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Hays et al.

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[45] **Apr. 2, 1974**

[54] **DEVICE FOR STRETCHING A SHEET OR STRIP OF MATERIAL**

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[73] Assignee: **AMF Incorporated**, White Plains, N.Y.

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[52] **U.S. Cl.** ..... **131/147 R**, 131/123, 198/184

[51] **Int. Cl.** **A24b 5/04**, A24b 5/14

[58] **Field of Search** ..... 131/123–125, 131/147 R, 148; 198/184, 202

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Assistant Examiner—John F. Pitrelli
Attorney, Agent, or Firm—George W. Price; Charles J. Worth

[57] **ABSTRACT**

A method of smoothing tobacco leaf elements or the like, comprising the steps of driving each periphery of a cylindrical, perforated, stretchable band about axes inclined to the axis of the cylinder, the angles of inclination being of opposite senses, to stretch the band laterally from a first dimension to a second, larger, dimension and back to the first dimension during each revolution of the band, conveying a succession of tobacco leaf elements to the band at a point in its path prior to said lateral second dimension, applying subatmospheric pressure to the interior of the band to transfer the tobacco leaf elements from the conveyor to the band at said point and secure the leaf elements to the band as it stretches to smooth the leaf held thereon, and removing the tobacco leaf elements from the band at a point on the band closer to the second dimension than the point thereon the leaf was transferred thereto.

