SHUTTLE-TYPE DISPENSER OF RIBBON SEGMENTS


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SHUTTLE-TYPE DISEENSER OF
RIBBON SEGMENTS
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This invention relates to dispensing segments of a tenuous ribbon and more particularly to unwinding a roll of such ribbon and delivering equal lengths of the unwound ribbon to a desired work locus.

The problem of automatically taking off a soft and tender sheet from a roll thereof and severing equal-sized segments from the unrolled sheet which are deposited in a smooth condition in a predetermined work area has rarely been encountered in commercial operations but now has become particularly important with the recent development of tobacco sheets which, as disclosed in U.S. Patenits 2,592,553 and 2,592,554 to W. G. Frankenburg and P. W. Garbo, are made by mixing dry-ground tobacco with a highly viscous aqueous solution of a binder to form a paste, spreading the paste in a thin layer and drying the layer to leave a coherent film or tobacco sheet. The ribbon segments are desired in the manufacture of smoking products; for instance, such pieces of tobacco sheet may be used as tobacco bunch binders in the manufacture of cigars. Prior mechanisms for the purposes contemplated herein have failed to function successfully with a tenuous ribbon because these mechanisms depend on an appreciable tensile strength in the ribbon for proper operation.

In accordance with this invention, segments of a weak and limp ribbon are dispensed from a roll thereof in a smooth condition in a predetermined work area by the steps of gently pulling out the starting or leading end of the ribbon away from the ribbon roll and over the desired work area while the roll is rotatably held in a fixed position, severing from the pulled out portion of the ribbon the desired segment while the pulled out portion is held in a smooth condition in the predetermined work area and repeating the pulling and severing steps using the new leading end of the ribbon which is formed with each severing step. In short, the invention contemplates means for rotatably holding the roll of ribbon in a fixed position, shuttle means adapted to move reciprocatingly away from and toward the fixed position of the ribbon roll, roll means mounted on the shuttle means operative to hold the leading end of the ribbon without rotating while the shuttle means is moving in one of its two reciprocating directions and to rotate and thereby pay out the ribbon while the shuttle means is moving in the other of its two reciprocating directions, and cutting means operative to sever a desired ribbon segment from the paid out ribbon at the end of each movement of the shuttle means during which the roll means rotates.

For a better understanding of the invention, reference is now made to the accompanying drawings which illustrate two preferred embodiments with like reference characters indicating the same or like parts and of which:

FIGURE 1 is an elevation of apparatus forming one embodiment, hereinafter designated as the vacuum roll machine;

FIGURE 2 is essentially a right end view of the vacuum roll machine;

FIGURE 3 is a sectional view taken along the line 3-3 of FIGURE 1;

FIGURE 4 is an enlarged partial elevation like FIGURE 1 but shows the vacuum roll of the machine in section as indicated by the line 4-4 of FIGURE 2;

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FIGURE 5 is a sectional plan of the vacuum roll machine taken along the line 5-5 of FIGURE 1;

FIGURE 6 is a diagrammatic elevation showing the principal movements of the vacuum roll machine during operation;

FIGURE 7 is an elevation of apparatus forming another embodiment of the invention, hereinafter designated as the contact roll machine;

FIGURE 8 is essentially a plan of the contact roll machine;
FIGURE 9 is a sectional view taken along the line 9 - 9 of FIGURE 7;
FIGURE 10 is a partial sectional view taken along the line $\mathbf{1 0}-10$ of FIGURE 7; and

