

[54] **WRAPPING ROD-LIKE SMOKING ARTICLES**
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 [52] U.S. Cl. 131/94, 83/342, 131/11, 131/29, 131/36, 131/59, 131/89
 [51] Int. Cl. **A24c 5/58**
 [58] **Field of Search**... 131/8, 15 R, 15 C, 20 A, 27 A, 131/29, 34-36, 46, 89, 94, 59; 53/116, 118; 93/80; 83/342, 672; 242/7.23, 55.16

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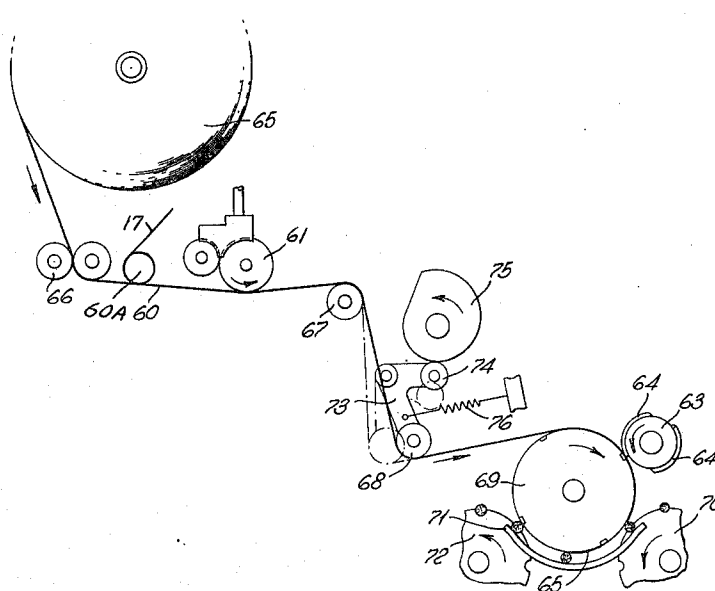
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[57] **ABSTRACT**

This invention concerns making a smokable article including a tubular part, the tubular part being made by winding a strip of sheet material in a helix with each successive turn overlapping the previous one. The invention is especially applicable to the manufacture of cigars, the helically wound tubular part being a final overwrapping of reconstituted tobacco sheet.

20 Claims, 11 Drawing Figures



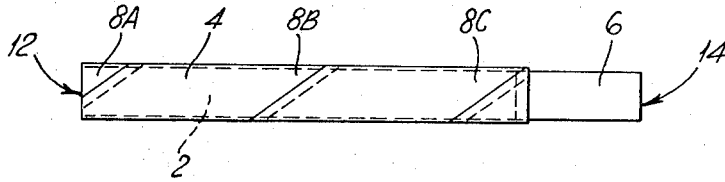


Fig. 1.

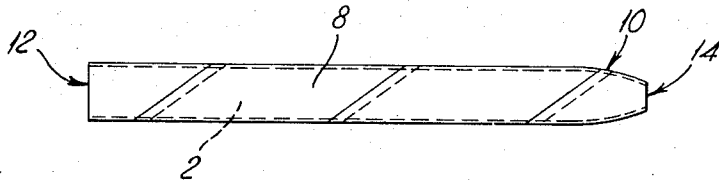


Fig. 2.

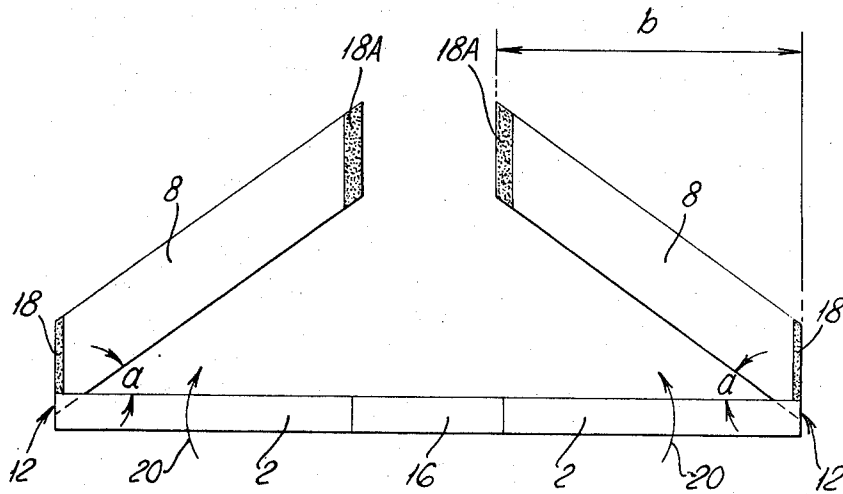


Fig. 3.

