

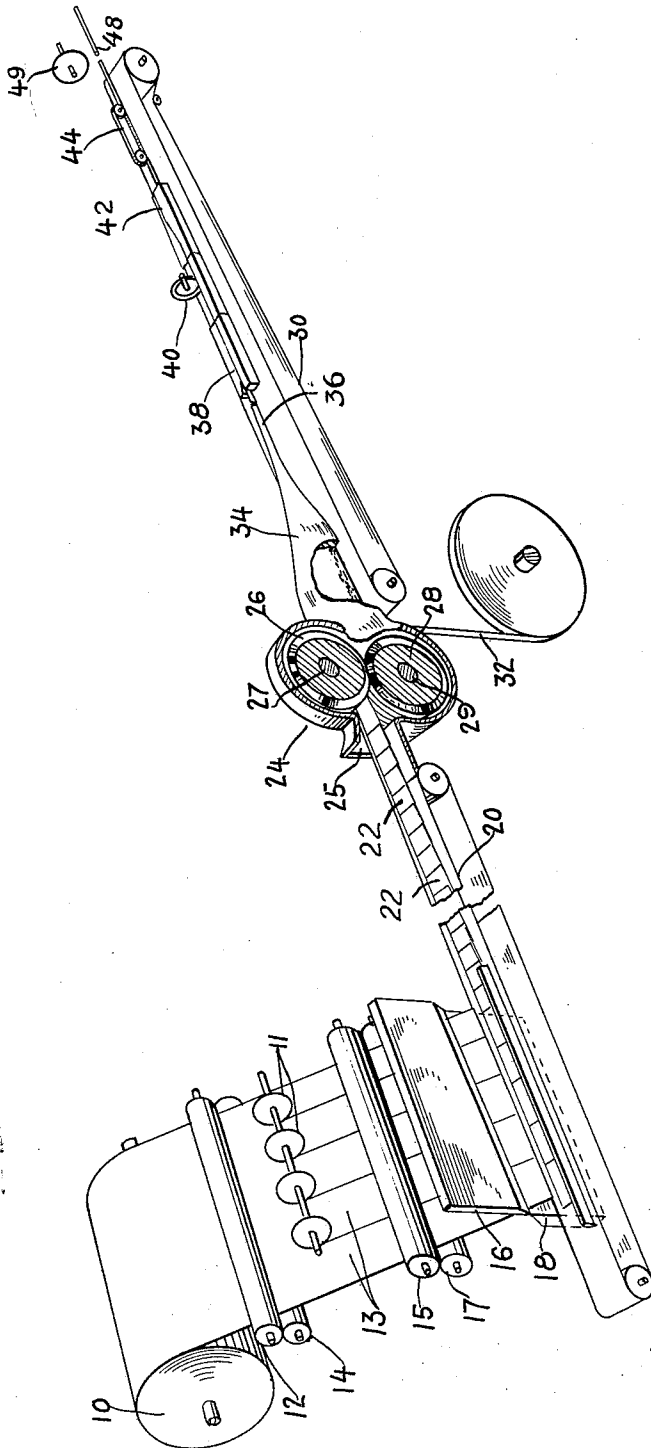
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METHOD AND APPARATUS FOR UTILIZING RECONSTRUCTED TOBACCO

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METHOD AND APPARATUS FOR UTILIZING RECONSTRUCTED TOBACCO

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This invention relates to an improved machine and method for making tobacco products and more particularly to a machine utilizing tobacco sheet material.

In the manufacture of tobacco products such as cigarettes and cigars, it is desired that the filler be of uniform density and texture. Hollow spots or dense sections in the filler are objectionable and various efforts have been made to avoid their occurrence in tobacco products. Tobacco filler used for this purpose is usually employed in the form of strip, shreds or ribbons.

I have found that if such shreds or ribbons are long and of uniform size or of a pre-determined length, it is possible to more readily control the density and compaction of the ultimate product to a very high degree.

I have also found that by utilizing reconstituted tobacco fed in a continuous strip as from a bobbin, it is possible to produce strands almost as long as the bobbin reel when the material is fed lengthwise, by utilizing a stress plane severing device such as described and disclosed in my Patent 3,026,878, dated March 27, 1962. I have also been able to produce shreds of predetermined length by cross cutting tobacco sheet ribbons into pieces which are then shredded.

It is therefore, the purpose of this invention to provide a method and apparatus utilizing and preparing tobacco sheet material for a filler in a tobacco product.

It is also an object of this invention to utilize tobacco sheet material in bobbin form to obtain a high degree of filling power and to achieve a uniform density and compaction of the tobacco.

Another object of this invention is to produce a cigarette machine which can produce cigarettes at a high rate far in excess of current manufacturing rates.