FIGURE 11 is another partial sectional view taken along the line $11-11$ of FIGURE 9.
The vacuum roll machine comprises a supporting frame A having two horizontal bars 10 , 11 and two vertical bars $\mathbf{1 2}, 13$ which are screwed or otherwise rigidly fastened together to form a rectangular frame. As shown in FIGURE 1, supporting frame A may be mounted on post pedestals 14,15 to which it is fastened by bolt clamps 16,17 . Upper bar 11 has a bracket 18 in which an axle rod 19 is rigidly held by bolt clamp 20. Axle 19 carries a rotatable sleeve 21 which is provided with two arms 22, 23. At the end of arm 22 is mounted a freely rotatable idler roll 24 , while arm 23 carries a counterweight 25 which may be set closer to or farther from sleeve 21 as desired. A rotatable bearing sleeve $19 a$ surrounds axle 19 and supports two spool ends 26, 27 between which a roll 28 of the tenuous ribbon is inserted. The inner tapered faces $26 a, 27 a$ of spool ends 26,27 , are pressed into frictional engagement with the ends of hollow core 29 on which the ribbon roll 28 is wound. Spool end 27 is pressed onto one end of bearing sleeve $19 a$ and spool end 26 is adjustably fastened by a set screw onto the other end of sleeve $19 a$. Thus, ribbon roll 28 rotates as a unit with spool ends 26, 27 and sleeve $19 a$ about axle 19 and is kept on axle 19 by collar 30 which is adjustably clamped on axle 19 . A sensitive brake to control the rotation of roll 28 is provided by rigid bracket 32 extending from frame $A$ of the machine and holding one end of a leather strip or brake band 33 which is looped around a circumferential groove 31 on spool end 27 and which has its other end attached to a light coil spring 34 suspended from peg 35 on arm 22. As shown in FIGURE 1, ribbon $R$ from roll 28 loops around idler roll 24 and extends downwardly to lower portions of the machine. When a downward pull is exerted on the ribbon, idler 24 moves clockwise since it is attached to rotatable sleeve 21 by arm 22; such clockwise movement of idler 24 causes slackening of the loop comprising band 33 and spring 34 with the result that ribbon roll 28 with spool ends 26,27 and bearing sleeve $19 a$ is free to rotate on axle 19 and the ribbon is unwound from roll 28 as it is pulled over idler 24 toward the lower portion of the machine. When the pull on the ribbon is stopped, idler 24 moves counterclockwise to its original position under the influence of counterweight 25 which has also been displaced clockwise while the ribbon was being pulled. Obviously, with the return of idler 24 and arm 22 to the original position, brake band 33 again engages groove 31 of spool end 27 and keeps the ribbon roll 28 from unraveling itself through momentum.

A movable frame B having two horizontal bars 36,37 and two vertical bars 38,39 which are rigidly fastened together in the form of a rectangle is provided with a central post 40 which is rigidly mounted to the movable frame at clamp block 41 on bar 36 and at clamp bar 42 on bar 37. The opposite ends of post 40 pass slidably through bearing blocks 43,44 mounted on bars 10, 11,
respectively, of the supporting frame. The tab ends of bars 36, 37 project behind bars 12, 13, and are in sliding contact with the back faces of bars 12, 13. A clamp block 45 is fixed on post 40 and link bar 46 pivotally hangs therefrom, the lower end of link bar 46 being pivotally attached to cam lever or bell crank 47. The corner of crank 47 is pegged to bar 13 by pivotal rod 48 mounted on bar 13 while the lowermost end of crank 47 is provided with a roller bearing 49 which rides against the periphery of cam disk 50. A driven shaft 51 passes through bar 13 and imparts rotation to cam disk 50 mounted thereon with the result that when roller 49 is riding on the smaller radius arc of cam disk 50 (as shown in FIGURE 1) movable frame $B$ with central post 40 drops to its lowest position, but when roller 49 is riding on the larger radius arc of cam disk 50 movable frame $B$ is raised to its highest position, the vertical reciprocating motion of movable frame B being transmitted from cam disk 50 through bell crank 47 and link bar 46 which is pivotally attached to central post 40 of the movable frame.
A rod 52 is held in spaced, parallel relation to the face of bar 36 by clamp blocks 53,54 mounted on bars 38 , 39, respectively. Another rod 55 is similarly held in spaced, parallel relation to bar 37 by clamp blocks 56, 57 mounted on bars 38, 39, respectively. Rod 52 passes through slide block 58 and rod 55 passes through slide block 59, slide blocks 58,59 being connected to one another by plate 40 to form a slidable frame C.
A link bar 61 is pivotally attached at one of its ends to slide block 58 of slidable frame $C$ and at its other end to cam arm 62. The lowermost end of cam arm 62 is pivotally pegged to bar 13 by bolt 63 while the corner of angulated cam arm 62 is provided with a roller 64 which rides in cam track 65 of internal face cam 66 that is mounted on driven shaft 51. To steady the operation of cam 66, a support bar 67 is held in spaced, parallel relation to bar 13 by bolts 48, 63 and is provided with bearing 68 to receive the free end of driven shaft 51 . Thus, when driven shaft 51 rotates, not only do cam disk 50 and bell crank 47 cause movable frame $B$ to oscillate vertically but also cam 66 and cam arm 62 cause slidable frame C to oscillate horizontally. It is clear that slidable frame C with its associated elements provides shuttle means adapted for reciprocating motion relative to supporting frame A.