9 Claims, 9 Drawing Figures

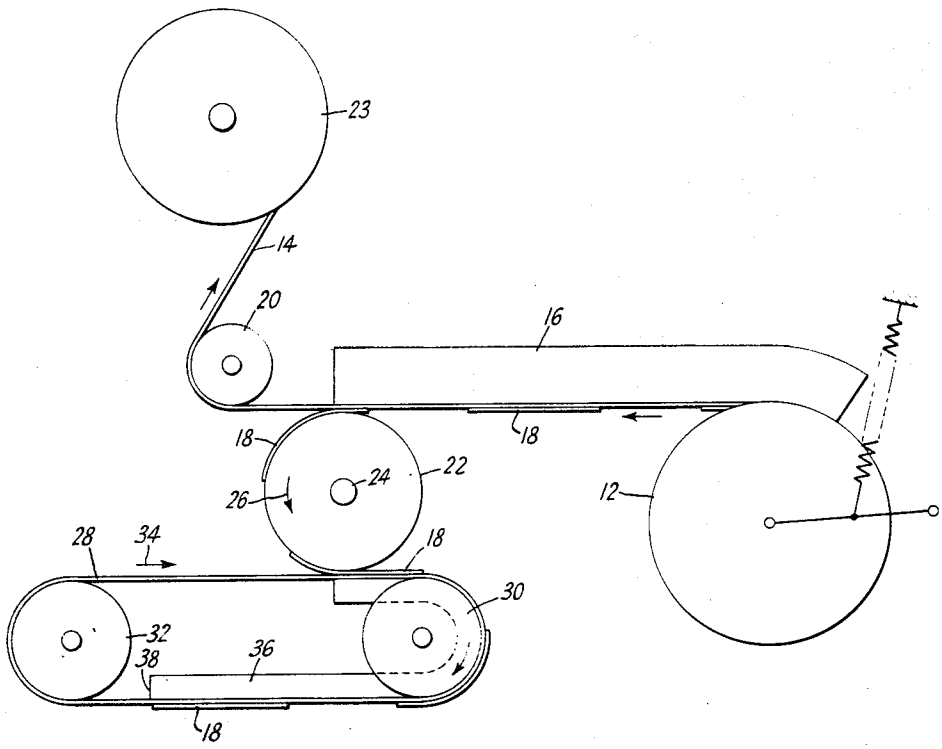


FIG. 1

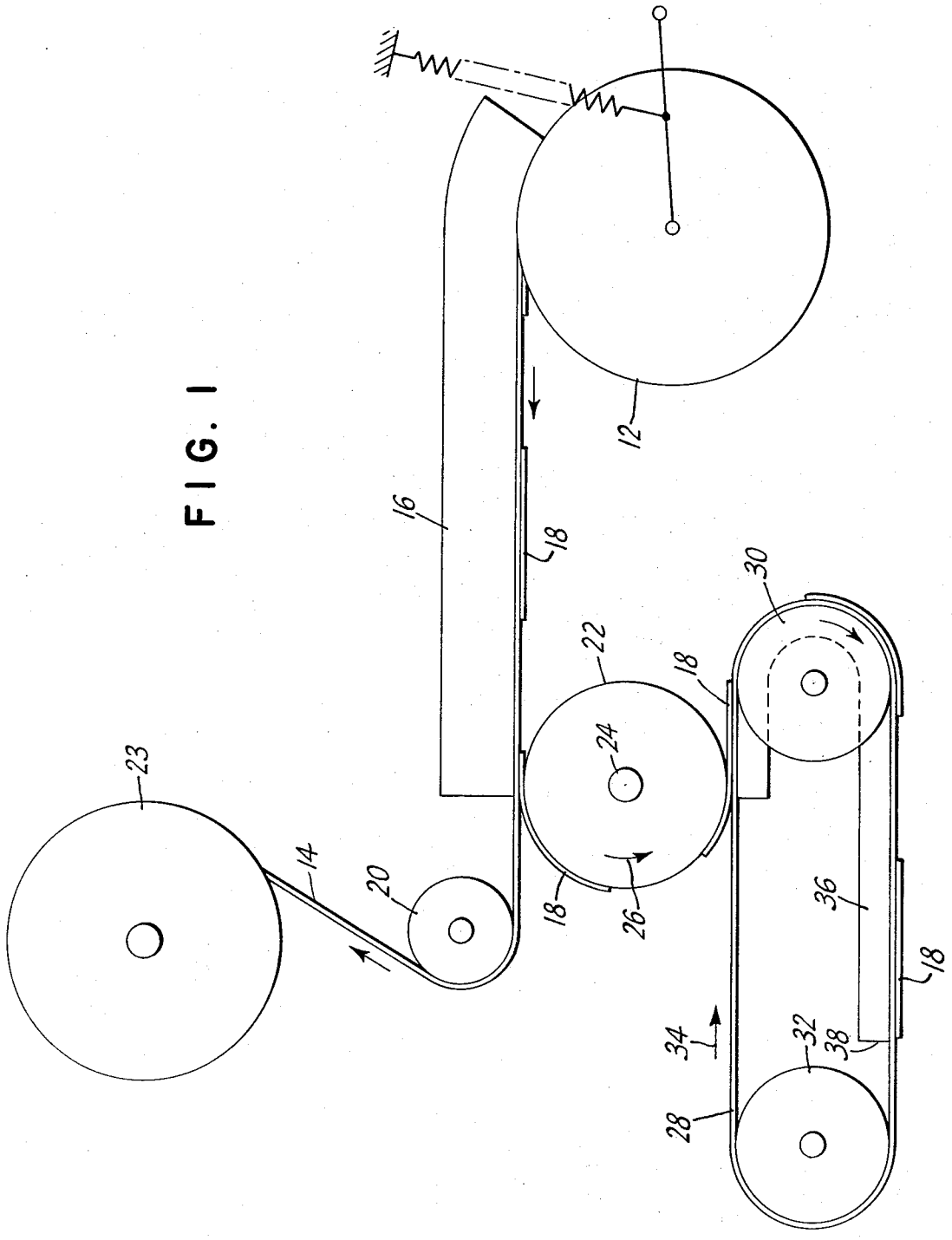
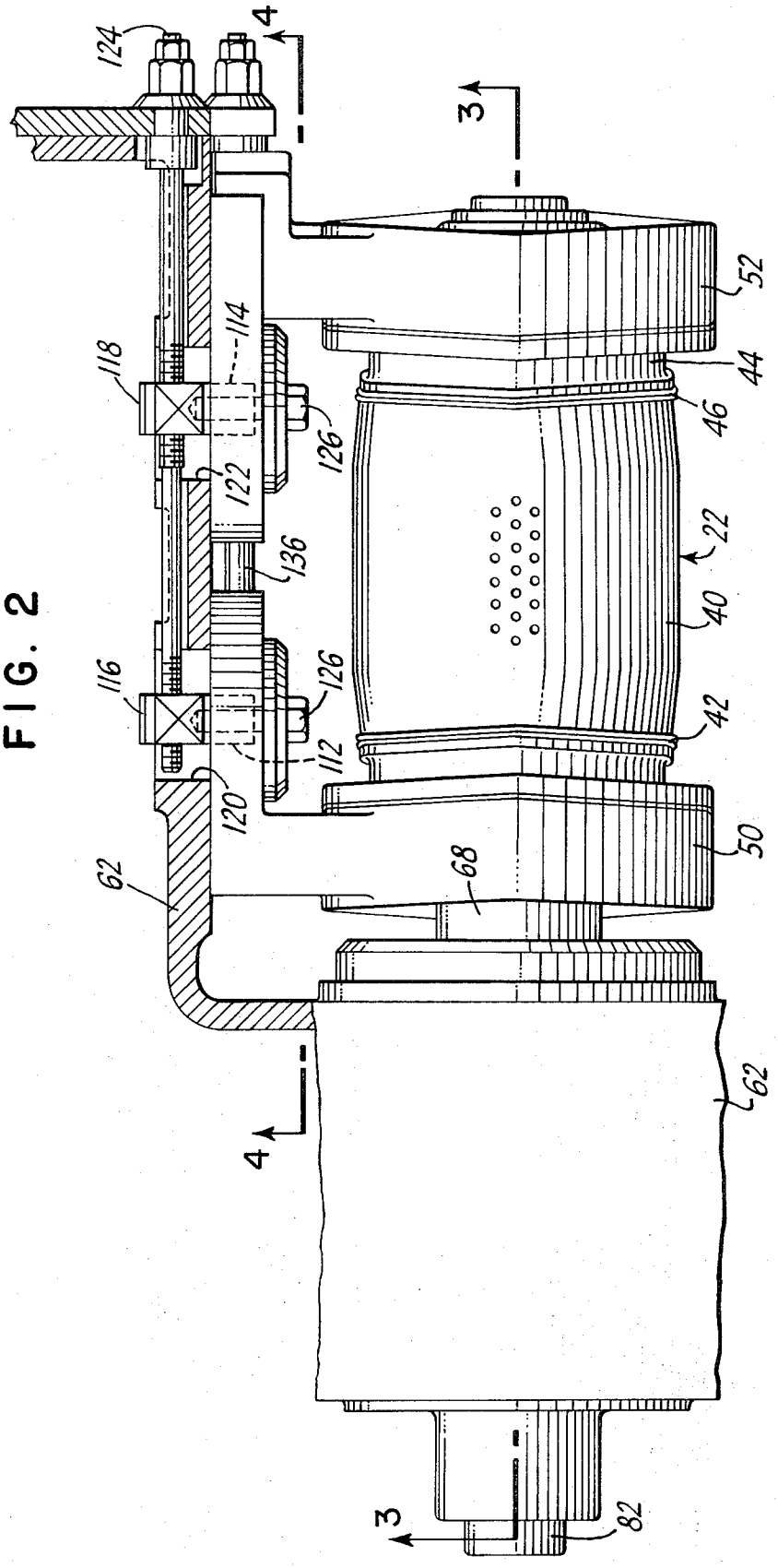