A further object is to produce tobacco strands or shreds almost as long as the bobbin of tobacco sheet material or of any predetermined length of tobacco strands desired.

Another object is to provide a feeding apparatus which will deliver tobacco sheet material into the stress plane cutting apparatus in shredding condition.

Other objects and features of the invention will appear as the description of the particular 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.

FIGURE 1 shows a perspective view of an embodiment of my machine.

The apparatus I have employed to illustrate the invention may be briefly described as follows:

The bobbin of tobacco sheet material 10, such as that shown in U.S. Patent 2,769,734, granted to David Bandel on November 6, 1956, may be of any flexible thickness having the moisture content, strength and other characteristics of a tobacco leaf.

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Bobbin material is drawn off the bobbin by feed rollers 12 and 14. This material is fed through the slitting knives 11 which slit the bobbin material into elongated ribbons 13.

These rollers 13 are fed at a controlled rate inbetween metering rollers 15 and 17 to suitable transverse cutting knives 16 and 18 which sever predetermined lengths of sheet material from the leading end of the ribbons 13. The cut rectangular lengths or portions 22 of sheet material are deposited upon the belt 20 and accumulate in shingled formation because of the advancing movement of the belt 20. The speed of movement of the belt 20 relative to the rate of cutting by cutters 16 and 18 determines how thick a layer of laminated cut tobacco length is built up on the belt 20. That is to say, that each cutting by the cutter 16 deposits a group of rectangular portions 22 on the belt 20 or on the group of portions cut by the preceding stroke of the knife 16. Since the belt 20 advances continuously, each subsequent group will be deposited in a shingled relationship to the preceding group. The slower the speed of movement of the belt 20 the thicker will be the layer of laminated tobacco portions 22 built up on the belt 20.

A suitable stress plane cutter, such as is disclosed in aforementioned Patent 3,026,878 is mounted at the discharge end of feed belt 20. This type of stress plane cutting means 24 consists of counter rotating cutting members 26 and 28 which are of a design similar to that shown and described in the patent applications mentioned.

The rotating cutting members 26 and 28 may be made up of a number of individual thin circular disks that have spacers between them or may be made from a pair of solid cutting means having shallow annular depressions through which the tobacco can pass and be cut and then discharged on the other side of the cutting mechanism 24 at high discharge velocities.

The rotating cutting members 26 and 28 are mounted on suitable shafts 27 and 29 and are driven at such speed as will effect cutting by a stress plane action on the material that is fed thereto through the funnel receiving opening 25. By regulating the speed of belt 20 and the rate at which cut pieces of tobacco material is delivered thereto by the feed rollers 12, 14, 15 and 17, and the cutting knives 16 and 18, the thickness of the shingled material supported on belt 20 may be controlled so that the shredding action performed by the cutters 24 is most effective.

The material so shredded is hurled from the cutters into a suitable guide device which forms the cut tobacco shreds into a rod shaped filler. Because of the linear velocity with which the shreds are hurled from the cutters 24, they automatically fill in any voids that are encountered in the preceding filler being formed in guide structure 34.

The filler so formed will therefore have no undesirable voids therein. This filler then passes through the guide 34 and out the narrow end 36 which reduces the filler to cigarette diameter size.

An endless belt 30 supports the wrapper material 32 such as the paper tape employed for making a cigarette, and this is then folded around the filler by the rod former 38 as it emerges from the guide 34, in a manner similar

to that shown in U.S. Patent 2,235,853, granted to E. D. Smith on March 25, 1941.

A suitable adhesive is applied to the upwardly extending lap edge of the paper by a paste wheel 40 in a manner well known in the art after which a folder 42 laps over the upwardly extending lap edge on the rod and a suitable ironer 44 heat seals the overlapped edge securely to form the finished cigarette rod 46. The cigarette rod 46 is then severed by a suitable cutter 49 into predetermined lengths 48.

The primary reason for shingling or overlapping the material on belt 20 is to give the material sufficient body to enable it to be efficiently cut by the stress plane cutters 24. One of the advantages for feeding the tobacco sheet material cross-wise as shown in FIGURE 1, is that a wide bobbin of tobacco can be used which holds a much larger quantity of tobacco. This in turn reduces the frequency of changing bobbins.

It will be appreciated, however, that multiple layers of tobacco of the proper thickness can also be obtained by feeding narrower strips of bobbin material lengthwise on top of each other or side by side or in any other suitable arrangement.

Another method of obtaining different lengths of tobacco strands may be by feeding the tobacco material from a tobacco bobbin lengthwise. This may produce strands almost as long as the bobbin, if the tobacco is fed in at the same speed as the circumferential speed of the cutting means 24. To obtain the desired thickness, in feeding the material lengthwise, the material may be folded any number of times in a lengthwise direction and then subjected to the cutting action of a stress plane cutter 24. Another method of obtaining the proper thickness in feeding the material lengthwise may be by feeding a multiple number of sheets from individual bobbins and superimposing the material so fed as to create the desired number of layers of tobacco to be cut.