A gear rack 69 is horizontally fastened to bars 38,39 of movable frame B while a gear wheel 70 which meshes with gear rack 69 is rotatably mounted on axle bolt 71 extending from the face of plate 60 of slidable frame $C$. Axle bolt 71 also supports another gear wheel 72 which has an integral ratchet 73. A small pawl 74 mounted on the face of gear wheel 70 locks with the single tooth of ratchet $\mathbf{7 3}$ when slidable frame $C$ moves from right to left as viewed in FIGURE 1 and thus cases gear wheel 72 to rotate clockwise together with gear wheel 70. A large pawl 75 is suspended from plate 60 and locks with the single tooth of ratchet 73 when slidable frame $\mathbf{C}$ slides from left to right to stop any rotation of gear wheel 72 while gear wheel 70 turns counterclockwise and pawl 74 slips over the surface of ratchet 73. Pawl 75 slips over the surface of ratchet 73 when slidable frame $C$ is sliding from right to left and gear wheels 70, 72 are both rotating 73. 73.

Slide block 58 of slidable frame $C$ has a dependent tab portion 76 with a recess to receive the plugged end of hollow shaft 77. Hollow shaft 77 is held in a fixed position in tab 76 by set screw 78. As shown in FIGURE 4, shaft 77 has two longitudinal ribs 79,80 and a slit apertüre 81. A cylindrical casing 82 is rotatably mounted on shaft 77 with the ends 83,84 of casing 82 bearing against shoulders 85,86 on shaft 77 . Casing end 84 is provided with gear teeth 87 which mesh with the teeth of gear wheel 72 so that rotation of gear wheel 72 im -
parts rotation to cylindrical casing 82. As aforesaid, gear wheel 72 can rotate only clockwise and, therefore, meshing gear 87 causes cylindrical casing 82 to rotate on fixed, hollow shaft 77 only counterclockwise. The free, open end of shaft 77 is used for attaching thereto a flexible hose (not shown) connected to a vacuum pump. Thus, when a vacuum is drawn in hollow shaft 77, a vacuum is also drawn in that portion of the annular space between shaft 77 and casing 82 which lies to the left of ribs 79 , 80 (FIGURE 4) since that portion of the annular space communicates with the core of hollow shaft 77 through aperture 81. Since cylindrical casing 82 is provided with a multiplicity of perforations 88, air will be sucked in through each perforation 88 while it is rotatively traveling counterclockwise from rib 80 to rib 79 over the vacuumized portion of the annular space between shaft 77 and casing 82. In the continued rotative travel of each perforation 88 from the point of radial alignment with rib 79 to the point of radial alignment with rib 80, air is not sucked in through such perforation 88 because the portion of the annular space between shaft 77 and casing 82 which lies to the right of ribs $\mathbf{7 9}, \mathbf{8 0}$ (FIGURE 4) does not 77 . 7 .
To operate the vacuum roll machine, the tenuous ribbon $R$ from roll 28 is looped over idler roll 24 and under idler roll 89 which rotates freely on axle 90 mounted on slide block 58 of slidable frame C and finally ribbon R is looped over rotatable casing 82 of the vacuum roll. With an operating vacuum pump connected by flexible tubing attached to the open end of hollow shaft 77, air is sucked in through the vacuumized perforations 88 of casing 82 which lie to the left of ribs 79,80 on shaft 77 (FIGURE 4) with the result that the portion of tibbon R which loops over casing 82 and covers the vacuumized perforations 88 adheres to the outer surface of casing 82 . Since the invention not only dispenses a soft and tender ribbon from a roll thereof as a smooth flat sheet but also cuts the ribbon into a plurality of sheets of equal length, a fixed knife blade 91 is so positioned relative to casing 82 that the knife edge of blade 91 contacts the outer surface of casing 82 when slidable frame $C$ which carries the vacuum roll is at the end of its sliding travel to the left and simultaneously when movable frame $B$ which carries slidable frame $C$ is at the end of its downward
movement.

