March 27, 1962 O. E. EISSMANN 3,026,878

METHOD AND APPARATUS FOR CIGARETTE ROD FORMING

Filed Aug. 30, 1957 2 Sheets-Sheet 1

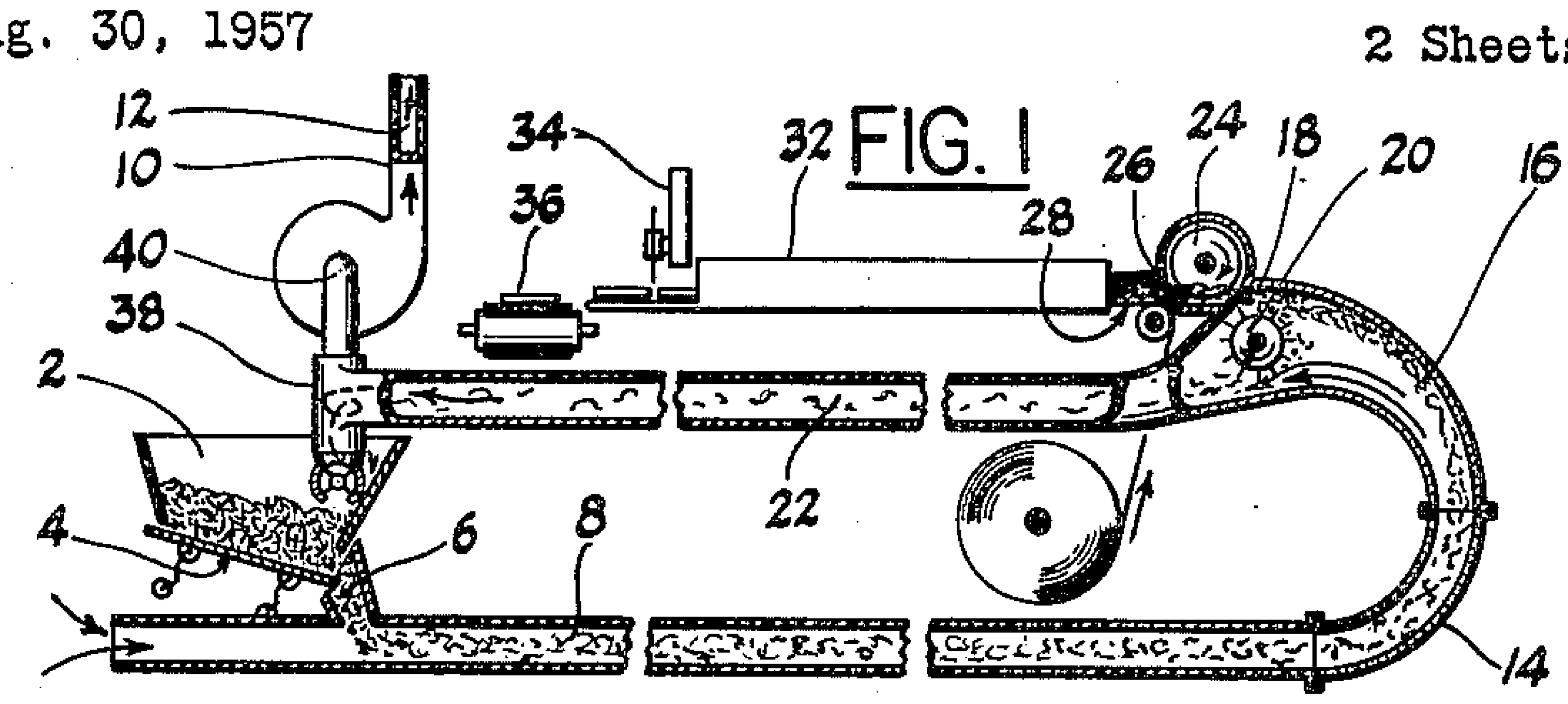

FIG. 1