FIG. 2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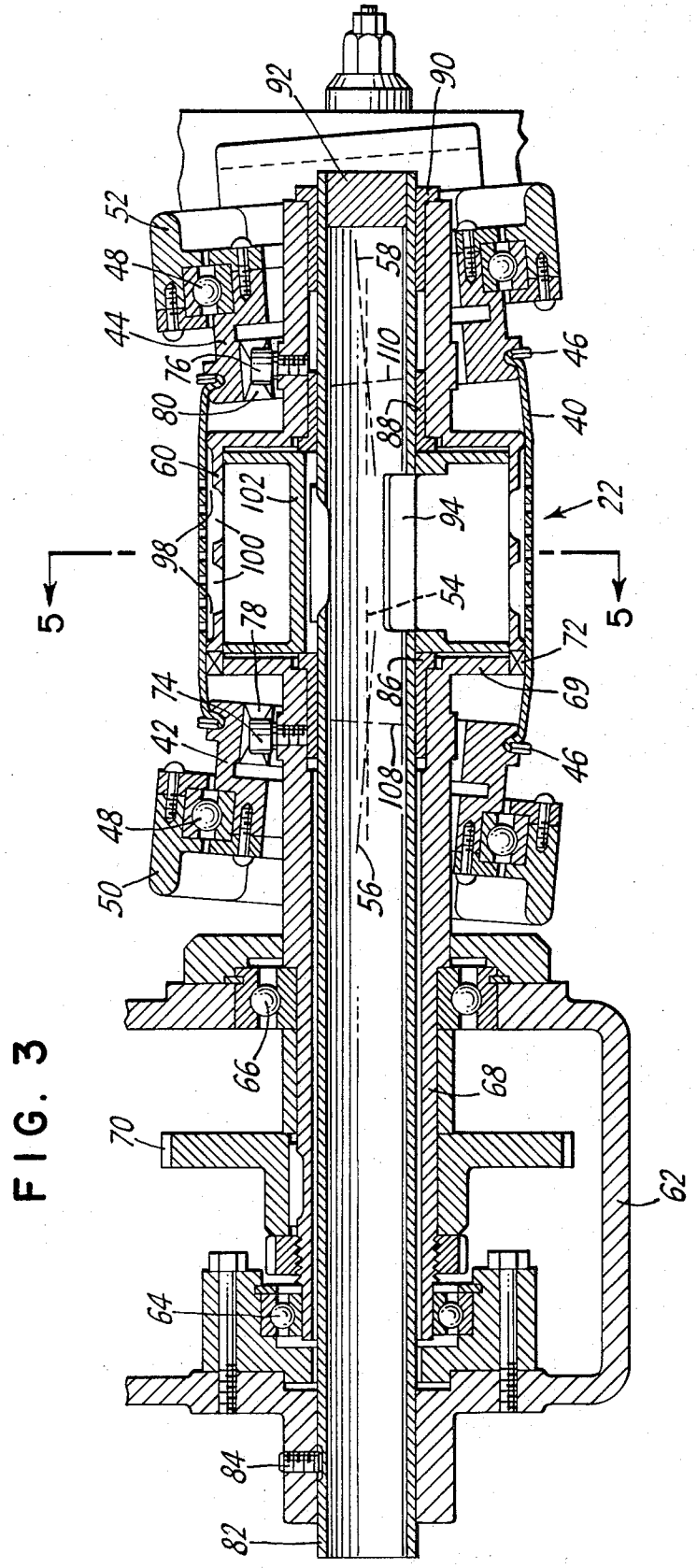
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FIG. 3