With ribbon $R$ looped over casing 82 so that the leading end of ribbon $R$ is contiguous with knife blade 91 and with vacuum holding the looped portion of ribbon R to the outer surface of casing 82, the machine is ready for operation. Referring to FIGURE 1, when power is applied to shaft 51 to rotate it clockwise, cam disk 50 and bell crank 47 raise movable frame $B$ and simultaneously internal face cam 66 and cam arm 62 pull slidable frame $C$ to the right. While frame $B$ is held in the raised position and frame $C$ is being pulled to the right, gear wheel 70 is being rotated counterclockwise by gear rack 69 but during such counterclockwise motion of gear wheel 70, gear wheel 72 and casing 82 which has gear teeth 87 meshing with those of wheel 72 do not rotate and pawl 75 locks into the single tooth of ratchet 73. At the end of substantially one-half turn of cams $\mathbf{5 0}$, 66, frame $B$ is dropped to its lowered position and the movement of frame C toward the right is terminated. During the second half turn of cams $\mathbf{5 0}, \mathbf{6 6}$, frame B remains in its lowered position while frame $\mathbf{C}$ is pushed
to the left by cam arm 62 and link bar 61 . While frame to the left by cam arm 62 and link bar 61 . While frame C is moving toward the left, gear rack 69 is rotating gear
wheel 70 clockwise with the result that pawl 74 on wheel 70 locks into the single tooth of ratchet 73 , causing gear wheel 72 to turn clockwise and casing 82 to turn counterclockwise. When casing 82 is rotated counterclockwise, the leading end of ribbon $R$ is moved from the point of radial alignment with rib 79 toward the right but to the
right of rib 79 casing 82 is not vacuumized and, therefore,
ribbon $R$ falls or peels off casing 82 . At the end of the second half turn of shaft 51 , casing 82 has contacted knife blade 91, thus severing ribben $R$ along the line of contact, and frame C has terminated its sliding movement to the left. From this point on, the cyclic operation repeats itself, starting with the raising of frame B and the pulling of frame $C$ toward the right as already described. As shown in FIGURE 4, it is advisable to omit perforations 88 in the portion of casing 82 which rides over knife blade 91 to avoid the possibility of blade 91 pushing parts of ribbon $R$ into the perforations so that ribbon $R$ tends to stick to casing 82 , thereby impeding the desired peeling off of ribbon $R$ when its leading end is moved to the right of rib 79.

The contact roll embodiment of the invention shown in FIGURES 7 to 11, inclusive, comprises a supporting frame A having two longitudinal bars 101, 102 and two end bars 103, 104 which are rigidly fastened together to form a rectangular frame. Supporting frame A may be mounted on post pedestals 14,15 to which it is fastened by bolt clamps 16, 17. Longitudinal bars 101, 102 support a bearing bracket 18 and its associated members which have been described in connection with the vacuum roll machine. Extending down from end bars 103, 104 are vertical bars 105, 106, respectively.