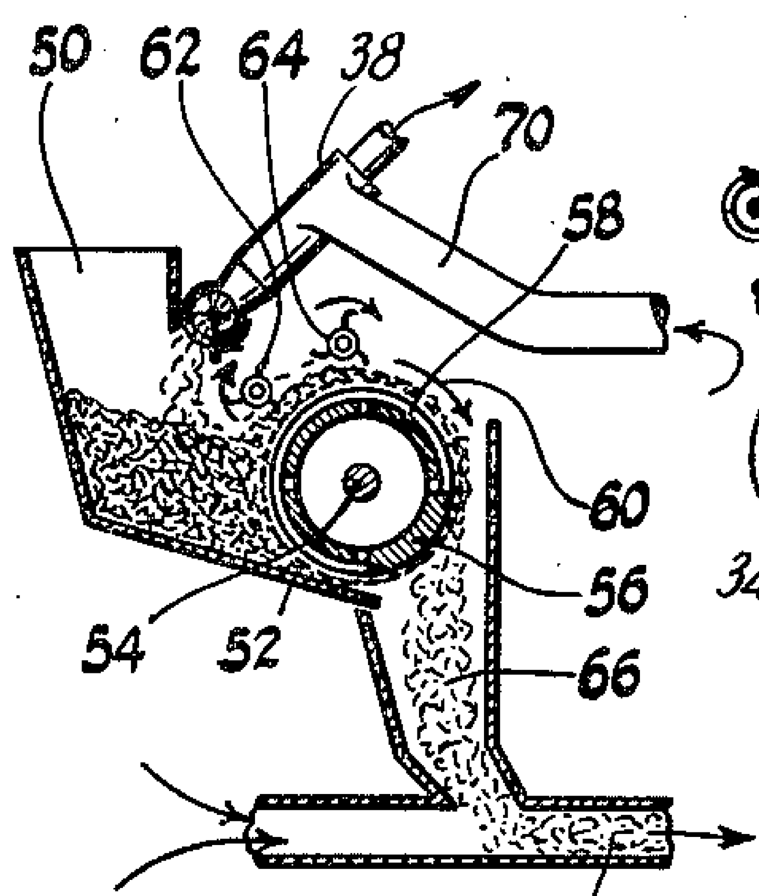

FIG. 2

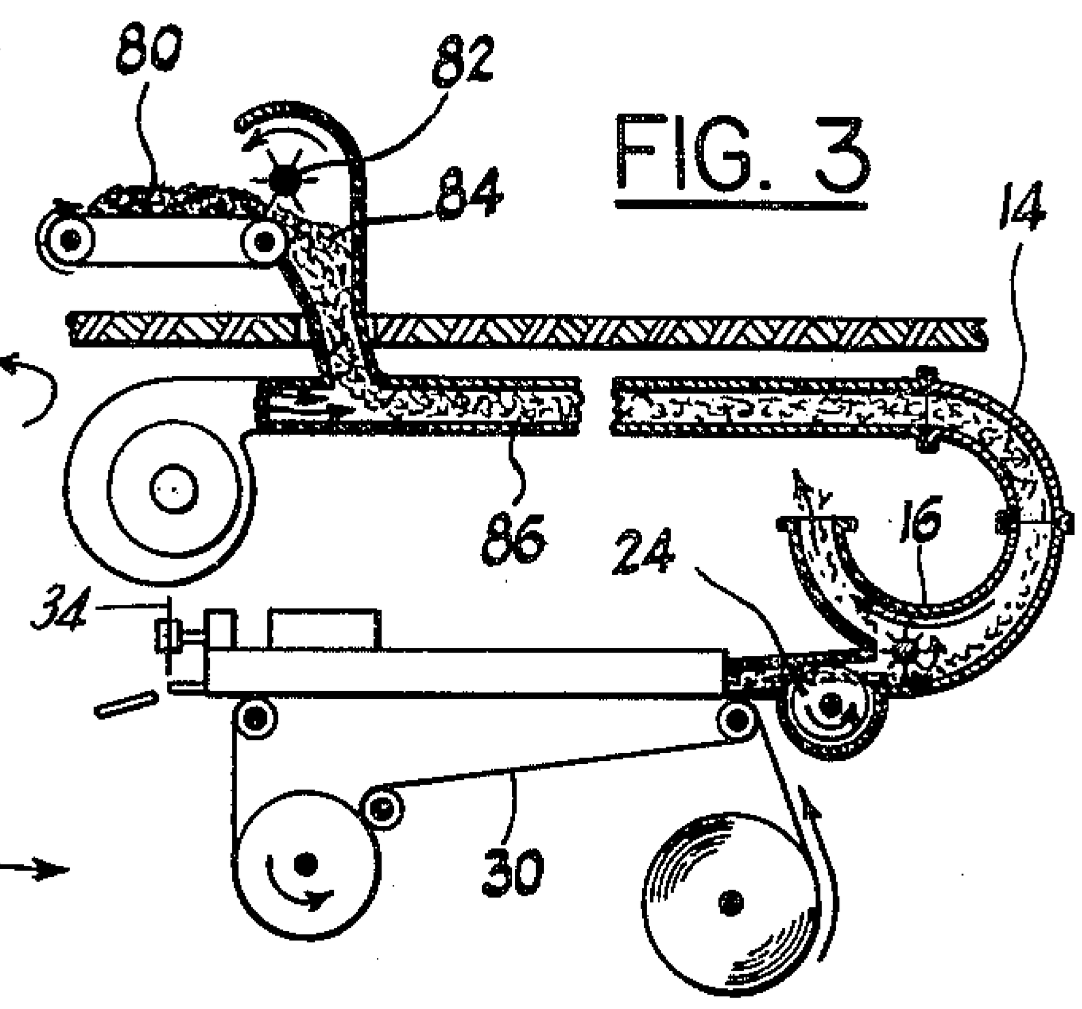

FIG. 3

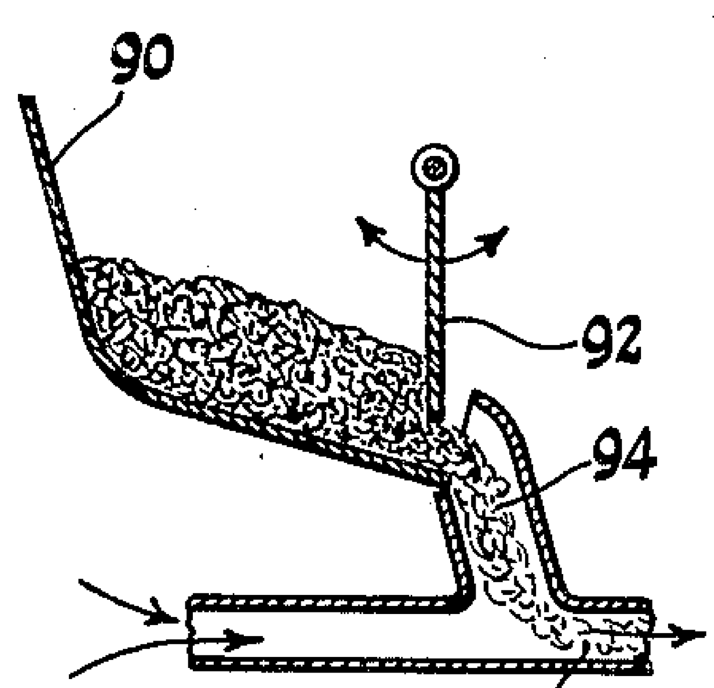

FIG. 4

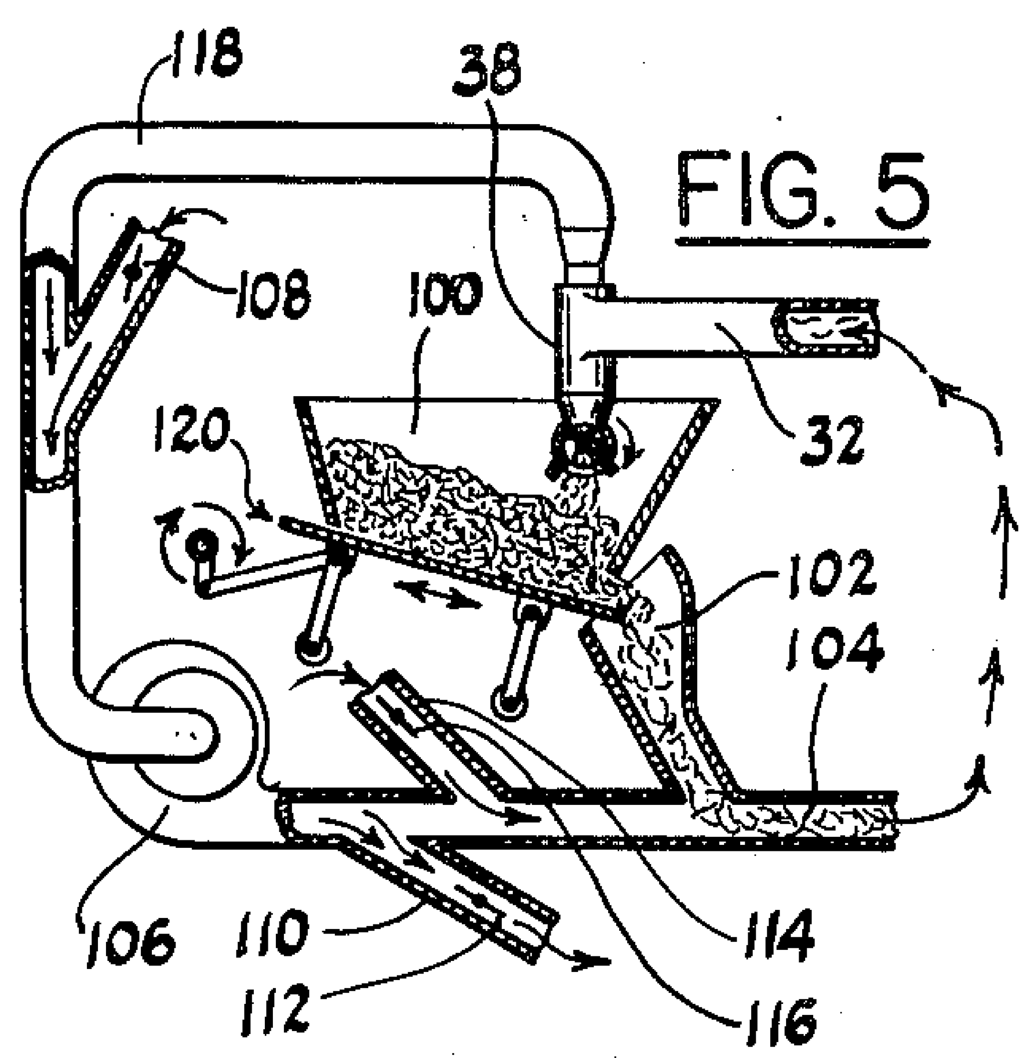

FIG. 5