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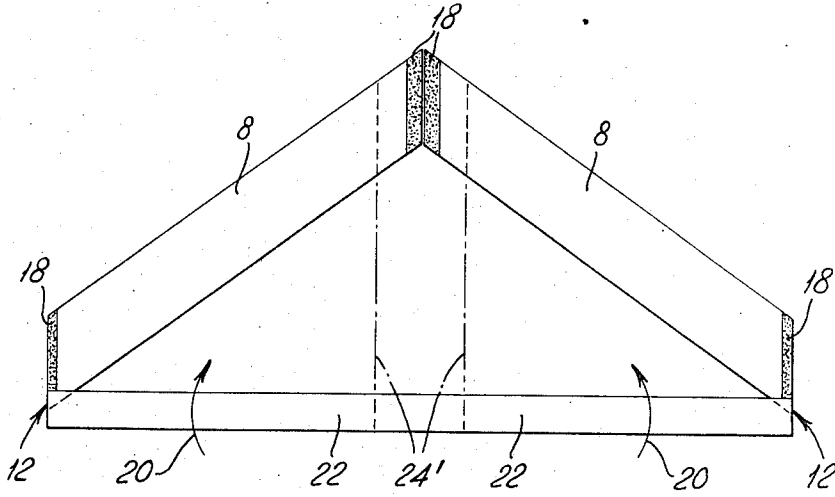


FIG. 4.

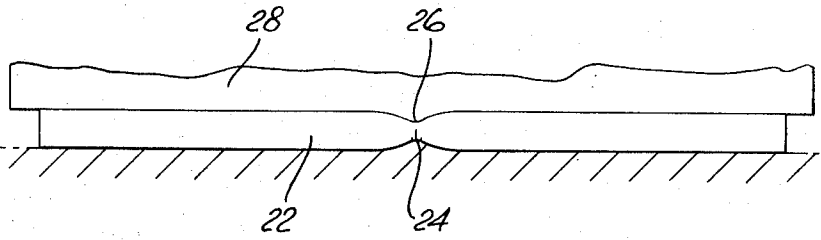


FIG. 5.

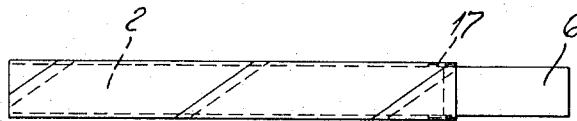


FIG. 6.

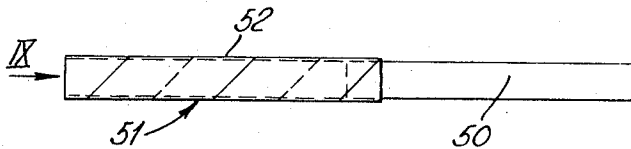


FIG. 7.