FIG. 4

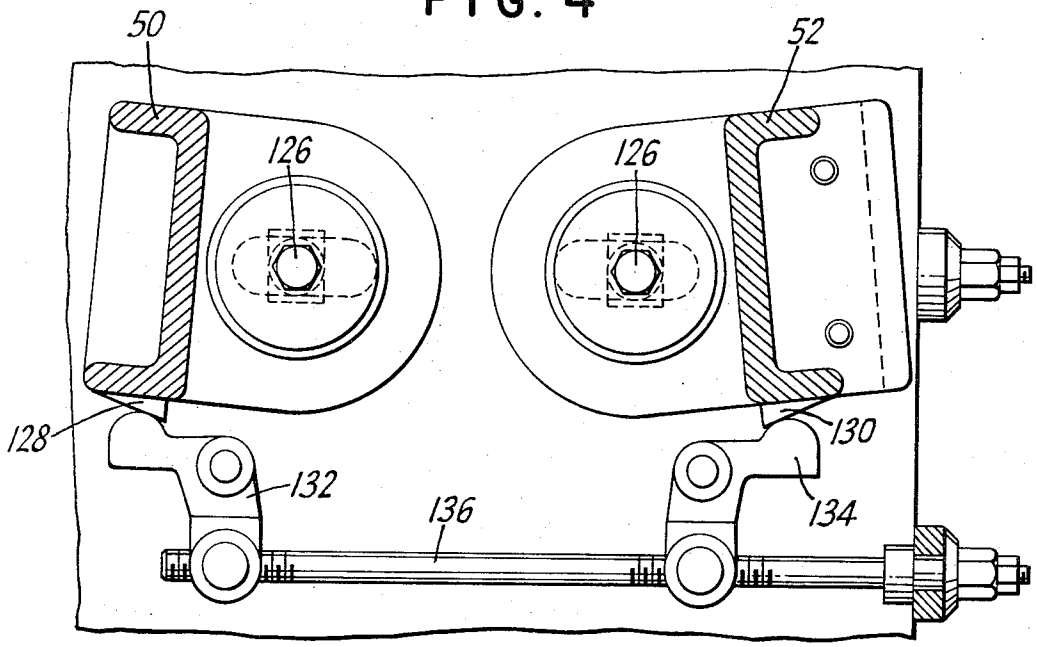


FIG. 5

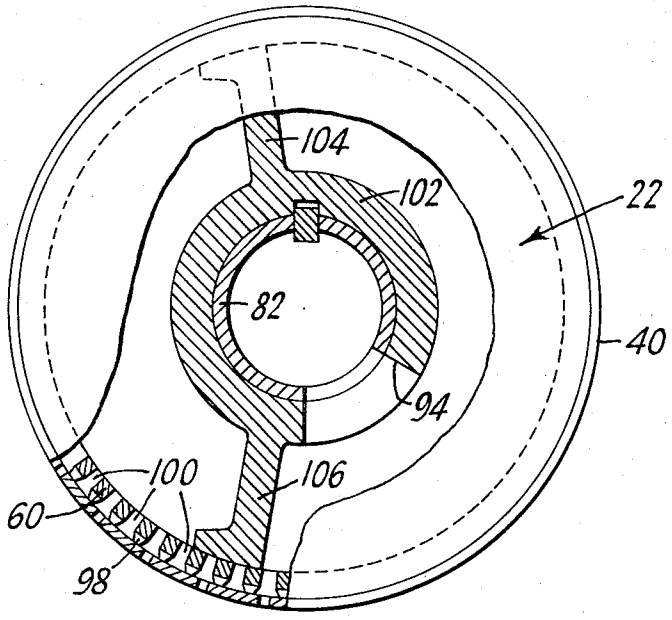


FIG. 6

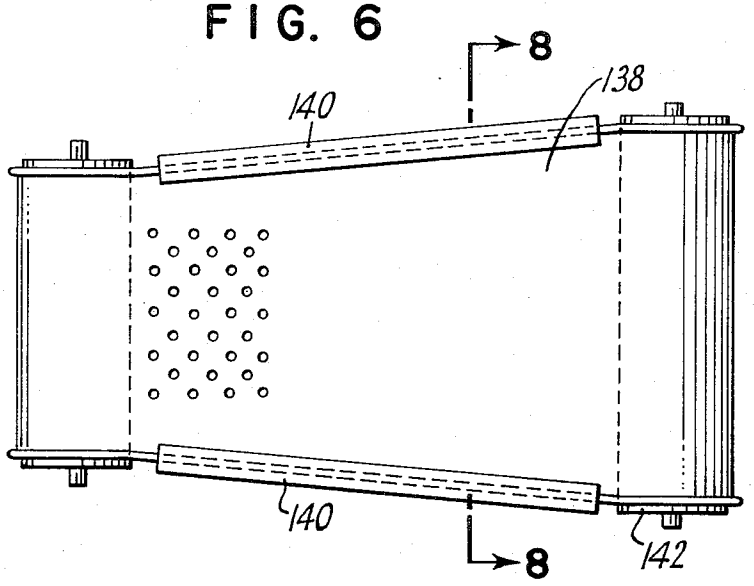


FIG. 7

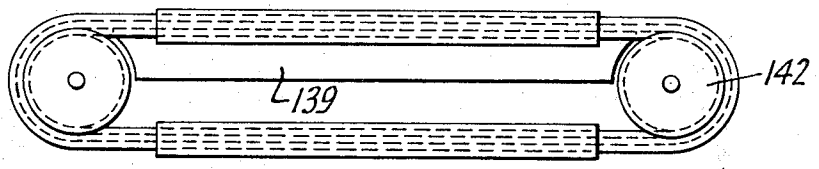


FIG. 8

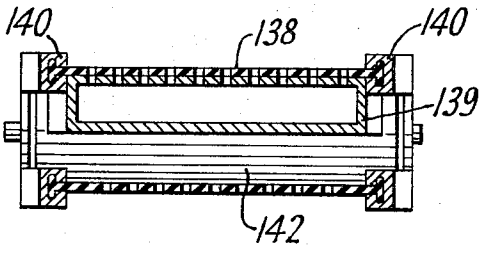
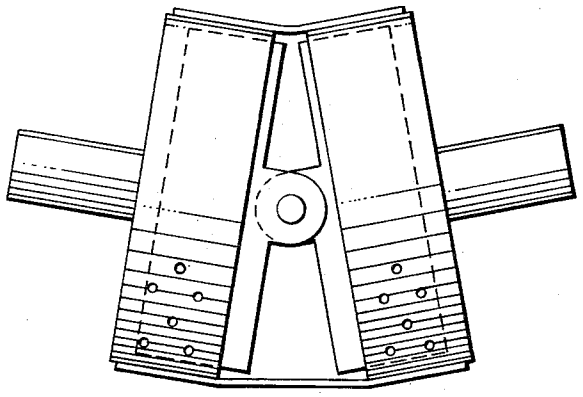


FIG. 9



DEVICE FOR STRETCHING A SHEET OR STRIP OF MATERIAL

BACKGROUND

This invention relates generally to the processing of tobacco leaves and more particularly to apparatus for smoothing a sheet or strip of tobacco by pulling it in a dimension along the plane of the sheet or strip of tobacco while it is being transported from a source of supply to a point of further manipulation or processing.

In this invention structure is provided for smoothing tobacco leaves or leaf parts which are to be used for wrapping cigars wherein the leaf is utilized either as the binder of a quantity of tobacco to form what is known as a cigar bunch or as the secondary wrapper, commonly referred to as the wrapper and which is wrapped around a cigar bunch to form a finished cigar. Currently, tobacco leaves which are to be used as either a binder or wrapper are handled and stretched flat manually.

Actually, in the manufacture of a cigar, a tobacco leaf or part of a tobacco leaf is usually stretched twice, once when the leaves are being assembled into books and, second, when the wrapper or binder is being positioned onto a die for cutting to the shape desired for wrapping.