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METHOD AND APPARATUS FOR CIGARETTE ROD FORMING

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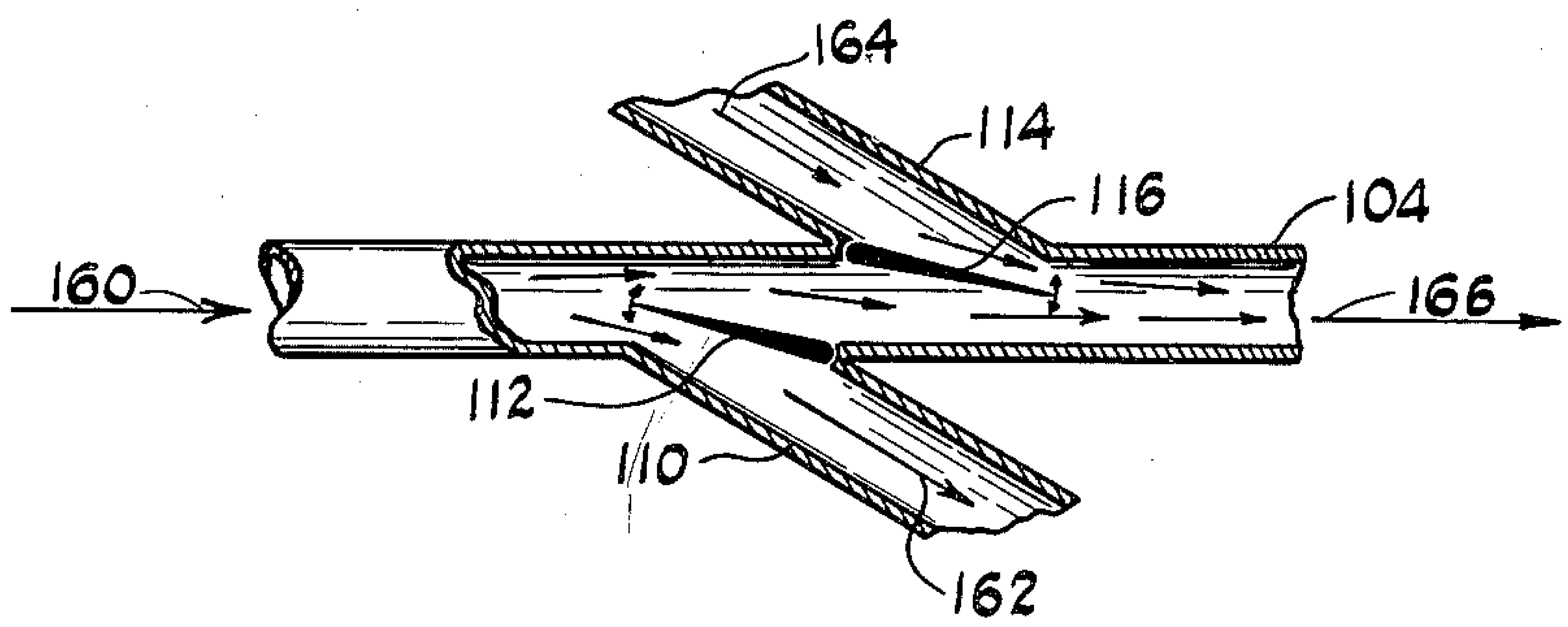