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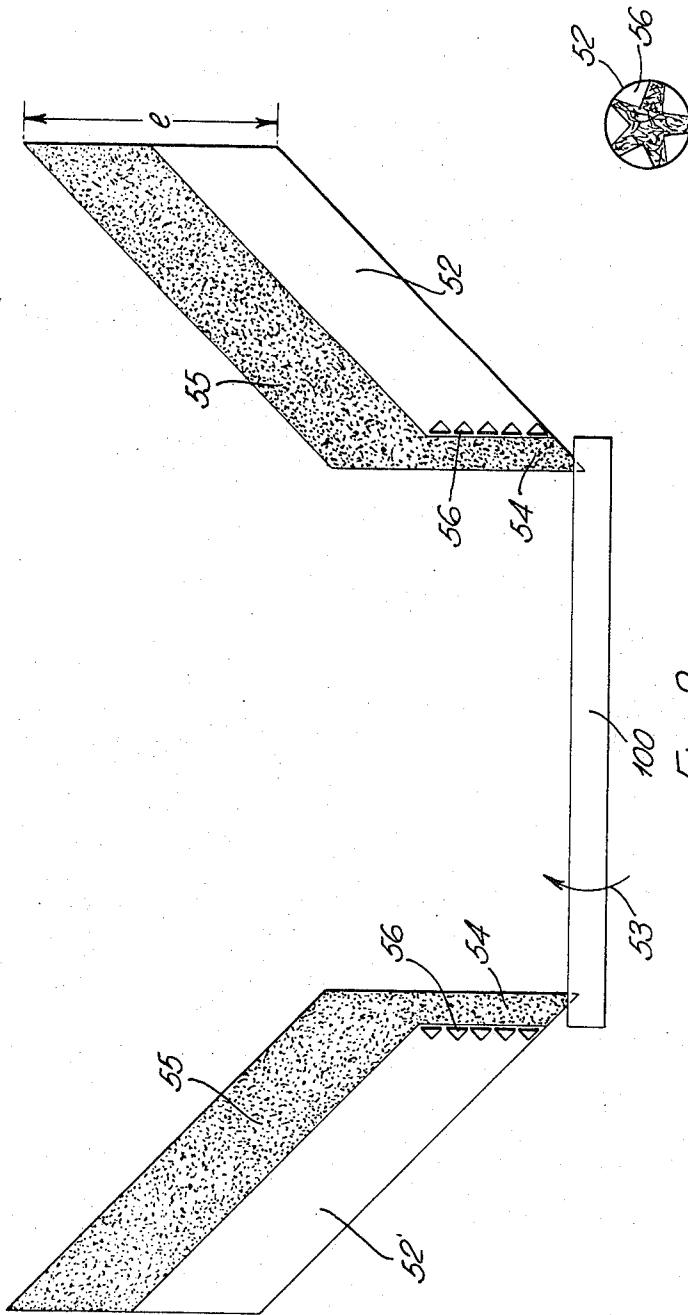


FIG. 9.

FIG. 8.

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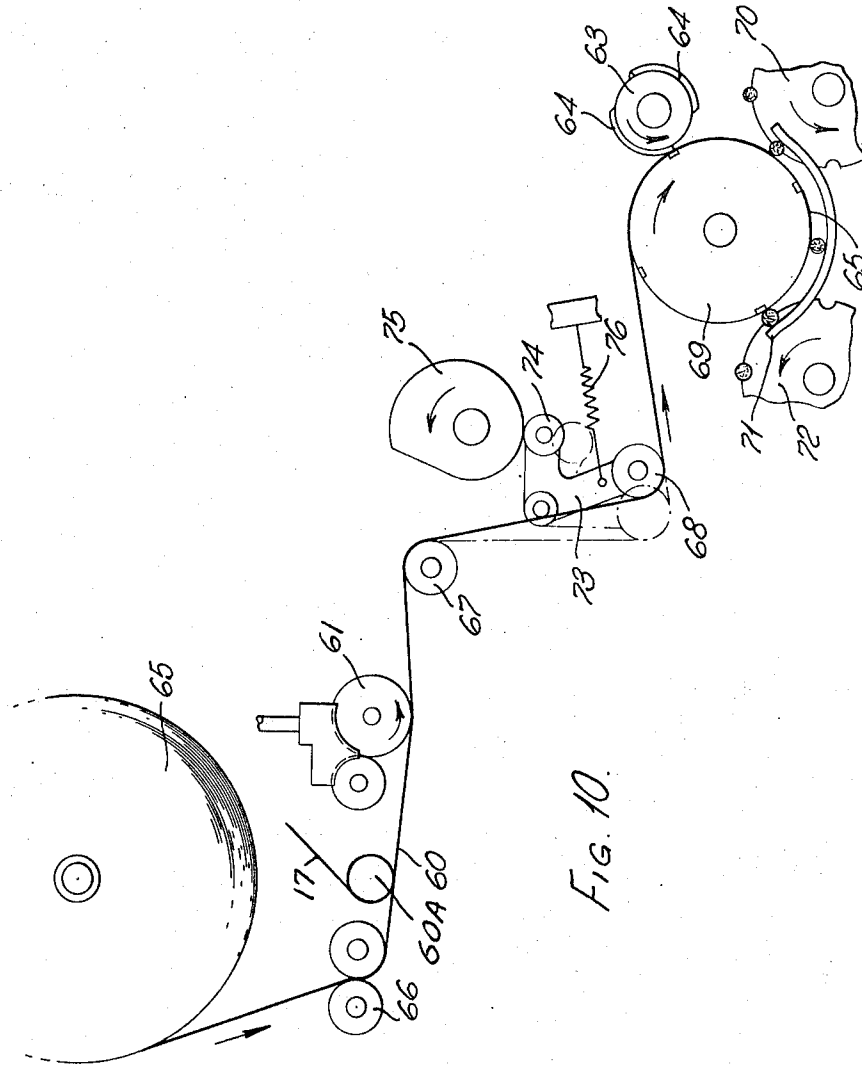


FIG. 10.