Tobacco plant leaves, which is a natural product, contains many pleats, wrinkles and folds that are present in a completely random manner. In the generally accepted mode of cigar manufacture, those leaves which are destined to be used as binders or wrappers of cigars are first moistened to make then suitably pliable. The leaves are then stretched and ironed out by hand to remove substantially all of the pleats, folds, creases and the like. They are then fed, one at a time, onto the rotating drum of a booking machine which advances the leaf longitudinally in the direction of its coarse mid rib so that they are laid around the drum with the mid rib of each leaf circumferentially positioned normal to the axis of the drum. As the drum rotates, the leaves move past a pair of knives which sever the mid rib from the leaf, leaving the two separate halves of each leaf on the drum where they are held by suitable means. The mid rib is discarded. This operation is repeated again and again, each succeeding half leaves being deposited on top of the previously processed leaves on the drum to form two separate piles; one of the right hand half portions of the leaves and the other of the left hand half portions of the leaves. When the two piles become as high as can be conveniently accommodated on the drum, they are removed, each pile being referred to as being in "booked" formation. The process is then again repeated and additional "books" are formed.

It should be noted that while each leaf is manipulated and stretched to flatten and remove all of the pleats, folds and creases, no step is taken to maintain any stress on the leaf. Consequently, the booked leaf halves are generally flat, but still contain a number of minor undulations and may even contain small creases. Any stretching of the leaf which may have occurred up to this point is incidental to the flattening process, and no steps are usually taken to maintain the leaf in a stretched condition.

The leaf is stretched a second time at the cigar making machine. Here, the machine operator takes a half

leaf from the top of the booked pile of half leaves and stretches it over a shaped die to cut from the half leaf a blank having the required peculiar shape and size suitable for being spirally wrapped around the cigar. Generally, cigars must be produced with a smooth even wrapper that is completely free of wrinkles, creases and the like. To produce this result the leaf shape wrapped around the cigar must deliberately be held in a stretched condition up to the point of wrapping so that as the leaf contracts when the stretching stress is removed as it is being wrapped, it contracts or shrinks the cigar bunch to produce a tight smooth uniform wrap which is very necessary if air channels and consequent uneven burning are to be avoided. The flattening of the leaf inevitably results from stretching, however, one of the main reasons for stretching the leaf blank or cut-out is to make sure that it will shrink tightly around the cigar bunch.

The cigar machine is constructed with suitable perforated surfaces positioned both inside and outside of the die shape, each of the perforations being connected to a source of vacuum. When the operator places the leaf over the die, vacuum is applied through the perforations to cause the leaf to adhere to the perforated surfaces. The degree of adherance of the leaf to the perforated surface is proportional to the applied vacuum. To stretch the leaf, the operator drags the leaf across the perforated surfaces, this motion being part of the motion required to correctly position the leaf relative to the die. As the leaf is dragged across the perforated surface and captured by the perforated surfaces, it is placed under tension by an amount determined by the amount of vacuum. The operator takes care to stretch the leaf in two dimensions on the die so that the result is a completely stretched wrinkle free sheet which remains stretched and under stress even when the operator releases his hold on the leaf. The cigar machine is so constructed that the leaf is held under suction in a stretched state right up to the moment that it is applied to the cigar.

It will be seen that this method of cigar making entails a considerable amount of hand labor which is not only expensive but which limits the speed of operation of the machine.

Accordingly, the whole process can now be done automatically with the method and apparatus disclosed in U.S. Pat. application Ser. No. 77,135, now U.S. Pat. No. 3,699,973, entitled "Tobacco Leaf Condition" by Frank Hollenton. In U.S. application Ser. No. 77,135 the leaf is handled once only and on machinery which can be separate from the cigar maker, so that the speed limitations of one does not affect the speed of the other.

In U.S. application Ser. No. 77,135 there is disclosed a method and apparatus which relates to the automatic unraveling and flattening of a leaf of tobacco.

A tobacco leaf is fed into a conditioning chamber where the leaf is unraveled and extended to its full size and shape. The conditioning chamber can comprise two substantially parallel plates spaced from each other and between which is positioned a leaf holding means which can grip and hold the leaf along its stem. Air is moved transversely across the leaf from its stem outward to its edges.

The movement of the air across the tobacco leaf from its stem outward while the leaf is held or constrained by

its stem causes the leaf to flutter, to become unraveled, and to be extended to its full size and shape.

Thereafter, the leaf is further flattened and stretched in a stretcher-flattener.

The tobacco leaf stretcher-flattener comprises a relatively wide air permeable main belt positioned beneath two divergent air permeable belts. The two divergent belts are driven at substantially the same rate of speed, and the main belt is driven at a rate of speed that can vary somewhat from the speed of the divergent belts.

Individual suction chambers are positioned to cooperate with and effect a controlled flow of air through specific defined areas of each of the various belts.

The unraveled and extended leaf from the conditioning chamber is fed to and pneumatically captured by the advancing relatively wide air permeable main belt and carried to a position beneath the two divergent belts where the leaf is then released from the relatively wide main belt and captured pneumatically by the two divergent air permeable belts.

Each of the divergent belts pneumatically capture a portion of the tobacco leaf by means of a source of suction acting through the divergent air permeable belts. A portion of the right hand side of the leaf is pneumatically captured by one belt, and a portion of the left hand side of the leaf is pneumatically captured by the other belt. The movement of the belts along their divergent paths causes the leaf pneumatically captured by the belts to be stretched. Thereafter, the leaf is transferred from the divergent belts back to the relatively wide air permeable main belt where it is held or captured in its stretched unwrinkled form.

SUMMARY

In this invention there is disclosed apparatus and method for smoothing and stretching automatically a tobacco leaf or a part of a tobacco leaf. The leaf, or portion of the leaf that is to be stretched is suctionally gripped by a stretchable member with a force that is sufficient to prevent the leaf from slipping or sliding relative to the stretchable member. A force is then applied to the stretchable member to increase its area by stretching and, as there is no slippage between the leaf and the stretchable member, the portion of the leaf gripped by the stretchable member is also increased or stretched. Thus, if the stretchable member is designed to stretch uniformly over its entire area in response to an applied force, the leaf gripped by the stretchable member will also increase uniformly over its entire area, even in those instances where variations in resistance to stretching may exist in the leaf. Alternatively, the stretchable member can be designed to stretch by different amounts in different areas of its surface. For example, the stretchable member can be made of a sheet of rubber of variable thickness. Thus, the leaf spring gripped by the rubber sheet of variable thickness would extend or be stretched more in some areas than in others as the rubber sheet is stretched.