FIG. 6

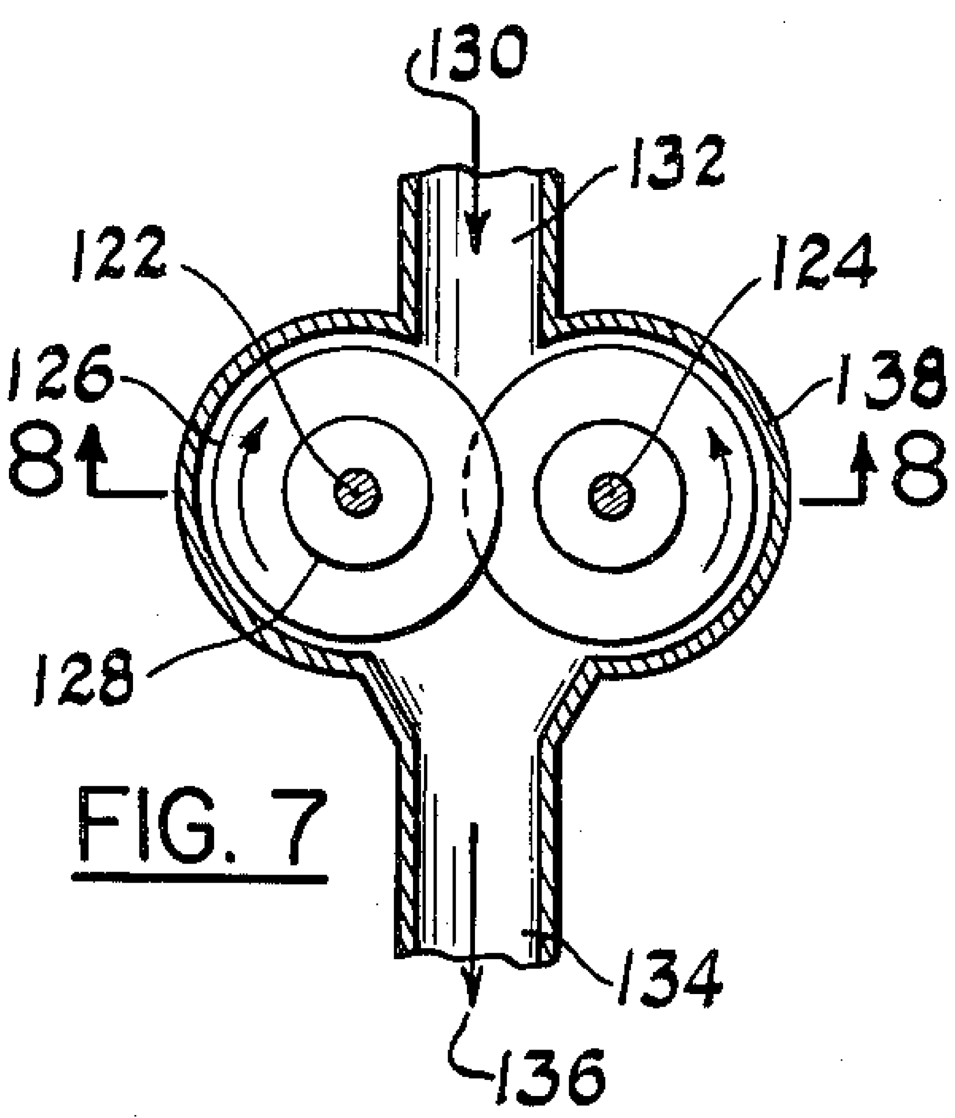

FIG. 7

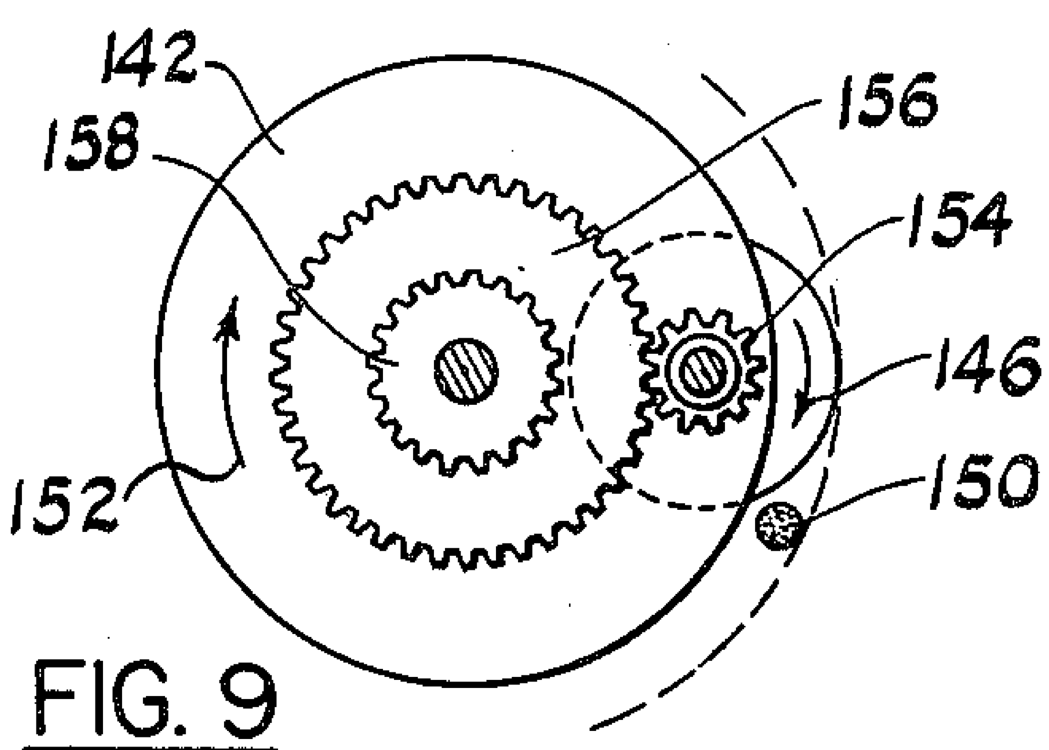

FIG. 9

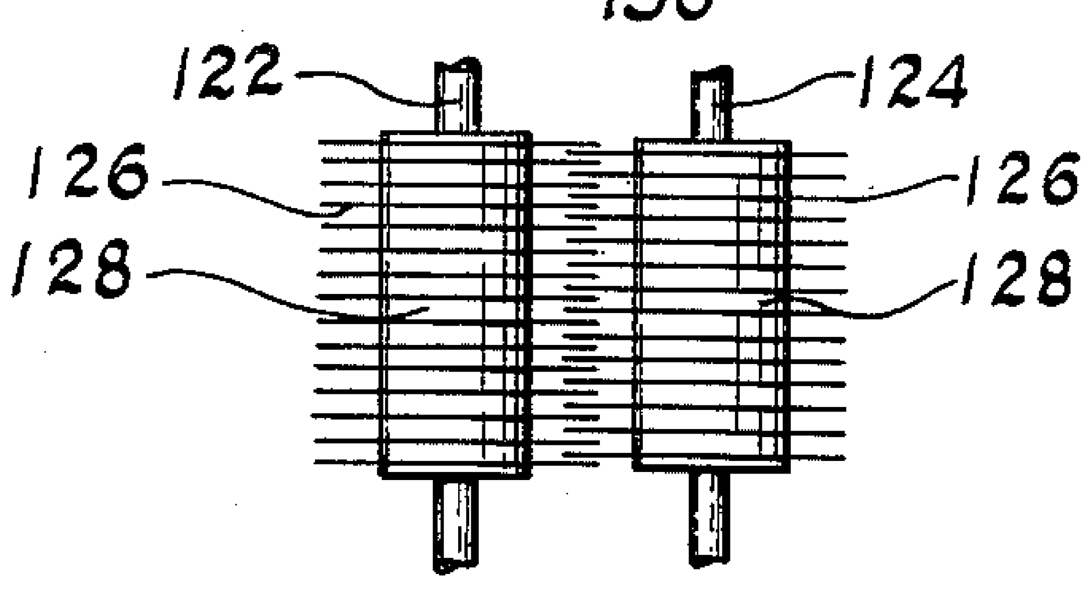

FIG. 8

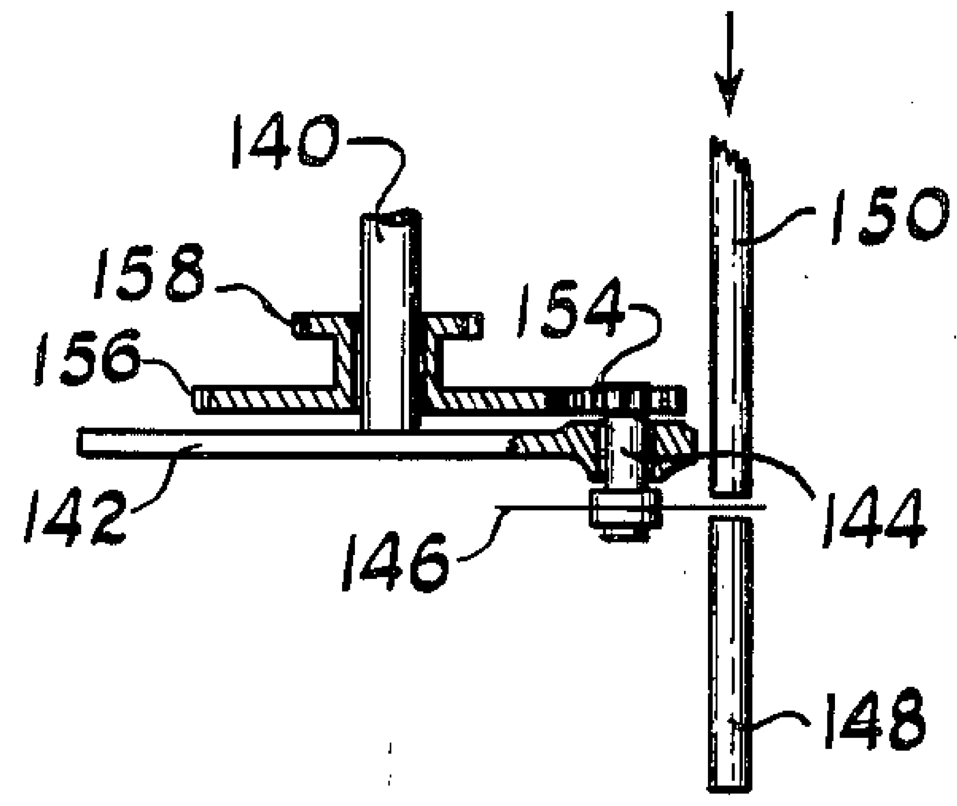

FIG. 10

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METHOD AND APPARATUS FOR CIGARETTE ROD FORMING

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4 Claims. (Cl. 131—64)

This invention relates to an improved cutting means for cutting various kinds of material including tobacco and to an improved and new process and apparatus for manufacturing a better quality cigarette more economically.

Cigarettes today are manufactured on individual self-contained machines, each producing approximately 1200 cigarettes per minute. In these machines, shredded tobacco, previously and independently specially prepared at high cost, is manually put in the hopper. Some pieces are as short as .020 of an inch and some of them are as long as 8″. This tobacco is picked out of the hopper by carded feed drums which tear the tobacco to some extent while doing so. Then the layer of tobacco on the carded drum is compacted by heavy weights pounding down, breaking the tobacco strands some more. Then a pick roller hits the tobacco out of the carded drum, breaking it literally into short pieces. These short pieces of tobacco then fall at random on a conveyor belt which in turn discharges them onto cigarette paper which ultimately forms the discharged tobacco into a cigarette rod from which the individual cigarettes are then cut off.

It will be appreciated, by nature of this conventional process, that a great deal of objectionable fine tobacco pieces are unavoidably created. Furthermore, these fine tobacco pieces cannot be blended uniformly with the larger pieces to form a perfect cigarette as far as resistance or draw of air through the cigarette is concerned.

If one manufactured cigarettes by weight, then a cigarette having a large portion of fine or short pieces would be "loose" and tobacco would fall out. This is due to the fact that the short pieces not only do not interlock but have no filling power. If a cigarette has a great portion of relatively long tobacco then the tobacco will interlock but will burn unevenly and get hot, due to the fact that the long pieces cannot be coordinated to form a uniform rod, so creating flaws or a non-uniform density.

If one manufactured cigarettes by feeling the firmness and density, then a cigarette having relatively short tobacco will contain much more tobacco than desirable from the manufacturing standpoint and also will have much more resistance to the air flow through the cigarette, thus being hard to draw, so far as the smoker is concerned. A cigarette having only relatively long tobacco would show flaws or non-uniform density due to the fact that the conventional machines cannot coordinate individual tobacco pieces to form a uniform rod. All this results in the inability to manufacture on existing conventional equipment cigarettes of uniform weight, uniform density and uniform air-flow through the cigarette.