Two parallel slide rods 107,108 at a level beneath that of longitudinal bars 101, 102, have their ends fastened to end bars 103, 104. Mounted on rods 107, 108 is a slidable frame C which comprises two parallel slide blocks 109, 110, provided with apertures through which slide rods 107, 108 pass. As shown in FIGURES 9 and 10, the apertures in blocks $\mathbf{1 0 9 , 1 1 0}$ to receive square rod 107 are slots while the apertures to receive round rod 108 are circular holes. Blocks 109,110 are held together in spaced relation to one another by horizontal plate 111. Four vertical bars 112, 113, 114, 115 depend from the four corners of plate 111. Bar 114 is directly behind bar 112 in FIGURE 7 and therefore does not appear in the drawing. An idler roll 116 has its bearings in the lower ends of bars 112,114 while the lower ends of bars 113, 115 provide bearings for contact rolls 117, 118. The ends of axle 123 of roll 118 extend through bars 113, 115 and have gear wheels 119,120 mounted thereon. A ratchet 121 is keyed to axle 123 of contact roll 118 between bar 113 and gear wheel 119. A lock pawl 122 is mounted on the face of bar 113 to cooperate with ratchet 121 and prevent clockwise rotation (FIGURE 7) of ratchet 121, roll 118 and gear wheel 120, all of which are keyed to axle 123. Gear wheel 119 is rotatably mounted on axle 123 and held thereon by retainer screw 124. Pawl 125 is attached to the inner face of gear wheel 119 and operates to engage the teeth of ratchet 121 only when gear wheel 119 is turning counterclockwise (FIGURE 7). Thus, when gear wheel 119 rotates counterclockwise, pawl 125 locks into ratchet 121 and axle 123 and all other elements keyed thereto also rotate counterclockwise, but when gear wheel 119 rotates clockwise, pawl 125 slips over ratchet 121 and pawl 122 locks into ratchet 121 so that axle 123 and all other elements keyed thereto are without rotation. Lower contact roll 117 is keyed to an axle 126 which passes through bearing blocks 127, 128 which fit in slots in the lower ends of bars 113, 115, respectively, and are held in these slots by spring clips 129, 130. Axle 126 extends beyond bearing block 128 to support a gear wheel 131 keyed thereto. The teeth of gear wheels $\mathbf{1 2 0}, 131$ mesh and since, as aforesaid, gear wheel 120 can only rotate counterclockwise (FIGURE 7) it follows that gear wheel 131, axle 126 and roll 117 can only rotate clockwise.

A horizontal bar 132 fastened to the lower ends of vertical bars 105, 106 of supporting frame A carries a gear rack 133 which meshes with gear wheel 119. A driving arm 134 attached to slide block 110 of slidable frame C projects beyond the side of supporting frame $A$ (FIGURE 8) and may be connected to any reciprocating
drive means (not shown) so that the entire slidable frame C suspended from slide rods 107, 108 of supporting frame A may be moved back and forth along rods 107, 108. When frame C moves to the right (FIGURE 7), gear wheel 119 turns clockwise but axle 123 and its associated elements are kept from rotating by pawl 122. However, when frame $C$ moves to the left, gear wheel 119 turns counterclockwise and pawl 125 engages ratchet 121 causing roll 118 and gear wheel 120 to rotate also counterclockwise and gear wheel 131 and roll 117 to rotaté clockwise.
Both contact rolls 117, 118 have a plurality of circumferential grooves which ride over two sets of stationary wires held horizontally at the nip between rolls 117, 118. The set of wires 135 which fit in the grooves of roll 117 are spot welded to bar 136 fastened to the lower ends of vertical bars $\mathbf{1 1 3}, \mathbf{1 1 5}$, while the set of wires 137 which fit in the grooves of roll 118 are spot welded to bar 138 also fastened to bars 113, 115.