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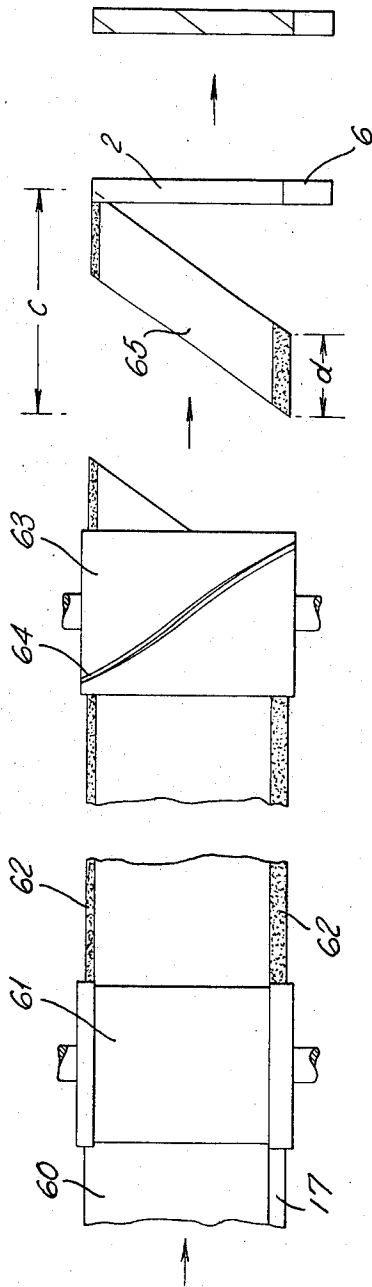


FIG. 11.

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WRAPPING ROD-LIKE SMOKING ARTICLES

This invention is concerned with the manufacture of smokable rod-like articles. It is particularly concerned with the manufacture of cigars including a smokable rod enclosed in an outer wrapping of sheet material formed, for example, from reconstituted tobacco. However this invention also has other applications; for example it may be used in the manufacture of cigarettes comprising a smokable rod and a tube with one end secured around one end of the rod.

According to this invention, in a method of making a smokable rod-like article including a tubular part, the tubular part is made by wrapping round at least part of the article a strip of sheet material arranged initially at an inclination to the longitudinal axis of the cooperating part of the article, the article being rolled so that the strip is wound into a helix to form the tubular part.

The invention will be further explained with reference to the accompanying drawings. In these drawings:

FIG. 1 shows a filter-tipped cigar with a helical outer wrapper;

FIG. 2 shows a cigar with a tapered end and a helical outer wrapper;

FIG. 3 is a schematic plan view of two strips of wrapper material ready to be wound round cigar rods to make two filter-tipped cigars;

FIG. 4 is similar to FIG. 3 but illustrates wrapping and shaping of a double length cigar rod to make cigars such as shown in FIG. 2;

FIG. 5 is a diagrammatic sectional view of a double cigar length rod being rolled between a plate and a roller to form two cigars with tapered ends;

FIG. 6 shows a filter-tipped cigar similar to that shown in FIG. 1 but incorporating a reinforcing strip;

FIG. 7 is a cross-sectional view of a cigarette according to the invention including a helically wound tube;

FIG. 8 is a diagrammatic plan view of a double-length tobacco portion and two strips of tube material for making two cigarettes in the form shown in FIG. 7;

FIG. 9 is an end view in the direction of the arrow IX in FIG. 7;

FIG. 10 is a schematic side view of apparatus for making the cigars shown in FIG. 6; and

FIG. 11 is a diagrammatic plan view, on an enlarged scale, showing various stages in the formation of the cigars.