Other problems with conventional cigarette machines also center about the cutting of the tobacco, the sharpening of the cutting knives and the undesirable accumulation of gum on the cutters.

It is an object of my invention to eliminate and overcome these undesirable features and in addition provide a new process to give manufacturing facilities more flexibility by enabling the individual steps involved in manufacturing cigarettes to be dispersed or centralized to suit the plant layout.

Another object is to provide a process and apparatus

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for manufacturing cigarettes in excess of 1500 per minute.

Another object is to provide a process and apparatus for manufacturing cigarettes which will utilize tobacco to better advantage to provide a better cigarette requiring less tobacco.

A further object is to provide a cutting means which can cut material at very high rates of speed which do not require sharpening and which do not accumulate gum.

Another object is to provide a cutting means which will sever tobacco by air cutting or stress plane cutting.

A further object is to provide a process for manufacturing cigarettes wherein a moving stream of tobacco flakes is shredded and then removed from the air stream and formed into a cigarette rod.

Other objects and features of the invention will appear as the description of the particular physical embodiment selected to illustrate the invention progresses. In the accompanying drawings, which form a part of this specification, like characters of reference have been applied to corresponding parts throughout the several views which make up the drawings.

FIG. 1 is a schematic side elevation illustrating the arrangement of the various components necessary to produce cigarettes in accordance with the process disclosure.

FIG. 2 is sectional side elevation illustrating a modified tobacco feed apparatus.

FIG. 3 is a schematic side elevation showing the components of a modified form of the invention.

FIG. 4 is sectional side elevation of another modified tobacco feeding apparatus.

FIG. 5 is a schematic side elevation of another modified form of the invention employing a closed circuit and a different type of feed.

FIG. 6 shows a modified form of damper control taking the place of dampers 112 and 116 in FIG. 5.

FIG. 7 is a longitudinal section of a modification of the cutting means 24 shown in FIGS. 1 and 3.

FIG. 8 is a plan view taken on line 8—8 of FIG. 7.

FIG. 9 is a detailed view of a drive means that could be used for the cigarette cut-off shown in FIG. 1.

FIG. 10 is a plan view shown partially in section of the mechanism shown in FIG. 9.

In the embodiment I have employed in FIG. 1, to illustrate the invention, a feed hopper 2 is supplied manually or mechanically with leaf tobacco flakes. A vibrating bottom 4 discharges the leaf tobacco flakes in a uniform stream out of a hopper 2 into intake 6 connected to air-conveying pipe 8. A stream of air created by fan 10 sucks the leaf tobacco flakes through the air-conveying pipe 8 having as a volume control a damper 12. Air-conveying pipe 8 connects to bend 14 which in turn connects to the expanded extension 16.