To obtain highest possible filling power, the tobacco sheet material may be crinkled or crimped like crepe paper before making the tobacco sheet material into strips and small pieces. If preferred, a bobbin of tobacco sheet material which has previously been crimped or crinkled may be employed rather than have the crimping and crinkling performed immediately prior to severing and slitting the tobacco sheet material.

It will also be apparent that belt 20 could be wider so that the sheet material fed from the bobbin could be subdivided and fed to a multiple number of cigarette making machines.

The invention hereinabove described may therefore be varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of 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. In the manufacture of cigarettes, the steps of feeding at a constant rate a uniform stream of individual associated tobacco web pieces, longitudinally slitting said web pieces in said stream to form a plurality of tobacco filler strips, and directly feeding said strips into the former of a cigarette rod machine.

2. In a cigarette machine for utilizing reconstituted tobacco web to form cigarette fillers of uniform density, means for forwarding at a constant rate a uniform stream of individual associated tobacco web pieces to form a plurality of tobacco filler strips, cutting means longitudinally subdividing said forwardly fed stream to cut each of said pieces in said stream into a plurality of filler strips, and means to feed said subdivided stream directly and at a constant rate into a rod former whereby uniformity of said stream is maintained.

3. In a cigarette making machine, a source of reconstituted sheet tobacco material, means for subdividing said sheet into uniformly shaped pieces, means for assembling

said pieces into a stream, said pieces being disposed in said stream in a uniform orientation, means for progressively advancing said stream, cutting means to sever said pieces of tobacco web in said stream to form a plurality of uniformly associated filler strips in said stream, and means to advance said uniform stream of filler strips into a cigarette rod former.

4. In a cigarette machine for utilizing reconstituted tobacco web to form cigarette filler of uniform density, means for advancing said web, means for forming substantially regularly shaped tobacco pieces from the leading end of said web, mechanism to receive said pieces superposed in shingled relationship to form a uniform stream of said individual tobacco pieces, devices for advancing said stream to a cigarette rod former, and cutting means associated with said devices to longitudinally sever said stream prior to its entry into said cigarette rod former to form a plurality of filler strips from said web pieces in said stream whereby the uniformity of said shingled stream is maintained during its subdivision into shreds and passage to said cigarette rod former.

5. A machine as claimed in claim 4 wherein said cutting means comprises an interdigitating pair of high speed ganged stress plane rotary cutters rotating at high speed to prevent accumulation of tobacco juices thereon.

6. In a cigarette machine for utilizing tobacco web material to form cigarette fillers of uniform density, a source of tobacco web, means for advancing the leading end of said web at a predetermined uniform rate, severing mechanism for severing substantially regularly shaped tobacco pieces from said advancing tobacco web, mechanism to receive said pieces and to convey said pieces from said severing mechanism at a constant predetermined rate whereby to associate said pieces into a uniform stream, shredding means to longitudinally slit said pieces in said forwardly advancing stream to form a plurality of filler strips, and a conveying device to advance said stream of strips into a rod former while maintaining the uniformity of said stream of shreds.

7. Cigarette making apparatus comprising a source of continuous tobacco web material, feed means to advance the leading edge of said material at a predetermined rate, a plurality of cutting means constructed and arranged to sever regular sized particles from the leading portion of said advancing web material, conveyor means positioned to receive said regular sized particles severed by said cutting means, said conveyor means moving a pre-selected rate to convey from said cutting means a uniform stream of said regular sized particles, a plurality of slitting means constructed and arranged to longitudinally slit said uniform stream to thereby convert said uniform stream into a plurality of tobacco filler strips, and means to receive said converted stream of filler strips and feed it at a regular rate into a rod forming machine.

8. Cigarette making apparatus comprising a source of continuous tobacco web material, feed means to continuously advance the leading edge of said material at a predetermined rate, a plurality of slitting means to longitudinally slit said forwardly fed web material, transverse cutting means to repeatedly transversely sever at regular intervals an advanced portion of said web material, conveyor means subsequent to said slitting means and transverse cutting means to receive said repeatedly severed advanced portions, said conveyor means moving said severed advanced portions at a pre-selected rate to thereby convey and move a uniform stream of said severed advanced portions, a pair of interdigitating ganged rotary cutters arranged across said last formed stream to longitudinally slit said last formed stream to form said portions in said stream into a plurality of filler shreds while maintaining said shreds in said uniform stream, and means to receive said uniform stream and advance said stream at a selected rate into a rod forming machine.

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