FIG. 1 shows a filter-tipped cigar comprising a length of tobacco rod 2 wrapped in a longitudinal wrapper 4 (for example as produced by a continuous rod-making machine); a filter 6; and a helically wound outer wrapper 8 of reconstituted tobacco sheet. FIG. 2 shows a cigar of similar construction but without the filter 6 and with a tapered end 10.

The wrapper 8 is helically wound round the cigar in such a way that the first turn of the helix is at the lit end of the cigar, designated 12 in the drawings and the last turn is at or near the mouth end 14. Each turn of the helix overlaps the previous turn, thus preventing the wrapper from unwinding as the cigar is smoked. Thus turn 8B of the helix overlaps turn 8A and turn 8C overlaps 8B, etc. The overlap may for example be about 2 or 3 mm. The rod 2 may be about 10mm in diameter and about 80 mm in length and the filter 6 may be about 20 mm long.

FIG. 3 shows how the filter-tipped cigar shown in FIG. 1 can be made two at a time. Two strips of wrapping material 8 are fed into position, as shown, adjacent to two lengths of tobacco rod 2 in end-to-end aligned relationship with a double-length filter 16 lying between the rods. The ends 12 of the rods are aligned with the short outer edges of the strips. Each short edge of a strip 8 has a stripe 18 of glue on it. The two rods 2 and the double filter 16 are rolled together in the direction of arrows 20 so that the strips 8 are wound helically about the rods. The angle between the rod and the strip, marked a in FIG. 3, may for example be about 35° . The strips 8 are of such a length that, when wound fully onto the rods and filter, they completely enclose the rods and overlap slightly on to the filter. Preferably the stripes of glue 18A contact both the rod 2 and the double-length filter 16.

The rolling operation may be carried out in a machine similar to a cigarette plug assembler, for example such as is described in U.S. Pat. No. 3,136,320 or 2,963,026. The helical wrapper strips 8 are applied somewhat similarly to the manner in which the "cork" is applied to a cigarette and double length filter in such a machine. As in the case of cigarettes, the double-length filter 16 is severed after the wrapping has been completed, to produce two filter-tipped cigars. A more detailed description of apparatus for feeding the web of wrapper material will be given later.

Since the mechanical strength of reconstituted tobacco sheet may be low, it may be desirable to provide a reinforcing strip at the joint between the rod and the filter. FIG. 6 shows a cigar, similar to that shown in FIG. 1, with a reinforcing strip 17 incorporated to strengthen the cigar where the rod 2 and filter 6 are joined. The reinforcing strip 17 could be applied to the overwrapper web 8 as a gummed strip of paper, or similar material, in a position equivalent to the gummed area 18A shown in FIG. 3. FIG. 10 shows the gummed strip 17 being fed onto the overwrapper web 60 by a roller 60A so that the strip is secured along one edge of the web.

Clearly other items could be joined to the rods 2 in a similar manner, either instead of or as well as filters. For example, the double-filter 16 could be replaced by a double-length plastic mouthpiece (possibly also incorporating a filter) so that, when severed, two helically-wrapped cigars are produced, both having plastic mouthpieces.

With each wrapper 8 being wound in a helix starting from the lit end 12 of the cigar, the wrapper 8 cannot unwind as the cigar is smoked. It is consequently theoretically only necessary to glue the mouth end of the wrapper 8, i.e. the end which is adjacent to the end 14 of the cigar, to completely secure the whole wrapper. Glue is however also preferably applied to the wrapper at the lit end 12 of the cigar to enable the rods 2 to pick up the strip 8 and start winding the helix.

FIG. 5 illustrates diagrammatically how the plate and roller drum of a machine in which the wrappers are applied to the cigars may be profiled so as to shape the mouth ends 14 of cigars such as that shown in FIG. 2. When producing cigars of this type, double cigar lengths of tobacco rod 22 are fed to the rolling machine and commence rolling, at the position shown in FIG. 4, in a manner similar to the rod and filter combination of FIG. 3. A raised section 24 in the plate then cooperates with a raised section 26 on roller 28 to shape

the middle section of the rod 22 as it is rolled across the plate. The edges of this raised section are shown by chain dotted lines 24' in FIG. 4. The wrapped rod is then severed to produce two cigars with tapered ends. It may also be desirable to smooth the ends of each cigar, for example by inserting the tapered end in a spinning shaped die, to obtain an acceptable finish to the tapered end 10 of the cigar.