When the tobacco flakes, conveyed by the air stream in duct 8 enter the bend 14 they separate from the air stream, the tobacco going toward the outside and the air stream toward the inside. In the expanded extension 16, the separation becomes even more pronounced and due to the tobacco flakes gradually losing momentum, the density of the layer of leaf flakes becomes more uniform.

Before that layer of leaf flakes enters orifice 18, it may be subjected to a pick roller 20 to remove any leaf tobacco flakes in excess of the desired thickness, and discharges the excess so removed back into the air stream which takes it through conveying pipe 22. After the uniform stream of tobacco flakes passes orifice 18, it is subjected to a cutting action by cutting means 24 which cut all leaf flakes into strands.

It will be understood that pick roller 20 is only necessary to achieve the highest possible accuracy in the density of the finished cigarette, since cigarettes of uniform density can readily be attained without using a pick roller by uniformly feeding tobacco flakes, so that after the flakes are subjected to the action of cutting means **24** the filler will be of uniform density.

The entire stream of tobacco strands is then discharged through orifice **26** out of that unit onto cigarette paper **28** which is on top of a conventional conveyor belt, which may be similar to conveyor belt **30** shown in FIG. 3. The conveyor belt and cigarette paper **28** may be made to travel at substantially the same speed as the shredded tobacco discharged from orifice **26** or may travel at a faster or slower speed if desired. The cigarette paper is then wrapped around the shredded tobacco and sealed as it travels through the rod forming section **32**.

Cut-off **34** severs the rod into individual cigarettes which are collected on a conventional collecting belt **36**. The air-conveying pipe **22** with the surplus leaf flakes terminates in a discharge apparatus **38** which separates the leaf flakes from the air stream and in that case discharges them directly back into feed hopper **2**. A connecting pipe **40** between the discharge apparatus **38** and the fan **10** guides the air into the fan **10**.

While the cutter **24** employed with my new cigarette manufacturing process and machine may be of any suitable design for cutting tobacco to ribbons as it passes thereby, to practice this process and use the features of my cigarette manufacturing apparatus, I have also devised and discovered a new cutter which is particularly well suited for this purpose. This new cutter is of a unique design and constitutes one of the valuable and important novel features of the present disclosure.

This new cutting means can be used as a separate cutting means on other types of material other than tobacco and does not necessarily have to be employed with a cigarette machine. It will be understood however, that while this new cutter is particularly valuable when employed with tobacco as well as with a cigarette machine of the type disclosed herein to provide an efficient and effective cutting means for tobacco it can also be used for shredding vegetables, minerals, fabrics, plastics, metals, adhesive bearing material and other material.

The design and operation of this new cutting means will now be briefly described.

As can be readily seen in FIGS. 7 and 8 the cutting mechanism comprises two parallel shafts **122** and **124** which carry multiple circular discs **126** each disc being spaced from the adjoining discs by spacers **128**. The two multiple cutting means are surrounded by a housing **138** which has an intake chanel **132** and an output channel **134**. The tobacco flakes, which travel into the intake channel **132** in the direction of arrow **130**, are cut into strands of desired width, according to the spacing of the discs and leave the cutting means through output channel **134** as shown by the arrow **136**.

The two cutting means may be arranged axially in any manner desired. For example the discs **126** of shaft **122** may be arranged in the same plane as the discs on shaft **124** so that they will be opposite to each other, or the cutting means may be arranged so as to locate the discs **126** of shaft **122** opposite the spaces between the discs **126** on shaft **124**. The discs on one shaft will in effect support the material being subjected to stress plane cutting by the other set of discs.

In FIGS. 1 and 3 the cutting mechanism employed shows a single set of discs which are of similar construction as the cutting mechanism shown in FIGS. 7 and 8, but utilizes only one multiple cutter against a stationary counter-face. The working principle of both types of cutters however are the same.

It has been found that during the cutting action of cutters rotating about an axis at high velocity for instance with an edge velocity in excess of 600 feet per second, a stress plane of compressed air is created. This stress plane is of considerably small extension but of high compression so as to represent in some cases pressures in excess of 1,000 pounds per square inch. The stress plane does the cutting of the material, so as to prevent the actual cutting edge of the cutter from touching the material, the surfaces of said cutter being covered by thin laminations of air which also prevent said surfaces from touching the material. It has also been found, that the edge velocity of the cutter is directly related to the speed of sound in the material to be cut. This principle of cutting may be referred to as air cutting at high velocities or stress plane cutting.

It has been found that edge velocities of 300 feet per second will provide satisfactory stress plane cutting of tobacco and that velocities of 600 feet per second will prevent the accumulation of gum and juices on the cutting blades.

The above described facts make it easily appreciated that cutters, which employ the principle of high velocity cutting do not need grinding means, that they also do not need means to prevent accumulations of foreign matter for instance tobacco sap when operated at edge speeds of 600 feet per second and that the material used to manufacture the discs does not need to have the mechanical properties theretofore expected from materials of which cutters are to be manufactures.

It will also be appreciated that my apparatus may be used to feed tobacco flakes in a wide stream which is subjected to stress plane cutting in the manner described. The wide shredded stream may then be divided into individual streams which are run through rod forming mechanisms to form multiple cigarette rods from a single stream of shredded tobacco thus making several rods at one time.

Heretofore in the art of tobacco shredding the tobacco had to be compressed to a solid cake of about 18% moisture content to receive the desired shredding action. After shredding the tobacco strands cling together in slices which have to go through extra separating and drying stages in order to obtain separated strands of a moisture content of 11 to 12% which is the desired condition for cigarette making. These roundabout procedures are completely unnecessary when stress plane or air cutting means are employed as described herein.

It is also an advantage of the application of high velocity cutting in the art of tobacco shredding, that the moistening and drying stages as well as the compression and separation stages can be eliminated entirely since it is possible to shred tobacco having the moisture and density condition desired for cigarette making with high velocity discs, which results in a saving of time, cost and floor space of the installations.

From the foregoing it will be evident that I am achieving a cutting operation in a production process by means of one or more members traveling at a high velocity so as to effect an air or stress plane cutting action without having the cutting element actually touch the material. This can be achieved by having the cutting element travel in a circular path as the disc I have shown or in a straight path as an endless element traveling at a speed sufficient to create a stress plane.

The cigarette cut-off **34**, may be of any known construction suitable for cutting a traveling rod into cigarette lengths. FIG. 9 and 10 show two schematic views of a conventional cut-off mechanism suitable for this purpose, known in the art as planetary cut-off. Shaft **140** carries a disc **142**, which in turn carries shaft **144** supported rotatably in suitable bearings. The cutting blade or knife **146** is fastened rigid to said shaft **144** and severs one unit **148** of rod **150** with every turn of disc **142**, which may rotate in direction of arrow **152**. The knife **146** is rotated about the shaft **144** by means of the gears **154** and **156**, gear **154** being rigidly fastened to shaft **144**, gear **156** being rotatably supported by shaft **140**.