A knife blade 139 is pivotally fastened to bar 113 of slidable frame C by spring-loaded bolt 140 . Blade 139 moves down across the sharp edge of cutting bar 141 so that ribbon R is severed between these two elements 139 , 141. Cutting bar 141 is positioned on the discharge side of contact rolls $\mathbf{1 1 7}$, 118 so that ribbon $R$ delivered by these rolls slides over bar 141 (FIGURE 11). A discharge apron 42 is fastened against the bottom of cutting bar 141 and serves to facilitate the laying down of ribbon $R$ in a smooth condition on a work area as slidable frame C moves toward the left (FIGURE 7) and contact rolls 117, 118 rotate to pay out or dispense ribbon R. Blade 139 has a lever arm 143 which is held up by spring 144 against the lower edges of slanted bar 145 attached to vertical bars 105,106 of supporting frame A. As frame C is moved to the right (FIGURE 7), arm 143 sliding along the lower end of bar 145 is thereby pushed downward with the result that blade 139 is raised and a springloaded latch 146 snaps over the top of lowered arm 143 to lock blade 139 in the raised position. When frame C moves toward the left (FIGURE 7), blade 139 remains raised until a stop 147 which is adjustably bolted to slide bar 107 trips latch 146 allowing blade 139 to snap down across the edge of cutting bar 141 because of the upward pull on arm 143 by spring 144 .
In the operation of the contact roll embodiment of the invention, tenuous ribbon $R$ from roll 28 is looped over idler roll 24, around idler roll 150 mounted on bar 103 of supporting frame $A$ and under idler roll 116 of slidable frame $C$. The leading end of ribbon $R$ is threaded between the two sets of wires 135,137 and through the nip between contact rolls 117, 118 so that the leading end of ribbon $R$ lies along the sharp edge of cutting bar 141 (FIGURE 11). Starting with slidable frame C at the end of its travel toward the right, the reciprocating drive means (not shown) acting on arm 134 pulls frame C toward the left (FIGURE 7) and during this movement knife blade 139 is held in the raised position by spring-loaded latch 146 while gear rack 133 acting on gear wheel 119 causes roll 118 to rotate counterclockwise and roll 117 clockwise with the result that ribbon $\mathbf{R}$ is discharged toward the right by contact rolls 117, 113 (FIGURE 7) as frame C travels toward the left. When frame C comes to the end of its travel to the left, stop 147 trips latch 146 and knife blade 139 swings down across the sharp edge of cutting bar 141 thereby severing ribbon R. Frame C then commences its return travel to the right with the result that gear wheel 119 rotates clockwise on gear rack 133 while contact rolls 117,118 hold ribbon $R$ therebetween without rotating. During the travel of frame $C$ toward the right, ribbon $R$ is being pulled from roll 28 over idler rolls 24 , 150, 116 and slanted bar 145 on frame A is lowering lever arm 143 thereby raising blade 139. At the end of the movement of frame $C$ to the right, latch 146 snaps over arm 143 to hold blade 139 in the raised position and the
unrolling of ribbon roll 28 stops. Frame $C$ then repeats its movement to the left as already described.

The work area in which each ribbon segment is deposited in a smooth, wrinkle-free condition in accordance with this invention may comprise various mechanisms for the further handling or utilization of the ribbon segments. For instance, referring to the contact roll machine, a conveyor belt may be positioned under slidable frame $\mathbf{C}$ to receive each ribbon segment as it is dispensed by the machine and to convey it in a direction at right angles to the movement of the slidable frame C. The operation of such a conveyor belt would be controlled through known mechanical or electrical devices that in response to movements of the contact roll machine would set the conveyor in motion while slidable frame C is traveling toward the right (FIGURE 7) and would stop the conveyor while frame C is traveling toward the left and is depositing another ribbon segment on the conveyor. Similarly, part of a rotatable table or turret may lie under frame C to receive each dispensed ribbon segment; after the deposition of each ribbon segment, the turret revolves and carries the deposited ribbon segment away from under the contact roll machine to a new work locus. As an example of such operation with ribbon segments of tobacco sheet material, each segment conveyed by a belt or turret from under the contact roll machine to a new work locus would there be picked up as a cigar binder by a vacuumized or suction binder carrier (such as shown in U.S. Patent $1,543,874$ ) and transported to and laid on the chianti belt of a bunch-rolling mechanism of the type commonly used in cigar-making machines.
It is frequently advisable that the work area on which the ribbon segments are deposited pursuant to this invention have a perforated surface communicating with a subjacent suction box. In this way, the ribbon issuing from the dispenser of this invention will adhere to the perforated surface immediately upon contacting the same and will be held there in a smooth, wrinkle-free condition until the deposited ribbon segment is utilized or transferred to a new work locus. Obviously, when the ribbon segment is about to be utilized or removed from the perforated surface, adherence of the ribbon segment thereto will be overcome by temporarily breaking the suction in the subjacent box.