There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated. There are, of course, additional features of the invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which this disclosure is based may readily be utilized as the basis for the design of other structures for carrying out the several features and purposes of the invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of the invention. The invention itself, however, both as to its organization and method of operation, as well as additional objects and advantages thereof, will best be understood by the following description when read in connection with the accompanying drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagramatic view, in elevation, of a leaf strip feeding apparatus positioned relative to structure for stretching received strips of tobacco in accordance with the principles of this invention;

FIG. 2 is a plan view of structure in accordance with the principles of this invention;

FIG. 3 is a view along the line III—III of FIG. 2;

FIG. 4 is a view along the line IV—IV of FIG. 2;

FIG. 5 is a view along the line V—V of FIG. 3;

FIG. 6 is a plan view of another embodiment of structure in accordance with the principles of this invention;

FIG. 7 is a view, in elevation, of the structure of FIG. 6.

FIG. 8 is a view along the line VIII—VIII of FIG. 6; and

FIG. 9 is a plan view of still another embodiment of structure in accordance with the principles of this invention.

Similar reference numerals refer to similar parts throughout the several views of the drawing.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring specifically to FIG. 1, there is illustrated a diagramatic view, in elevation, of a leaf strip feeding apparatus positioned relative to structure for stretching received strips of tobacco in accordance with the principles of this invention.

A storage bobbin 12, supports strips of tobacco leaf interleaved between layers of a foraminous tape 14. Bobbin 12 is rotatably mounted on a floating support so that the point where tape 14 unwinds from the bobbin 12 relative to a fixed point is constant and always in contact with the bottom surface of a suction box 16 having perforations in its bottom surface. The suction box 16 is coupled to a source of suction to draw air through perforations in the bottom surface of the suction box 16. As air is exhausted from the suction box 16, the atmosphere, in trying to enter the suction box 16 through the perforated bottom, presses the tape 14 and captured strips of tobacco 18 tightly against the perforated bottom surface of the suction box 16. Thus, the strips of tobacco are held flat against the bottom surface of the tape 14 and, as the tape is pulled across the bottom surface of the suction box 16, the strips of tobacco move with the tape. The tape 14 passes around roll 20 and rewound onto a second bobbin 23; and, the strips of tobacco 18 are stripped off of the tape 14 by the drum 22 which is rotatably supported by a shaft 24 and driven in the direction indicated by arrow 26. The longitudinal axis of shaft 24 is positioned at right angles to the path of travel of the tape 14, the width of the

peripherical surface of the drum **22** being slightly larger than the width of the tape **14**; and, the drum **22** is driven to have a peripherical speed substantially equal to the forward speed of the tape **14.** The peripherical surface of the drum is positioned to contact the bottom surface of the tape **14**; and the effect of the suction box **16** terminates on a line slightly downstream from the line of tangency of the tape **14** with the peripherical surface of the drum **22.**

The peripherical surface of the drum **22** supports a plurality of small diameter openings positioned completely around the drum. A source of suction is coupled to draw air into the drum **22** through the small diameter openings. Thus, slightly past the point of tangency of the peripherical surface of the drum with belt **14** and beyond the area of influence of the suction box **16,** the strip of tobacco ceases to be held against the bottom surface of the suction box **16** and is transferred to and captured by the peripherical surface of the drum **22.**

Actually, in practice, the leaf is subjected simultaneously to suction from both the suction box **16** and the drum **22** at the point where the strip of leaf is transferred from tape **14** to the surface of drum **22.** Thus, the leaf is actually gripped by the drum **22** before it is freed from the tape **14** to ensure that any elastic stretch which may be present in the leaf while it is on the surface of the tape is maintained within the strip of tobacco while it is being transferred to the drum **22.** As the strip of tobacco which is pneumatically held captive to the surface of the drum **22** travels in a counter clockwise direction with the drum **22,** it is stretched laterally a desired amount in a novel manner that is to be described. The stretching of the strip of tobacco is completed by the time the strip of tobacco has traveled around the drum 180° or to the lowest point of drum **22.** An air permeable or perforated belt **28** mounted on rollers **30, 32** is positioned to be tangental to and contact the surface of drum **22** at its lowest point. One or both of the rollers **30, 32** is driven to drive the belt **28** in the direction indicated by the arrow **34** at a speed that is equal to or slightly greater than the speed of the periphery of the drum **22.** A suction box **36** coupled to a source of suction is positioned within and contacts the inside surface of the belt **28** to draw air through belt **28.** Suction box **36** extends from a point just upstream of the point of contact of the belt **28** with the drum **22,** along the inside surface of the belt around the bend formed by the roller **30** and then along the inside bottom surface of the belt **28** to a point **38.** It is here noted that while many various types of structures can be used to draw or suck air through the belt **28** as it is moving around the roller, one such structure can be a roller **30** that is split and positioned on each side of the suction box **36.** In this instance, the width of the suction box **36** would be substantially equal to the width of drum **22;** and the width of the belt **28** would be greater than the width of the drum **22** to insure that the leaf is maintained captive.

