METHOD AND APPARATUS FOR THE MANUFACTURE OF CIGARETTES


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13 Claims. (Cl. 131—61)

1. This invention relates to a method and apparatus for the manufacture of cigarettes. In my prior Patent No. 2,185,293, issued January 2, 1940, I have disclosed a cigarette and process of treating the same in which one or both ends of the cigarette are treated to securely bind the tobacco in position so as to prevent loosening of tobacco particles prior to or during smoking while at the same time permitting free passage of the treated portion of the filler. In the method there disclosed, the cigarettes are treated after manufacture by passing them through a dipping tank which contains a treating solution and coats the end of the cigarette and the end portion of the filler.

It is an object of the present invention to provide an improved method and apparatus for treating cigarettes and particularly one which is adaptable to treating of the filler and/or the wrapper either separately or together during the manufacture of the cigarette.

One well known and commonly used method of cigarette manufacture utilizes a continuous filler of tobacco shreds which is laid upon a continuously moving web of wrapper and thereupon the wrapper is enveloped about the filler to form a continuous rod which is subsequently cut into sections forming a complete cigarette.

The present invention is particularly adapted for treating of cigarettes during this process of manufacture and embraces the use of an intermittently operated impregnating means for applying the binder or other solution to the filler and/or to the wrapper. Such solution may serve not only as a binder to prevent the strands of tobacco from loosening at the end of the cigarette, but preferably also may contain combustion resistant materials which serve to put out the cigarette when it has burned down to the beginning of the treated end portion.

While the present invention does not relate per se to the character of the treating solution, it may be pointed out that any of the known mixtures and solutions used for these and similar purposes may be applied more effectively in the manufacture of cigarettes at high speed and low cost by the use of the present invention.

Further objects and advantages of the present invention will be apparent by reference to the following description and to the drawings in which:

Figure 1 is a diagrammatic view of a method and apparatus for treating cigarettes during manufacture embodying a preferred form of the present invention.

Figure 2 is a diagrammatic view of an alternate form of the invention.

Referring now to Figure 1, there is shown diagrammatically a portion of a continuous web of wrapper material, usually paper, indicated at 10. The wrapper is fed, by well known means not illustrated, in the direction of the arrow to pass into a rod-forming chamber 12 which guides the side portions of the web into a tubular form in which they pass out of the right-hand end of a continuous rod 14. A filler handling device, diagrammatically indicated at 16, lays a continuous band of tobacco 18 in the center portion of the wrapper to be subsequently enveloped thereby in the rod-forming device 12. The apparatus thus far described is per se well known and forms no part of the present inventin.

In order to form cigarettes which have been treated at their ends only, there is provided an impregnating means comprising a stationary spray nozzle 20 which is positioned above the traveling band 18 and is formed to produce a fan-like spray indicated at 22. A second impregnating device comprising a stationary nozzle 21 is mounted beneath the band 18 to treat the outside of the wrapper. The nozzles 20 and 24 may be supplied with liquid treating medium by means of a suitable plumbing system such as the pipes 26 and 28 which extend from a solenoid valve 30. The latter has a spray pipe 32 leading from a suitable pressure source 34. This may comprise a tank containing the treating liquid and superimposed body of compressed air or other suitable device for supplying the treating liquid under pressure.

In order to insure that the treatment of each cigarette is in a zone located at the end thereof, the impregnating means is controlled from the cigarette manufacturing machine. One preferred way of doing this is from the cutting means indicated diagrammatically at 36 which shears the finished cigarettes from the continuously moving rod 14. Fastened to or otherwise driven by the shaft 38 of the cutter 36 is a commutator disc 40 having a single conducting segment 42 of predetermined arcuate length. The segment 42 serves to bridge between two brushes 44 which are connected in a circuit 46 which includes the solenoid 48 of valve 30 and a suitable electric supply line 50. In operation, the wrapper band 18 and the filler 16 travel continuously to the right forming a continuous rod 14 which is cut into cigarette sections by the cutter 36. These parts are driven by a suitable mechanism not shown as is well known in the art. The segment 42 of commutator 40 is so coordinated with respect to the cutter bar 38 as to energize solenoid 48 at a time which will produce a treated section 52 in a predetermined position on a finished cigarette. Preferably these treated sections are located at one end only of the cigarette as shown in the drawing. It may be desired, however, to arrange them at both ends in which case the relative angular position, of segment 42 and cutter 36 may be appropriately re-located. Alternatively the longitudinal position of the spray nozzles 40 and 44 may be shifted slightly to the left or right if it is desired to...
change the location of the treated portion in the finished cigarette.

Referring now to Figure 2, a modified form of the invention is there shown in which the treatment of the wrapper is performed prior to manufacture of the cigarette. Thus a supply of wrapper paper may be processed by any well known printing device with the appropriate treated sections indicated at 54, thus dispensing with the spray nozzle 24 shown in Figure 1. This type of apparatus is particularly suitable where the treatment of the wrapper is with a liquid different from that used to treat the filler. For example, as where a tipping lacquer or similar material is applied to the wrapper which requires more drying time than is available in the apparatus illustrated in Figure 1.