Various modifications of the invention will be apparent from the foregoing disclosure. For instance, bracket 18 which holds the spool of ribbon does not need to be mounted on supporting frame A and may have an independent pedestal. This is also true of stop 147 which is illustrated in FIGURE 7 as being attached to slide bar 107. Also, the vacuum roll machine may be altered to omit the vertical movements obtained through the incorporation of movable frame B and its associated elements like cam lever 47; in such case, the fixed knife blade 91 would be replaced by one which moves up and strikes the underside of casing 82 when frame $C$ completes its movement to the left (FIGURE 1) and then drops away from casing 82 when frame $C$ starts its movement to the right.

In view of the many possible modifications and variations of the invention which will occur to those skilled in the art without departing from the spirit or scope of the invention, only such limitations should be imposed as are indicated by the appended claims.

## What is claimed is:

1. A machine for dispensing a continuous, tenuous ribbon in the form of ribbon segments of predetermined length, which comprises a fixed, supporting frame, shuttle means mounted on said supporting frame and adapted for reciprocating motion relative to said supporting frame with a linear amplitude substantially equal to said predetermined length, roll means attached to said shuttle means and rotatably driven by the movement of said shuttle means in one of the two directions of said reciprocating motion, holding means attached to said shuttle means to
maintain said ribbon in contact with said roll means, and cutting means operative to cut a ribbon segment from said ribbon at the end of the movement of said shuttle means in said one of the two directions of said reciprocating motion during which said roll means rotates.
2. The machine of claim 1 wherein the roll means has a cylindrical shell provided with a plurality of apertures in its surface and the holding means comprises a compartmentalizing element in said cylindrical shell providing fluid communication between a portion of said apertures and a vacuum source.
3. The machine of claim 1 wherein the holding means comprises a roll disposed adjacent and parallel to the roll means in order to hold the ribbon in the nip between said roll and said roll means.
4. A machine for dispensing ribbon segments of equal length from a roll of a tenuous ribbon, which comprises spool means to hold said roll of tenuous ribbon, a fixed, supporting frame, shuttle means mounted on said supporting frame and adapted for reciprocating motion relative to said supporting frame with a linear amplitude substantially the same as the desired equal length of said ribbon segments, roll means rotatably mounted on said shuttle means, a gear mechanism associated with said roll means translating the reciprocating motion of said shuttle means into periodic, unidirectional rotation of said roll means, holding means attached to said shuttle means to maintain said ribbon in contact with said roll means, and cutting means operative to cut a ribbon segment from said ribbon at the end of each periodic unidirectional rotation of said roll means.
5. The machine of claim 4 wherein the gear mechanism comprises a gear rack associated with said supporting frame and a gear wheel mounted on said shuttle means in engagement with said gear rack.
6. The machine of claim 5 wherein the roll means has a cylindrical shell provided with a plurality of apertures in its surface and the holding means comprises a compartmentalizing element in said cylindrical shell providing fluid communication between a portion of said apertures and a vacuum source.
7. A machine for dispensing ribbon segments from a roll of a tenuous ribbon, which comprises a stationary bracket with rotatable spool means for holding said roll of ribbon, shuttle means which reciprocates in directions away from and toward said bracket, roll means carried by said shuttle means adapted to hold the leading end of said ribbon without rotating while said shuttle means moves in one of its two reciprocating directions, said roll means being rotatably driven and thereby paying out said ribbon by the movement of said shuttle means in the other of its two reciprocating directions, and cutting means responsive to the reciprocation of said shuttle means which cuts a ribbon segment from said ribbon at the end of each movement of said shuttle means during which said roll means rotates.
8. The machine of claim 7 wherein the roll means comprises a pair of geared contact rolls through the nip of which contact rolls said ribbon passes.
9. The machine of claim 7 wherein the roll means comprises a hollow cylindrical casing with a perforated surface, a tube concentrically disposed in said casing and providing bearings for the rotation of said casing about said tube, partitioning means in the annular space between said casing and said tube to divide said annular space, and an aperture in said tube providing fluid communication between a division of said annular space and the interior of said tube.
10. The machine of claim 9 wherein the cutting means comprises a fixed knife blade positioned to contact the surface of said casing at the end of each movement of said shuttle means during which said roll means rotates.
11. The machine of claim 7 wherein said rotatable spool means is provided with a brake which is released in response to a pulling action on said ribbon developed
by said shuttle means when said shuttle means moves in a direction away from said bracket.
12. The machine of claim 7 wherein the cutting means is mounted on said shuttle means and comprises a fixed cutting bar and a knife blade pivotally held in scissorslike relation to said cutting bar.
13. A machine for dispensing a continuous, tenuous ribbon in the form of ribbon segments of predetermined length, which comprises a fixed, supporting frame, shuttle means mounted on said supporting frame and adapted for reciprocating motion relative to said supporting frame with a linear amplitude substantially equal to said predetermined length, roll means attached to said shuttle means and rotatably driven by the movement of said shuttle means in one of the two directions of said reciprocating motion, a hollow casing with a perforated surface to hold said ribbon when a vacuum is drawn in said hollow casing, said hollow casing being attached to said shuttle means for reciprocating motion therewith, and a cutting blade supported independently of said shuttle means and positioned to cut a ribbon segment from said ribbon toward the end of said movement of said shuttle means during which said roll means is rotatably driven.
14. In a cigar machine having a station for suctionally supporting a portion of tobacco sheet material to be wound on a smoking article, a source of tobacco sheet web material mounted adjacent said station, means movable to and fro across said station, said means having mounted thereon gripping elements to grip the leading edge of said web of sheet material and draw it across said station, means to release said gripping elements whereby said leading edge is released, and said means carrying said gripping elements may be moved backward, and cutting means mounted adjacent said gripping elements to sever a portion of said web during the return stroke of said movable means.
15. In a cigar machine having a rolling table, the combination with a source of continuous tobacco web, of gripping means movable from said source across said table to draw a portion of said web across said table, means to release said gripping means so that said gripping means may return toward said source, and cutting means operatively mounted on said gripping means to sever said drawn portion of web from said continuous source.

