy for the feed rolls during the functioning of the braking means and to release the stored energy to said feed rolls in the form of increased driving torque when the cutting operation is completed and the braking means is released to cause the feed rolls to advance the forward end of the material at an accelerated rate until it has assumed the position it would normally have assumed had it not been halted by the braking mechanism.

12. A cut-off apparatus for severing transverse sections of a predetermined length from the forward end of an elongated strip of material which comprises a pair of pinch rolls for advancing said material continuously at a constant rate of speed, feed rolls through which said material passes spaced from said pinch rolls forwardly thereof with respect to the material, cutting means forwardly of the feed rolls for cutting a section of predetermined length from the material, means for normally driving said feed rolls and pinch rolls at a like speed, braking means adapted to halt the movement of the feed rolls and consequently the forward end of the material during the severing operation and causing the pinch rolls to produce slack in said material between the same and the feed rolls, said driving means including yielding energy storing means adapted to store driving energy for the feed rolls during the functioning of the braking means and to release the stored energy to said feed rolls in the form of increased driving torque when the cutting operation is completed and the braking means is released to cause the feed rolls to advance the forward end of the material at an accelerated rate until it has assumed the position it would normally have assumed had it not been halted by the braking mechanism.

13. A cut-off apparatus for severing transverse sections of a predetermined length from the forward end of an elongated strip of material which comprises a pair of pinch rolls for advancing said material continuously at a constant rate of speed, feed rolls through which said material passes spaced from said pinch rolls forwardly thereof with respect to the material, cutting means forwardly of the feed rolls for cutting a section of predetermined length from the material, means for normally driving said feed rolls and pinch rolls at a like speed, braking means adapted to halt the movement of the feed rolls and consequently the forward end of the material during the severing operation and causing the pinch rolls to produce slack in said material between the same and the feed rolls, clamping means for clamping and compressing the material in the vicinity at which it is cut during the cutting operation, said driving means including yielding energy storing means adapted to store driving energy for the feed rolls during the functioning of the braking means and to release the stored energy to said feed rolls in the form of increased driving torque when the cutting operation is completed and the braking and clamping means are released to cause the feed rolls to advance the forward end of the material at an accelerated rate until it has assumed the position it would normally have assumed had it not been halted by the braking mechanism.

14. In apparatus for periodically performing an operation on a continuously advancing web, the combination of feeding means for the web driven at the same rate as the advancing movement of the web, means for periodically stopping the feeding means to hold the forward portion of the web stationary, means for operating on the stationary portion of the web, and means for temporarily driving the feeding means at a higher rate than the advancing movement to take up the slack in the web created by stopping the feeding means.

15. In an apparatus for periodically performing an operation on a web of material, means positioned at one point along the web for continuously advancing the same in one direction, feeding means positioned forwardly of the advancing means and driven in consonance with the advancing means, means for periodically stopping said feeding means for holding a portion of the web stationary and allowing a slack portion to occur in the web between the advancing means and the feeding means, a clamp for clamping the stationary portion of the web, means for operating on the stationary portion of the web, means for releasing the clamp, and means for temporarily driving said feeding means at an accelerated rate to advance the previously held stationary portion of the web relative to the continuously moving portion thereof to take up the slack portion.

16. In an apparatus for periodically performing an operation on a sheet of material, means positioned at one point along the sheet for continuously advancing the same in one direction,

a pair of feed rolls positioned in the path of movement of the advancing sheet and between which the sheet passes, a synchronous driving connection between said advancing means and said feed rolls, means for periodically stopping said feed rolls, means for applying a torque in addition to the driving torque to the feed rolls after they have been stopped to cause an acceleration thereof to advance a portion of the sheet relative to the advancing movement of the sheet, and means for operating on the stationary portion of the sheet.

17. In an apparatus for periodically severing sections of a predetermined length from a sheet of material, means positioned at one point along the sheet for continuously advancing the same in one direction, a pair of feed rolls positioned in the path of movement of the advancing sheet and between which the sheet passes, driving means for driving the feed rolls at the same speed as that at which the sheet is advanced, means for periodically stopping the feed rolls for a predetermined time to permit severing and then applying a torque to the feed rolls in addition to the driving torque to advance a portion of the sheet relative to the continuous advancement of the sheet a predetermined distance, and means for severing a section from the latter portion of the sheet when the same is stationary.

18. In an apparatus for periodically severing sections of a predetermined length from a sheet of material, a pair of pinch rolls positioned at one point along the sheet for continuously advancing the sheet in one direction, a pair of feed rolls to which the sheet is fed by the pinch rolls, means for continuously operating the pinch rolls, a driving connection between said pinch rolls and said feed rolls whereby they are driven in synchronism, means for periodically stopping the feed rolls to hold a portion of the sheet stationary and allow slack to form in the sheet between the feed rolls and the pinch rolls, means for severing the stationary portion of the sheet, and means for temporarily driving the feed rolls at an accelerated rate to take up the slack after being stopped.

PAUL F. LOCKETT.
WESTON C. JONES.
HAROLD G. BAILEY.