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MANUFACTURE OF FILTER-TIP CIGARETTES

Filed Feb. 17, 1966

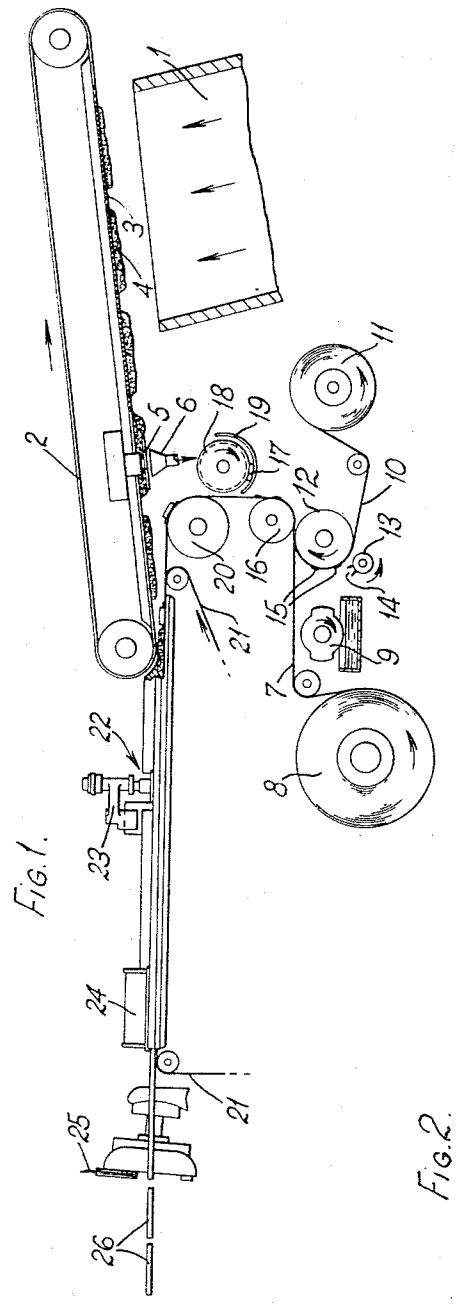

FIG. 1.



FIG. 2.

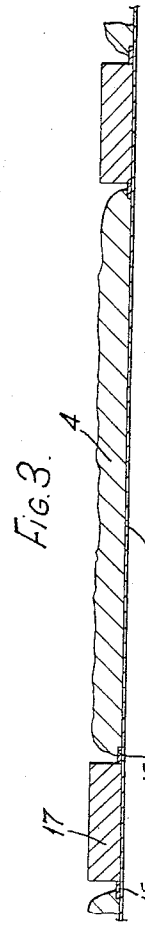

FIG. 3.

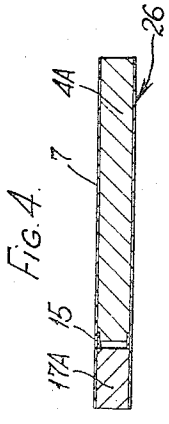

FIG. 4.

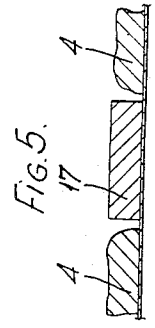

FIG. 5.

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# MANUFACTURE OF FILTER-TIP CIGARETTES

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11 Claims. (Cl. 131—61)

This invention concerns improvements in the manufacture of filter-tip cigarettes.

In the modern manufacture of filter-tip cigarettes two principal methods are used. In one method pieces of wrapped cigarette rod are joined to filters (hereinafter termed stubs) by an external short wrapper adhesively fixed to the two elements, the stubs usually being of twice the length required in the finished cigarettes, each being joined to two cigarette lengths to form an assemblage which is cut into separate filter-tip cigarettes by cutting through the double-length stub. This method produces excellent cigarettes as the elements are finished products before assembly. The other method consists in inserting stubs between portions of loose tobacco filler carried on a conveyor of some kind, often the cigarette paper web, and then wrapping these elements to form a continuous rod consisting of double-length tobacco portions alternating with double-length stubs. This continuous rod is severed midway through each tobacco portion and each stub. This second method requires less machinery than the first but there are several difficulties to be overcome, partly because of the loose nature of the tobacco portions.

As is well known in the art the formation of the continuous rod takes place in rod forming apparatus having a device known as a garniture, and an essential feature of this device is a part called a tongue which presses on the top of the tobacco filler while the paper wrapper of the cigarette rod is being folded around the filler. This tongue therefore tends to drag the stub backwards, and it also pulls back the tobacco which immediately precedes the stub, so that it is sometimes found that tobacco is pulled over the cylindrical surface of the leading end part of the stub. The tongue also tends to drag back the leading edge of the tobacco portion following the stub. Moreover, whatever type of cigarette making machine is employed in the manufacture according to this second method, it is difficult to keep the stub or the part of the cigarette paper web where the stub is to be located free of dust or fragments of tobacco.