As mentioned above, the stretching of the strip of tobacco is completed by the time the strip of tobacco has traveled to the lowest point of the drum **22.** The stretched strip of tobacco is then transferred from the drum **22** to the belt **28** by cutting off the suction through the drum **22** to the strip of tobacco and applying suction through belt **28** by means of suction box **36;** suction box **36** having a perforated surface in contact with the inside surface of belt **28.** By positioning baffles within the drum **22** to cut off the suction through the surface of the drum **22** to the strip of tobacco after, not before, suction is applied to the strip of tobacco through the belt **28,** the strip of tobacco is transferred from the drum **22** to the belt **28** in a stretched state or condition as the belt **28** grips the strip of tobacco in its stretched state and holds it in said state before the strip of tobacco is released from the drum **22.**

The drum **22** stretches a strip of tobacco in a direction that is at right angles to the direction of advance of the strip of tobacco around the drum **22.** In some instances, however, it may be desirable to stretch the strip of tobacco in the direction of travel around the drum **22.** To accomplish this, the surface speed of the periphery of the drum **22** can be made to be slightly greater than the surface speed of the tape **14** to effect a stretching of a strip of tobacco in a longitudinal direction while the strip of tobacco is being transferred from the tape **14** to the drum **22.** Additionally, if desired, the surface speed of the belt **28** can be greater than the speed of the periphery of the drum **22** to also effect a stretching of the strip of tobacco in the direction of travel of the leaf at the point of transfer.

It is to be noted that the drum **22** individually and alone, effects the stretching of a strip of tobacco along a plane of the strip of tobacco in a direction transverse to the path of travel of the leaf. Referring specifically to the drum, the strip of tobacco is suctionally locked to the surface of the drum, which is a stretchable member, with a force that is sufficient to prevent the leaf from sliding or slipping on the surface of the stretchable member. A force is then applied to the stretchable member to increase its area by stretching and, as the leaf is locked to and cannot move relative to the stretchable member, the leaf will stretch to follow the increase in area of the stretchable member. Thus, if the stretchable member is designed to stretch uniformly over its area in response to an applied force, the leaf locked to the surface of the stretchable member will also be stretched uniformly over its entire area even if the leaf has areas that are more or less resistant to being stretched.

Referring specifically to FIGS. **2** and **3,** there is illustrated the structure of the drum illustrated generally be reference numeral **22** of FIG. **1** and having a foraminous stretchable member peripherical surface for suctionally gripping a strip of tobacco and stretching said strip of tobacco a controllable amount along a single plane. In the FIGS. **2** and **3,** the stretchable member can be in the form of a cylinder or sleeve **40** of rubber or the like having a plurality of perforations. Each end of the cylinder is fastened to a rotatably mounted flange **42, 44** by means of suitable clamping means, such as spring rings **46.** Each flange **42, 44** is clamped to the inner race of ball bearings **48,** the outer race of each being carried by support brackets **50, 52** respectively which are mounted symetrically about the axis of the foraminous or perforate cylinder **40.** The cylinder rotates about an axis **54,** flange **42** rotates about an axis **56** that is angularly displaced relative to axis **54;** and flange **44** rotates about an axis **58** that is angularly displaced relative to axis **54.** As the assemblage of the cylinder **40** and the two flanges **42, 44** rotate through an angle of 180°; the cylinder **32** is stretched from a first or smaller dimension as shown at the top of FIG. **3** to a second or larger dimension as shown at the bottom of FIG. **3.** The cylinder **40** returns to its first or smaller di-

mension during the next 180° of rotation. As shown in FIG. 1, the leaves that are to be stretched are fed to the top of the perforated cylinder and removed in a stretched condition from the bottom of the cylinder. To prevent the perforated cylinder 40 from collapsing due to the vacuum that is applied to it internally to hold a leaf on to its outside surface and from the flattening effect of the angled driving flanges 42, 44 an inner cylinder 60 is provided which rotates simultaneously with the perforated cylinder 40 to provide full support for the cylinder 40 without moving relative to the cylinder 40 except for that movement due to the stretching of the perforated cylinder 40.

The complete assemblage of the cylinder 40, inner cylinder 60 and driving flanges 42, 44 is supported by the main frame 62 of the machine. The frame 62 supports two bearings 64, 66 which rotatably support a cylindrical sleeve 68 which is driven in timed relationship with other desired structure by means of gear 70. The sleeve 68 terminates in a flange 71 around the periphery of which is formed a succession of slots 72. Slots 72 engage a corresponding projection around cylinder 60 to form a continuous rotatable unit. This unit carries two rollers 74, 76 which engage in slots 78, 80 formed within flanges 42, 44 so that the assemblage is caused to rotate as a single unit, the drive to the angular disposition of flanges 42, 44 being accommodated by the slots 78, 80.

The interior of inner cylinder 60 is coupled to a source of vacuum through a stationary inner tube 82 fastened rigidly to the main frame 62 by means of a screw 84. The other end of tube 82 is supported by means of bushings 86, 88, 90 about which the assembly rotates concentrically. A plug 92 seals the end of tube 82 to permit a source of suction to be coupled through tube 82 to communicate directly through port 94 to the inside of cylinder 80. A stationary shoe 96 is keyed to the tube 82 to limit or define the area around the periphery of inner cylinder 60 through which suction is applied.

Referring to FIG. 5, the wall of cylinder 60 has on its outside surface a series of V grooves 98 which communicate with the inside of the cylinders by means of a series of slot shaped ports 100 which permits the applied suction to be fed to the stretchable member 40.

The rotating assemblage consisting of the cylinder 60 and the stretchable member 40 rotates about a supporting member 102, having two arms 104, 106 which slidably contact the inner surface of the inner cylinder 60. It will be appreciated that the amount of stretch applied to the cylinder 32 is controlled by the angles of the planes in which flanges 42, 44 rotate. To accommodate varying conditions, the angles of the flanges relative to sleeve 68 can be adjustable. The brackets 50, 52 are substantially "L" shaped and are supported by the main frame 62 as illustrated in FIG. 2. The brackets are positioned to pivot or swing about axis 108, 110 as they are adjusted for various angles. Holding members 112, 114 are an integral part of the "T" shaped blocks 116, 118 which are in turn positioned within slots 120, 122. The T shaped blocks 116, 118 are moved toward or away from each other by means of an adjusting screw member 124 having right and left had screw threads coupled to the blocks 116, 118. By slightly slackening the two screws 126, the adjusting screw member 124 may be turned to move the pivots of the holding member 112, 114 closer to or further from each other to obtain the desired initial tension in the stretchable member 40.