It will thus be seen that the present invention provides an improved method and apparatus for treating cigarettes which is adapted to high speed production in modern cigarette making machinery and furthermore enables cigarettes to be manufactured with all the advantages disclosed in my prior patent without, however, adding to their manufacturing cost anything more than the minute value of the treating material applied to the cigarette. By the use of a spray as a liquid impregnating device a much shorter drying time is required than is necessary where the cigarette is dipped in liquid as in my prior patent.

I claim:

1. The method of manufacturing a cigarette which comprises directing a continuous stream of filler material onto a wrapper, applying a liquid binding agent as a spray to the moving filler portion at spaced intervals equal to the length of the finished cigarette and prior to enveloping the filler with the wrapper without substantially impairing the free passage of air through the treated portion of the filler.

2. The method of manufacturing a cigarette which comprises directing a continuous stream of filler material onto a wrapper, applying a liquid binding agent as a spray to the moving filler portion while carried by the wrapper at spaced intervals equal to the length of the finished cigarette and prior to enveloping the filler with the wrapper without substantially impairing the free passage of air through the treated portion of the filler.

3. The method of manufacturing a cigarette which comprises intermittently impregnating by spraying a short portion of filler while moving as a stream continuously into an enveloping wrapper with a liquid binding agent which permits the free passage of air through the impregnated portion of the filler.

4. The method of manufacturing a cigarette which comprises intermittently impregnating by spraying a short portion of filler while moving as a stream continuously into an enveloping wrapper with a liquid binding agent which permits the free passage of air through the impregnated portion of the filler, and cutting the wrapped filler rod into lengths at a point adjacent the impregnated portion.

5. In a cigarette making machine of the continuous rod-forming type, the combination with filler feeding and wrapping means and a cut off device of a liquid impregnating device mounted adjacent the path of the filler and arranged to apply a liquid binding agent to said filler and wrapper, and means for operating the impregnating means intermittently in timed relation to operation of the cut off device such that the binding agent is applied to said filler as spaced bands.

6. In a cigarette making machine of the continuous rod-forming type, the combination with filler feeding and wrapping means and a cut off device of a liquid impregnating device mounted adjacent the path of the filler and on the internal side of the wrapper for applying a liquid binding agent to said filler, impregnating means mounted adjacent the path of the wrapper and on the external side thereof, and means for intermittently operating the impregnating means in timed relation to operation of the cut off device to apply binding agent to said filler and wrapper as spaced bands.

7. In a cigarette making machine of the continuous rod-forming type, the combination with filler feeding and wrapping means and a cut off device of a liquid impregnating device comprising a spray nozzle mounted adjacent the path of the filler and on the internal side of the wrapper for applying a liquid binding agent to said filler, a source of liquid containing essentially a binding agent, spraying means for spraying a liquid binding agent with said nozzle, and means for intermittently operating the impregnating means in timed relation to operation of the cut off device to apply spaced bands of liquid binding agent to said filler and the internal side of the wrapper.

8. In a cigarette making machine of the continuous rod-forming type, the combination with filler feeding and wrapping means and a cut off device, of a liquid impregnating device comprising a spray nozzle mounted adjacent the path of the filler, impregnating means comprising a spray nozzle mounted adjacent the path of the wrapper and on the external side thereof, each of said nozzles being connected to a source of liquid binding agent, and means for intermittently operating the impregnating means in timed relation to operation of the cut off device to apply spaced bands of liquid binding agent to said filler.

9. In a cigarette making machine of the continuous rod-forming type, the combination with filler feeding and wrapping means and a cut off device, of a liquid impregnating device comprising a spray nozzle mounted adjacent the path of the filler and connected with a source of liquid adapted to coat the filler material without materially obstructing the free passage of air through the cigarette, and means for operating the impregnating means in timed relation to operation of the cut off device comprising solenoid valve means for supplying liquid to the spray nozzle, and means for intermittently energizing the solenoid valve means in synchronism with the operation of the cut off device to apply bands of liquid binding agent to said filler.

10. The method of manufacturing a cigarette which comprises applying a liquid treating agent to the filler portion at spaced intervals and wrapping the filler with a paper wrapper having pre-treated portions at similarly spaced intervals along its length.

11. The method of manufacturing a cigarette which comprises intermittently spraying a liquid binding agent on a continuous stream of tobacco filler material and subsequently enveloping the filler with a paper wrapper having pre-treated portions at spaced intervals along its length.

12. The method of manufacturing a cigarette which comprises directing a continuous stream of filler material onto a moving web of wrapper material, applying a liquid material as a spray simultaneously to the filler and wrapper material.
at spaced intervals equal to the length of the finished cigarette and prior to enveloping the filler with the wrapper, said liquid material being of a nature to bond the filler material together without substantially impairing the free passage of air through the treated portion of the finished cigarette and to extinguish the cigarette when it burns down to said treated portion.

13. The method of manufacturing a cigarette which comprises directing a continuous stream of filler material on to a moving web of wrapper material, applying a liquid material as a spray to the filler and the internal side of the wrapper material at spaced intervals equal to the length of the finished cigarette and prior to enveloping the filler with the wrapper, said liquid material being of a nature to bond the filler material together without substantially impairing the free passage of air through the treated portion of the finished cigarette and to extinguish the cigarette when it burns down to said treated portion.

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