The product of the second method referred to is often not as satisfactory as is desirable in that the cigarette is weak, or lacks rigidity, at the part where the inner end of the stub is adjacent the tobacco filler, for it is difficult to ensure that the tobacco filler is tightly packed against the face of the stub, and it is also very difficult to keep strands of tobacco from lying between the exterior cylindrical surface of a stub and the cigarette paper.

It is an object of the present invention to ameliorate these difficulties as far as possible and secure a better product.

According to the invention there is provided a method of making filter-tip cigarettes by feeding stubs in alternation with unwrapped tobacco portions and enclosing the stubs and tobacco portions in a paper web to produce a



composite continuous rod, the said method including the step of securing stiffening strips to the paper web in such manner that a strip lies across the web adjacent each end of a stub, so that when the paper web is folded about the tobacco portions and stubs, the said strips form tubular reinforcements adjacent said stubs. The stubs may also be adhesively secured to the paper web. Preferably the stubs and strips are placed on the web and portions of tobacco are subsequently deposited on the web between the stubs. The lengths and positions of the various elements may be so arranged that each end of a tobacco portion lies over at least part of a strip.

Further according to the invention there is provided apparatus for making filter-tip cigarettes by feeding stubs in alternation with unwrapped tobacco portions and enclosing the stubs and tobacco portions in a paper web to produce a composite continuous rod, the said apparatus including means to feed a paper web continuously endwise, means to supply and secure stiffening strips to said paper web so as to lie across the web, means to supply stubs to said paper web so as to be located with each end of a stub adjacent a strip, means to supply tobacco portions to the web so as to lie between stubs, means to fold and secure the paper web about said stubs and tobacco portions to form a composite continuous rod in which the said strips form tubular reinforcements adjacent said stubs, and means to sever the rod midway through the said stubs and the said tobacco portions to produce individual cigarettes. The apparatus may include means to secure the stubs adhesively to the paper web between the strips. The apparatus may be so arranged that the stubs and strips are applied to the paper web and the said portions of tobacco are deposited on the paper web thereafter.

The apparatus may include a suction conveyor having air-pervious areas on which the tobacco portions are suctionally held on the underside of the conveyor, the said suction conveyor extending partially over the paper web to enable the tobacco portions to be transferred from the suction conveyor to the paper web between the stubs.

The suction conveyor may be air-pervious only over areas corresponding in length to the desired lengths of the tobacco portions, the said areas being separated by plain areas each having a length somewhat in excess of a double-length stub, the apparatus further including means to project tobacco shreds towards said suction conveyor to form the said tobacco portions on the said air-pervious areas only.

The apparatus may include trimming means to trim the said tobacco portions to the desired volume before they are deposited on the paper web.

Further according to the invention there is provided a filter tip cigarette comprising a tobacco portion, a stub, and a tubular stiffening ring abutting the stub, the tobacco portion extending at least partially into said stiffening ring, the tobacco, the stub and the stiffening ring being enclosed in a common tubular paper wrapper, and the stiffening ring being secured by adhesive to the paper.

The invention will be further described with reference to the accompanying drawings in which:

FIGURE 1 is a diagram of a machine of the type described according to the present invention,

FIGURE 2 is a plan of a piece of cigarette paper web showing the position occupied by a double-length stub and a pair of card strips,

FIGURE 3 is a central section of a cigarette paper web showing the locations of the card strips, double-length stubs and double-length tobacco portions,

FIGURE 4 is a central section through a filter tip cigarette made according to the invention, and

FIGURE 5 is a central section of a cigarette web showing the ends of double-length tobacco portions with a double-length filter disposed between them.

Referring first to FIGURE 1 tobacco is projected upwards by an airstream through a passage marked **1** which is sometimes referred to as a chimney. Above the chimney is an endless band conveyor **2** moving in the direction indicated by the arrow and this is positioned to intercept the projected tobacco shreds. The band **2** is perforated at intervals which correspond in length and width to the area to be occupied by a double-length tobacco filler portion. In between the perforated areas there are portions **3** which are unperforated so that tobacco only adheres to the band at positions where it is perforated, the effect being secured by suction through the perforations of the band, to form separate tobacco portions **4**. The shreds build up on the perforated areas to a volume in excess of the desired volume and the lower portions are then trimmed away by a trimmer marked **5** comprising a pair of rotating discs, only one of which is shown. The trimmings fall downwards and are removed, for example, by a suction nozzle indicated at **6**.