Gear **158**, rigidly fastened to gear **156**, may be driven by known means not shown, to supply the desired velocity to cutter **146** over the gears **156** and **154**.

If desired it is also possible to employ an air cutter of the type described at this cigarette cut-off station also.

In this case the cutting means could be of a similar construction but the blade would be made to travel at a much higher rate of speed to achieve air cutting.

The desired cutter speed of 600 feet per second or more may be achieved in any suitable way, and while a gear drive is shown a belt drive could be used for this purpose.

It will be noted from the foregoing that the improved planetary cut-off may appear similar in construction to a conventional cut-off but the manner in which it is driven and operated is totally different. As mentioned the speed of rotation of the disc is so high it effects a cutting by air and not by actual knife contact.

FIG. 2 shows a modified form of my invention employing a feeding means which may be remotely located. In this case, a stationary hopper 50 contains a cylinder 52 which slowly rotates about shaft 54. The surface of cylinder 52 consists either of a perforated sheet or wire cloth. On the inside of cylinder 52 is a stationary pipe 56 with wall section 58 removed. Air is sucked through that pipe by means of a suction fan (not shown). When in operation, the inside of cylinder 52 is under negative pressure, and holds by suction a certain amount of leaf flakes on to this surface. The leaf flakes which are held by suction on the perforated surface of cylinder 52 turn with the cylinder in the direction of arrow 60.

Doffers 62 and 64 are employed in order to even out that layer of leaf flakes. Doffer 62 removes excess of tobacco while doffer 64 evens the layer of leaf flakes to a uniform height. When the cylinder passes over the stationary suction pipe section 56, the suction air is automatically cut off, permitting the tobacco to fall off the cylinder into air intake chute 66 which terminates in air-conveying pipe 68 which in turn is connected with bend 14, shown in FIG. 1. The return air pipe 22 carrying the surplus leaf flakes is connected to return pipe 70 which in turn is connected to discharge apparatus 38 as already disclosed in connection with FIG. 1.

FIGURE 3 shows another modified form of my invention which is structurally somewhat the same as that shown in FIG. 1, except that the tobacco on a floor or at an elevation storage room may be located above the cigarette-manufacturing room. In that case the cutting means 24 which cut the leaf flakes into strands are, for reasons of convenience, reversed. The bend 14 (FIG. 3) is located above the expanded extension 16 which in turn locates the cutting means 24 below the tobacco to be cut into strands. As feeding means, I have shown how a slow-moving storage conveyor belt 80 may be employed for this purpose if desired instead of the feeds shown in FIGS. 1 and 2 from which a pick roller 82 takes these flakes and showers them into intake chute 84 connected to air-conveying pipe 86 which in turn is connected with bend 14 as already described in connection with FIG. 1.

FIG. 4 shows still another type of feeding means which may be employed with my apparatus. In that case the feed hopper 90 is stationary, having as its front wall a vibrating and/or reciprocating rake or wall 92 which in turn discharges the leaf flakes out of feed hopper 90 into intake 94 connected to air-conveying pipe 96 which in turn is connected with bend 14 in the manner already disclosed in connection with FIG. 1.

FIG. 5 shows a closed circuit air-conveying system with a feeding means of a different design. In a closed circuit air-conveying system, the air continues circulating for re-use in order to retain the maximum of the properties the air has absorbed from the tobacco while conveying it. When re-circulating air through a closed circuit system, it can and does happen that the air temperature due to friction exceeds the desired temperature. Also an over-absorption of moisture may occur exceeding the desired moisture content of the air. To prevent that, suitable air by-passes are provided as shown in FIG. 5.

When the closed circuit system is in operation, the fan 106 sucks air through conveying pipe 104, picking up the tobacco discharged out of feed hopper 100 by means of shaker 120. The amount of air necessary for the conveying of the tobacco is controlled by damper 108. Outlet means for hot and/or humid air are provided for by the outlet pipe 110 having control means 112 and fresh air intake pipe 114 having control means 116. Air control means 112 and 116 are inter-connected and work together, and remain in the same relative position. These dampers, 112 and 116, may be automatically controlled by conventional thermostats. For example, if the air should get too hot, damper 112 will open to let out a certain amount of hot air. Damper 116 will open at the same time, letting the same amount of cooler fresh air enter the system.

While FIGURE 6 shows a modified form of construction of the air control shown in FIG. 5 I have used the same characters of identification to make the working principle of this particular modification of my invention more easily understood.

The dampers 112 and 116 in FIG. 6 are intner-connected as mentioned above. When damper 112 is in lowermost position, damper 116 shall be in uppermost position. In this case the pipe 104 is free of restrictions and all the air entering with arrows 160 will be divided, one part leaving with arrow 162, one part passing between dampers 112 and 116 to leave with arrow 166 together with the air streaming into the system with arrow 164, the latter air making up for the air leaving the system with arrow 162.

From the foregoing description of the various apparatuses disclosed, my new and improved process for manufacturing cigarettes will now be quite apparent. Briefly summarized, the process consists of feeding a continuous stream of tobacco leaf pieces, having lamina flakes of a pre-determined size from a suitable source of supply such as a pick hopper which may be filled either manually or automatically by suitable mechanical means. Each piece of lamina may be approximately ¾ of an inch in width and length, and preferably has a moisture content which is substantially the same as that required in the finished cigarette.

These pre-conditioned and pre-sized tobacco flakes are fed at a uniform rate from this source of supply in the manner already described into a suitable air-conveying duct. The flakes so fed are conveyed pneumatically through the duct either by suction or by blowing. As the leaves are conveyed along this duct, they come to a bend. This bend has a drop-shaped extension for causing the lamina to separate from the air stream due to the inertia of the tobacco leaf flakes in moving through the duct, when it reaches the bend referred to.

The centrifugal forces exerted on the tobacco leaf flakes, as they travel around the bend, cause them to separate out of the air stream and form a uniform layer and stream of leaves on the inside of the outer wall of the bend. As will be appreciated, the object is to separate the lamina from the air stream by centrifugal force using an apparatus such as shown in FIG. 1 or FIG. 3, or any other suitable apparatus.

When the leaf flakes reach the extended drop-shaped part, they start slowing down since the momentum decreases (which in turn compacts them even more). This results in the forming of a layer of tobacco leaf flakes which will be of substantially uniform density and uniform thickness.

This stream of separated leaf flakes then, under its own velocity, travel towards an orifice in front of which may be placed a pick roller for removing all the leaf tobacco pieces extending above a predetermined height by throwing them back into the air stream in the manner previously described above. This leaves a uniform stream of leaf flakes which is of a predetermined thickness and of uniform density when it passes through the orifice.