The shaping of the middle section of the rod 22 is made easier if the rod is formed with a less densely packed tobacco filler at this section. The wrapping is also improved if the longitudinal wrapper web, which is applied in the continuous rod-making machine has a number of longitudinal slits in it at this section so that the wrapper has four equally spaced slits extending parallel to the longitudinal axis of the rod from the mouth end of the cigar. The slits may be cut in the longitudinal wrapper by knives positioned in the printer on the paper feed of the continuous rod-making machine.

In both examples the strips 8 of wrapper material may be cut from webs of sheet material, for example reconstituted tobacco. Each web has a width equal to the wrapped length of the finished cigar; for example in FIG. 3 the web width would be equal to the dimension marked *b*.

FIG. 7 shows a cigarette according to this invention comprising a wrapped tobacco rod 50 and a helically wound tube 51. The tube 51 is wound helically in a similar manner to that already described for over-wrapped cigars. FIG. 8, which is somewhat similar to FIGS. 3 and 4, shows a double-length tobacco rod 100 and two sheets of tube material 52 to form the tubes 51 of two cigarettes. As the rod 100 is rolled in the direction of arrow 53, the sheets 52 are wound helically to form two tubes 51; one joined to each end of the rod 100. The rod 100 is then severed at its mid-point to form two cigarettes in the form shown in FIG. 7.

The sheets 52 have glued areas which are shown shaded in FIG. 8. The glued section 54 is the part of the sheet 52 which encloses the end of the rod 100, while the glued section 55 secures each turn of the helix to the previous turn. Thus the resulting tube 51 is entirely glued where the sheet is in contact with the tobacco portion 50 or itself, yet the inside surface of the tube 51 is free of glue and is therefore free to absorb some of the constituents of the tobacco smoke as it passes down the tube. The sheet 52 may, for example, have a width (dimension *e* in FIG. 8) equal to twice the circumference of the rod 100, and the glued section 55 may extend over half the width as shown.

The sheets 52 may also have a number of triangular cut out pieces 56 which form a ring of star-shaped lugs in the finished cigarette, as shown in FIG. 9. These lugs prevent the burning fireball from being sucked up through the tube when the cigarette is nearly completely smoked.

The cigarette shown in FIG. 7 may include a patch of fireproof gum on the inside of the wrapper adjacent to the tube 52, which helps to prevent the fireball coming out and to prevent the cigarette being smoked to a point at which the tube can begin to burn. Alternatively (or in addition) fireproof adhesive material can be included in the join between the rod portion 50 and the tube 51.

A piece of wadding (for example cotton wool) or some other filter material may be incorporated in the tube as it is made. It could for example lie between the

lugs 56 and the tobacco portion, or anywhere along the length of the tube 51. The tube 51 could for example join the tobacco rod 50 to a filter rod by over-lapping and being struck to the end of the filter rod closest to the tobacco rod 50. Alternatively, the tube could be formed by being rolled round one end of a filter rod (or around the whole of the filter rod) and the resulting assembly may then subsequently be joined to a tobacco rod by a separate uniting band.

It should be understood that a cigar or cigarette according to this invention can, if desired, be made one at a time, instead of two at a time as described above.

The rolling operation to apply the helical wrapper to the cigars and cigarettes of this invention may be carried out in a machine basically similar to a cigarette plug assembler. However since a parallelogram shaped piece of material is needed for the helical winding as distinct to rectangular shaped piece of "cork" normally used in a cigarette plug assembler, some modification to the web feeding system for the sheet material is required.

FIG. 11 shows diagrammatically a web 60 passing beneath a glueing roller 61 which applies a stripe of glue 62 along each edge of the web 60. The web then passes to a cutter roller 63 having a helical knife 64 which cuts the parallelogram shaped piece 65 which is here shown, as an example, ready to be wrapped onto a tobacco rod 2 and a filter 6 to make a cigar such as that shown in FIG. 1.

FIG. 10 is a side view showing the apparatus in rather more detail. The web 60 is unwound from a reel 65 by a pair of drive rollers 66 and passes from there to the glue roller 61. The gluer may be as described in our British Pat. Specification No. 919,740. The web passes from there over a further roller 67, and round a tensioning roller 68 to a suction drum 69 where it is cut by the helical knives 64 into the pieces 65. Tobacco rods 2 (and filters, not shown) are brought to the apparatus by a fluted drum 70, rolled along a plate 71 by the drum 69 and carried away as wrapped cigars by a second fluted drum 72.