A web of cigarette paper **7** is drawn from a reel **8** and patches of adhesive are applied to it at intervals by a gumming device **9**. A web of thin card **10** is also drawn from a reel **11** by means of a suction roller **12** which rotates at a peripheral speed such that narrow strips **15** of card may be cut from the web **10** by a cutter **13** having a pair of blades **14** which are spaced by the width of a strip. Because the roller **12** is moving faster than the web is fed, the strips become spaced as shown and as they move over the top of the roller **12** they become attached to the adhesive coated portions of the web **7**. Owing to the small scale of the drawing the web **7** appears to be touching the roller **12** but in fact it is spaced therefrom by a slight distance so that only the strips **15** will touch and become stuck on to the web. The web bearing the strips then passes around a guide roller **16**, and double-length stubs **17** are fed by a stub feeding device **18** of any known construction, the stubs passing around a concave guide **19** until such time as they reach the web **7**, the relative movement of stub and web being such that a stub becomes adhesively attached to the web **7** in the space between a pair of strips. The web then travels upwards bearing the strips and stub, passing over a guide roller **20** as shown, and is directed towards rod-forming apparatus of known kind bearing the general reference **22**. As the web is about to enter the rod forming apparatus a double-length tobacco filler portion is deposited on the web in the space between two successive stubs and its length is such that it slightly overlies the edges of the card strips, as shown in FIGURE 3. Thereafter the loaded web goes through the rod forming apparatus where the web is wrapped around the elements carried by the web, and adhesive is applied by a device **23** to one side of the web which is then folded down on to the other to form a seam which is dried by a heater at **24** after which the continuous rod thus formed is cut into separate cigarettes by cutting through it at positions such that the double-length stubs and double-length filler portions are bisected. The web and the elements carried thereby are conveyed through the rod-forming apparatus by an endless band **21** in the usual manner.

It will thus be seen from FIGURE 4 that a card strip **15** abuts the inner end of a single-length stub **17A** and the single-length tobacco filler **4A** slightly overlies the edge of the strip remote from the stub so that a small space is left between the stub and the tobacco. In this way tobacco fragments are effectively prevented from lying between the stub and the cigarette paper, and the card strip, which has been formed up into a card ring during the rod forming operation, reinforces this part of a cigarette which is normally weak for the reasons previously stated.



The machine described with reference to FIGURE 1 can also be used to manufacture filter tip cigarettes consisting only of stubs and tobacco filler portions, as shown in FIGURE 5, and in this case it is only necessary to remove the card feeding device or prevent it from working.

What I claim as my invention and desire to secure by Letters Patent is:

**1.** A method of making filter-tip cigarettes by feeding stubs in alternation with unwrapped tobacco portions on to a substantially endless paper web and enclosing the stubs and tobacco portions in the paper web to produce a composite continuous rod, the said method including the step of securing stiffening strips to the paper web in such manner that a strip lies across the web adjacent each end of a stub, so that when the paper web is folded about the tobacco portions and stubs, the said strips form tubular reinforcements adjacent said stubs.

**2.** A method as claimed in claim **1**, including the step of adhesively securing the stubs to the paper web between the said strips.

**3.** A method as claimed in claim **1**, wherein the stubs and strips are placed on the web and portions of tobacco are subsequently deposited on the web between the said stubs.

**4.** A method as claimed in claim **1**, wherein in said stiffening strip securing step, said strips are secured to the paper web in spaced relationship such that each end of a tobacco portion lies over at least part of a strip.

**5.** A method as claimed in claim **1**, wherein said tobacco portions are fed initially with an excess of tobacco over that desired, and including the further step of trimming the said tobacco portions to the desired volume before they are deposited on the paper web.

**6.** Apparatus for making filter-tip cigarettes by feeding stubs in alternation with unwrapped tobacco portions and enclosing the stubs and tobacco portions in a paper web to produce a composite continuous rod, the said apparatus including means to feed a paper web continuously endwise, means to supply and secure stiffening strips to said paper web so as to lie across the web, means to supply stubs to said paper web so as to be located with each end of a stub adjacent a strip, means to supply tobacco portions to the web so as to lie between stubs, means to fold and secure the paper web about said stubs and tobacco portions to form a composite continuous rod in which the said strips form tubular reinforcements adjacent said stubs, and means to sever the rod midway through the said stubs and the said tobacco portions to produce individual cigarettes.

**7.** Apparatus as claimed in claim **6**, including means to secure the stubs adhesively to the paper web between the strips.

**8.** Apparatus as claimed in claim **6**, including means for operating the apparatus such that said stubs and strips are applied to the paper web and the said portions of tobacco are deposited on the paper web thereafter.

**9.** Apparatus as claimed in claim **6**, including a suction conveyor having air-pervious areas on which the tobacco portions are suctionally held on the underside of the conveyor, the said suction conveyor extending partially over the paper web to enable the tobacco portions to be transferred from the suction conveyor to the paper web between the stubs.

**10.** Apparatus as claimed in claim **9**, wherein the suction conveyor is air-pervious only over areas corresponding in length to the desired lengths of the tobacco portions, the said areas being separated by impervious areas each having a length somewhat in excess of a stub, and including means to project tobacco shreds towards said suction conveyor to form the said tobacco portions on the said air-pervious areas only.

**11.** Apparatus as claimed in claim **9**, wherein tobacco is supplied by said tobacco supplying means in excess of

that desired and including trimming means to trim the said tobacco portions to the desired volume before they are deposited on the paper web.


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