When this uniform, pre-sized stream of tobacco flakes passes through the orifice by its own momentum, it is then subjected to a multiple cutting action by cutting means which slit the stream lengthwise into thick shreds or ribbons. This will result in a number of superimposed ribbons or shreds somewhat similar to wooden boards lying on top of each other after they have been cut into individual strips by means of a "gang saw."

After the cutting operation, the tobacco flakes are still in substantially the same order as the flakes were before cutting except that they have been severed lengthwise along the stream into ribbons, strips or shreds. This results in the shredded stream having a uniform volume and density regardless of the lengths of the individual shreds, since all individual shreds remain in their respective relationships.

After this, the stream of tobacco shreds may be discharged axially onto a cigarette paper tape such as that employed in a conventional cigarette making machine. It will be appreciated that where only a single rod is to be formed the entire stream is discharged onto the rod forming tape.

Where larger quantities of tobacco are handled in my process, the stream which passes through the orifice contains enough tobacco to form several individual streams and tobacco rods. In this case, after the stream has passed through the cutting operation, suitable guides are provided for maintaining the individual streams separate from one another, and each stream is guided to an individual paper tape which is wrapped around the stream to form the tobacco rod.

In the single, as well as in the multiple rod-forming process, the cigarette paper with the tobacco thereon is conveyed and supported by means of a conveying belt or tape located therebeneath. The paper is then folded about the stream by suitable folding apparatus such as is employed in a conventional cigarette making machine and the rod is then severed into the lengths desired.

Any surplus tobacco removed from the stream of leaf flakes by means of the pick roller described is again picked up by the air stream and may be discharged at any desired location. It will be appreciated that my process for forming cigarettes will remain the same regardless of whether a closed or an open pneumatic conveying system is employed. If a closed system is employed, some means may be employed to maintain the correct temperature and humidity in the air stream.

From the foregoing description, it will be apparent that cigarettes manufactured in accordance with the process disclosed will have a uniform density throughout the cigarette thereby guaranteeing a uniform flow of air through the cigarette. This is due to the fact that my new process has been devised for forming cigarettes in one continuous manufacturing operation from the leaf stage right through to a completed cigarette which avoids disturbing the shreds after tobacco leaves have been shredded and which provides means for making the stream of tobacco of uniform density before the leaf itself is shredded.

My improved process and apparatus avoids a number of undesirable operations which were heretofore necessary when cigarettes are made by conventional means. Heretofore, in order to shred tobacco leaves by conventional tobacco shredders, a high moisture had to be applied to the tobacco leaves in order to enable them to be compressed into a cake which in turn was sliced into shreds.

This high moisture content was previously necessary because the tobacco leaves had to be compressed to enable them to be shredded, since, if insufficient moisture were applied it would result in the tobacco breaking into very small pieces due to the high compression required in this shredding operation. Obviously, after the shredding was completed, it was then necessary to remove the excess moisture from the tobacco shreds before making tobacco into cigarettes.

It is obvious that under the present process this moisture adding and moisture removal step in conventional cigarette manufacturing has been eliminated which results not only in the saving of time but also in cost. Since the present process is based on pneumatically conveying tobacco leaves and the automatic shredding of the leaf flakes after they have been formed into streams of the desired density, it will be appreciated that the cigarette making machine will be capable of being operated at air conveying speeds exceeding 2400 feet velocity per minute. This is the equivalent of manufacturing cigarettes at approximately the rate of 6000 per minute rather than at conventional speeds of 1200 cigarettes per minute.

It will also be appreciated that the apparatus and processes I have described and disclosed herein is extremely versatile in that the entire process can be accomplished in a self-contained machine or the individual steps in the process may be spread out in a tobacco factory and the separate operations performed in different areas of the factory.

The individual components of my apparatus may therefore be separated and located at different stations or floors in a plant and do not have to be located relative to each other as shown. For example the feeding of tobacco flakes can be done on one floor, the stress cutting of the stream performed in another location and the shredded tobacco stream formed into a rod at still another location. Similarly the components for purposes of illustration are not necessarily shown in their proportional sizes with respect to each other but these proportions have been varied in a way considered best to illustrate the invention. It will further be appreciated that while I have shown several embodiments of different apparatuses which may be employed for carrying out my process, various other embodiments of the apparatus could also be employed for accomplishing the steps described in my process.

The invention herein above described may be varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of the many possible embodiments of the same. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. A cigarette making machine comprising a source of pre-sized torn tobacco leaf lamina, means for feeding a continuous stream of pre-sized tobacco leaf lamina from said source, a pneumatic conveying duct receiving said stream of pre-sized tobacco leaf lamina from said means and forwarding it pneumatically to a separating station, a separating station having a bend connected with said duct for separating the tobacco leaf lamina centrifugally from the air stream, as it is conveyed around said bend, an orifice positioned in the path of the separated tobacco stream for allowing only a uniform quantity of pre-sized tobacco to pass therethrough, a cutter for shredding said stream of tobacco after it passes through said orifice and means for receiving said shredded tobacco and forming it into a cigarette rod after it has been severed by said cutters, and means for severing said rod into the sections of the length desired.

2. A cigarette making machine comprising a source of pre-sized torn tobacco leaf lamina, means for feeding a continuous stream of pre-sized tobacco leaf lamina from said source, a pneumatic conveying duct receiving said stream of pre-sized tobacco leaf lamina from said means and forwarding it pneumatically to a separating station, a separating station having a bend connected with said duct for separating the tobacco leaf lamina centrifugally from the air stream, as it is conveyed around said bend, an orifice positioned in the path of the separated tobacco stream for allowing only a uniform quantity of pre-sized tobacco to pass therethrough, a pick roller for removing all tobacco in excess of a pre-determined amount from said air stream before it passes through said orifice, a cutter for shredding said stream of tobacco after it passes through said orifice and means for receiving said shredded tobacco and forming it into a cigarette rod after it has

been severed by cutters, and means for severing said rod into the sections of the length desired.

3. The process of manufacturing cigarettes continuously comprising the steps of feeding a stream of pre-sized pieces of tobacco leaf lamina continuously from a source of supply, pneumatically conveying the pre-sized tobacco leaf lamina so fed along a pre-determined path of travel, directing said pneumatically fed stream of tobacco around a curve of travel so as to centrifugally separate the pre-sized lamina so fed from the conveying air stream to form a stream of separated pre-sized lamina by directing said pneumatically fed stream of tobacco around a curve, removing all pre-sized tobacco from said stream in excess of a pre-determined amount to provide a stream of uniform cross sectional density, severing said stream of pre-sized lamina into shreds while it travels under its own momentum in a pre-determined direction, delivering said shredded tobacco stream to a rod-forming station to form said shredded lamina into a continuous cigarette rod, and severing said rod into sections of the desired length.

4. The process of claim 3 wherein said tobacco leaf lamina are pre-sized to provide pieces of about three-quarters of an inch in cross-section area.

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