The cut pieces of web 65 are carried into contact with successive tobacco rods by the suction drum 69 and are then wrapped round the tobacco rods as they are rolled along the plate 71.

Clearly the drum 69 must have a peripheral speed equal to the peripheral speed of the cigars being wrapped, and this will also be the speed of the pieces of web 65. This speed will be equivalent to the length *c* (FIG. 11) per cigar. However, although the web 60 is cut obliquely to form the pieces 65, it will be apparent that the length of web required to make each piece 65, that is for each cigar, is only the length *d* shown in FIG. 11. Thus the web 60 must be unwound from the reel 65 at a speed of only the length *d* per cigar. Since the web 60 is not cut instantaneously by the knife 64, the web 60 must travel at the speed of the drum 69 during the cutting operation.

This is achieved by the roller 68 moving so as to allow the web 60 downstream of it to move at the speed of the drum 69. The roller 68 is mounted on a crank 73 having a cam follower 74 held against a cam 75 by a spring 76. The cam 75 is rotated at twice the speed of the cutter roller 63 so that it completes one revolution for each piece 65 which is cut. The cam 75 is so profiled that it allows the crank 73 to move counter clockwise from the dotted position to the solid-line position

shown in FIG. 10 during each cutting operation, thus allowing the web 60 to be fed at the same speed as the drum 69, but moves the crank in the other direction when the web 60 is not being cut, so as to accumulate a reserve of web to allow for the necessary increase in speed during the next cut. During clockwise movement of the crank 73 the leading edge of the web 60 is dragged backwards across the surface of the suction drum 69.

We claim:

1. Apparatus for making cigars, comprising a plate, a rotary drum, a substantially concentric plate curved about the axis of the drum and cooperating therewith to enable the drum to roll a succession of assemblies across the plate, each assembly comprising a preformed wrapped cigar and an axially aligned preformed mouth-piece, and means to deliver a strip of sheet material to the assembly at an inclination to the longitudinal axis of the cigar, so that as the assembly is rolled across the plate, the sheet material is wrapped into a helix about the cigar and at least partly about the mouthpiece, with each turn of the helix overlapping the previous turn.

2. Apparatus according to claim 1 including a rib on the plate or the drum to reduce the diameter of the mouth end of the smokable rod.

3. Apparatus according to claim 1 including means to apply glue to the sheet material only at the mouth end of the cigar.

4. Apparatus according to claim 1 in which the drum and plate wind the sheet material starting from the end of the cigar to be lit remote from the mouthpiece and proceeding towards the mouthpiece.

5. Apparatus according to claim 4 including means for applying adhesive to the sheet material over an area which overlaps part of the mouthpiece and an adjacent end portion of the cigar.

6. Apparatus according to claim 5 including means for applying adhesive to the sheet material over a second area adjacent the end of the cigar to be lit and spaced from the first-mentioned area by a major proportion of the length of the cigar.

7. Apparatus according to claim 5 including means for applying to the sheet material, prior to rolling, a strip of reinforcing paper, the strip being applied along an area of the sheet material which overlaps part of the mouthpiece and part of the adjacent end portion of the cigar, the strip being secured by adhesive to the sheet material and to the portions of the mouthpiece and cigar which it overlaps.

8. Apparatus for making smokable rod-like articles, comprising means for feeding a continuous web of sheet material onto a rotating drum; a helical knife cooperating with the drum to cut the web at regular intervals obliquely in relation to the side edges of the web to form a succession of non-rectangular parallelogram portions; control means to allow the web to be drawn from a source at a predetermined speed and to allow the web, while being cut, to move at a higher speed equal to the peripheral speed of the drum; means for feeding a succession of preformed smokable rod-like articles transversely of their lengths and in timed relation to the parallelogram portions, with the axes of the rod-like articles lying transversely to the side edges of the parallelogram portions; and rolling means for rolling each rod-like article relative to the corresponding parallelogram portion to form the parallelogram por-

tion into a helically wound tube at least partly surrounding the rod-like article.