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16. In a cigar machine having a station adapted to receive a portion of tobacco sheet material, a support mounted to move to and fro across said station, a source of tobacco sheet material adjacent said station and said support, gripper means on said support to grip the leading edge of said material to draw it across said station, means to release said gripper means so that said leading edge is released and said support may be moved backward along said drawn portion of material, and cutting means on said support operative to sever said drawn portion of web during the return trip of said support.
17. In a cigar machine having a suctional rolling table, means for applying suction at predetermined time intervals to said rolling table, a source of sheeted tobacco web material adjacent said rolling table, a support movable across said rolling table, cooperating feed rollers mounted for rotation on said support, said feed rollers adapted to grip therebetween the leading edge of said web, said support then moving across said table to draw a portion of said web, said feed rollers then rotating and said support moving backward across said web at a rate of speed substantially equal to the peripheral speed of said rollers to deposit a leading portion of said web on said rolling table, and a knife mounted on said support adjacent the delivery end of said feed rollers and operative to sever said web when said support is returned to a predetermined position whereby a predetermined leading portion of web may be severed and deposited on said rolling table.

References Cited in the file of this patent

## UNITED STATES PATENTS

| 299 | M |
| :---: | :---: |
| 952,845 |  |
| 1,011,127 | Lacroix _-_---.-.-.-.--- Dec. 5, 1911 |
| 1,197,865 | Shields _--------------- Sept. 12, 1916 |
| 1,838,200 | Tomtlund _-----.-.-.-.- Dec. 29, 1931 |
| 1,849,005 | Grover --.-.-.-.-.-.-...- Mar. 8, 1932 |
| 1,904,870 | Laycock _....-.-.-.-...- Apr. 18, 1933 |
| 2,316,785 | Gladeck -------------- Apr. 20, 1943 |
| 2,446,305 | Sandberg ------------ Aug. 3, 1948 |
| 2,480,721 | Egenolf et al. ---------- Aug. 30, 1949 |
| 2,501,334 | Hubelmeyer .---.-...-. Mar. 21, 1950 |
| 2,539,372 | Metzler _-_-_--...-...... Jan. 23, 1951 |
| 2,586,536 | Feb. 19, 195 |