The amount of stretch that is applied to the leaf can be varied or changed by varying the angles of the flange carrying brackets 50, 52. Referring specifically to FIG. 4 the brackets 50, 52 pivot on shafts about axis 108, 110, the positioning of the brackets being determined by the wedge shaped surfaces 128, 130 in cooperation with the bell crank levers 132, 134. The positioning of the bell crank levers 132, 134 are controlled by turning a common shaft 136 having right and left hand screw threads. The initial tension present in the stretchable member 40 will, at all times, hold the wedge shaped surfaces 128, 130 in contact with the bell crank levers 132, 134; and, if the screws 126 are allowed to remain slightly loose, then the angular adjustment of the support brackets can be made while the machine is running to obtain the optimium setting.

The structure here illustrated and described can be adjusted to temporarily or periodically release the tension in the stretchable member during those instances when the machine is not in use, i.e., overnight or the like. The release of tension in the stretchable member is desirable during periods of non use as the tension within the stretchable member is variable around its circumference and, therefore, is desirable as most rubber like materials tend to become permanently deformed under such conditions. Accordingly, when the tension within the stretchable member is to be released, adjusting screw shaft 124 is rotated in a direction to move support brackets 50, 52 closer together until all of the tension in the stretchable member is released. The wedge shape surfaces 128, 130 are shaped to reduce the angles of the support brackets 50, 52 as they move closer together, there being no angular displacement in the totally released portion, and all of the parts being concentric about a common center axis. In addition, the total release of tension in the stretchable member is necessary to permit the stretchable member to be more easily changed or replaced when it becomes worn. In the structure here illustrated, the support brackets 50, 52 are made in two parts for easy dismantling. After fitting a new stretchable member or after relieving the stretchable member of tension, the single motion of turning the adjusting screw shaft 124 will both re-stretch the stretchable member 40 and simultaneously reset the support brackets 50, 52 to the desired angles by reason of the wedge shaped surfaces 128, 130.

Referring to FIG. 6, there is illustrated, in plan, a view of another embodiment of structure in accordance with the principles of the invention. In this embodiment the stretchable member is in the form of a belt rather than a cylindrical sleeve.

The belt 138 which is both stretchable and foraminous is mounted on two rollers 140, 142 coupled to be driven at a predetermined speed. A suction chamber 139 coupled to suck air through the upper surface of the belt 138 is positioned to be in contact with the inside top surface of the belt to cause leaves of tobacco to adhere without slipping on to the upper surface of the belt.

The edges of the foraminous stretchable belt 138 are shaped to have a rim or edge projections which engage rail members 140 (See FIG. 8) the rail members being positioned to diverge from each other in the direction of the movement of the belt to cause the foraminous

stretchable belt **138** to be stretched laterally as it progresses along from the top of one roller to the top of the other roller.

FIG. **9** illustrates still another embodiment of structure in accordance with the principles of this invention wherein two metal rollers, provided with internal suction, are mounted at a suitable angle to laterally stretch leaf fed on to and pneumatically locked to the roller at their closest point while traveling to the most distant point. In this instance, it should be noted that a foraminous stretchable belt is not required.

Having now fully set forth both structure and operation of preferred embodiments of the concept underlying the present invention, it may be that various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will occur to those skilled in the art upon becoming familiar with said underlying concept. All such embodiments, variations, and modifications as incorporate the spirit of the invention and depend upon its underlying concept are consequently to be considered as within the scope of the claims appended herebelow, unless the claims by their language expressly state otherwise.

We claim:

1. Apparatus for smoothing tobacco leaf elements and the like, which comprises:

a pair of opposed support members,

a stretchable endless band having a pattern of apertures therein,

means for securing the stretchable endless band to said support members,

means for driving said support members to rotate the stretchable band about an axis,

means for mounting said opposed support members to rotate about axes inclined to the axis of rotation of the stretchable members such that the stretchable member is stretched from a first dimension to a second, larger, dimension and back to the first dimension during each revolution thereof,

means for applying subatmospheric pressure to the stretchable band, and

means for feeding tobacco leaf elements to the stretchable band between its first and second dimensions and removing them from the band at or adjacent the second dimension, the tobacco leaf elements adhering to the band due to the subatmospheric pressure and being smoothed as the band stretches and the apertures separate.

2. Apparatus according to claim **1**, further comprising a cylindrical support member mounted interior of the cylindrical band to preclude the collapse thereof under the subatmospheric pressure applied thereto.

3. Apparatus according to claim **1**, wherein the stretchable endless band is cylindrical and the support members are circular in cross section.

4. Apparatus according to claim **1**, further comprising means for adjusting the mounting means for the support members to vary the angle that the axes of the supports are inclined to the axis of rotation of the endless band.

5. Apparatus according to claim **1**, wherein the means for feeding tobacco leaf elements to the stretchable band includes a conveyor belt for carrying tobacco leaf elements, means positioning a portion of the conveyor belt tangent to the stretchable member and means for transferring tobacco leaf elements from the conveyor belt to the stretchable member at the area of tangency.

6. Apparatus according to claim **1**, further comprising means for removing smoothed tobacco leaf elements from the stretched endless band.

7. Apparatus according to claim **6**, wherein said means for removing smoothed tobacco leaf elements includes passing a conveyor tangent to the endless band adjacent the portion of its travel whereat it is at its point of maximum stretch, removing the subatmospheric pressure from the endless band at the area of tangency, and applying subatmospheric pressure to the conveyor belt past the area tangency to transfer the smoothed leaves from the endless band to the conveyor belt.

8. Apparatus according to claim **7**, further comprising means for adjusting the mounting means for the support members to vary the angle that the axes of the supports are inclined to the axis of rotation of the endless band.

9. Apparatus according to claim **8**, further comprising means for removing smoothed tobacco leaf elements from the stretched endless band.

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