9. Apparatus according to claim 8 in which the control means comprises first guide means for directing the web towards the drum in a predetermined direction; second guide means for directing the web towards said first guide means transversely to the said predetermined direction, whereby the web passes around the first guide means in moving from the second guide means to the drum; and means for moving the first guide means in substantially the said predetermined direction while the web is being cut on the drum and for moving the first guide means in the opposite direction between successive cutting operations.

10. Apparatus according to claim 9 in which said rolling means comprises a curved plate cooperating with said drum on which the web is cut.

11. Apparatus according to claim 8 in which the rolling means comprises a rotating drum cooperating with a plate curved about the axis of the drum and spaced from the drum by a distance substantially equal to the diameter of the rod-like articles, whereby each rod-like article is rolled as it passes through the gap between the drum and the plate.

12. Apparatus according to claim 8 in which each rod-like article comprises a preformed wrapped cigar and an axially aligned mouthpiece abutting one end of the cigar, and in which the rolling means is disposed to wind each parallelogram portion around the cigar and around at least part of the mouthpiece to join the mouthpiece to the cigar.

13. Apparatus according to claim 8 in which the rolling means includes a rib to reduce the diameter of the mouth end of each article during rolling.

14. Apparatus for making smokable rod-like articles, comprising means for feeding a continuous web of reconstituted tobacco; means for securing by adhesive along one edge of the web a strip of paper; means for obliquely cutting the web at regular intervals along lines inclined with a predetermined angle to the side edges of the web to form a succession of non-rectangular parallelogram portions; means for feeding in timed relation to the parallelogram portions a succession of assemblies each comprising a preformed wrapped cigar and an abutting, axially aligned mouthpiece with the assemblies lying transversely to the side edges of the parallelogram portions and positioned so that the strip of paper on each parallelogram portion overlaps portions of the abutting ends of the cigar and mouthpiece; and means for rolling each assembly in turn relative to the corresponding parallelogram portion to helically wind the parallelogram portion around the cigar and to join the mouthpiece simultaneously to the cigar.

15. Apparatus according to claim 14 in which the inclination of the oblique cuts across the web is such that each parallelogram portion cut from the web engages first the end of the cigar to be lit remote from the mouthpiece, whereby the parallelogram portion is wound from the said end of the cigar to be lit and towards the mouthpiece, and in which each convolution of the parallelogram portion around the cigar overlaps the previous convolution.

16. Apparatus according to claim 15, including means for applying adhesive to secure the strip to both the mouthpiece and the adjacent end portion of the ci-

gar, the said adhesive also securing the whole parallelogram portion against unwinding.

17. Apparatus according to claim 14 comprising duplex side-by-side means for simultaneously winding two oppositely inclined parallelogram portions around axially aligned assembly elements for forming a composite comprising two of the said assemblies connected together, which assemblies can then be separated by cutting the composite across the middle.

18. Apparatus for making smokable rod-like articles including a wrapper, comprising a rolling drum; a plate curved about the axis of the drum and arranged so that a rod-like article can be rolled along the plate between the drum and the plate; means for feeding onto the plate a succession of rod-like smoking portions and a succession of rod-like mouthpieces in axial alignment with the smoking portions; means for feeding to the drum a web of wrapper material having a width equal to the desired wrapped length of the articles fed onto the plate; cutter means cooperating with the drum for cutting a succession of oblique strips from the web so that the strips are arranged on the drum at an inclination to the longitudinal axis of the rod-like portions fed

onto the plate; and means to hold the strip on the drum so that as it rotates it rolls the axially aligned rod-like smoking portion and mouthpiece across the plate and thereby wraps the strip around the smoking portion and at least partly around the mouthpiece so as to overwrap the smoking portion while at the same time joining it to the mouthpiece.

19. Apparatus according to claim 18, further comprising means for feeding a relatively narrow web of reinforcing material onto the web of wrapper material and sticking the reinforcing material onto the wrapper material in a position corresponding to the join between the smoking portion and the mouthpiece, so that when the strip of wrapper material has been wrapped around the smoking portion and mouthpiece the reinforcing material encircles the join between them.

20. Apparatus according to claim 18 including means to apply to the wrapper web a strip of adhesive at a position corresponding to the end of the smokable portion to be lit remote from the mouthpiece, and to the portion bridging the join between the smoking portion and mouthpiece.

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