Oct. 23, 1934. A. PODMORE 1,977,998

MANUFACTURE OF CIGARETTES

Filed July 21, 1933 2 Sheets-Sheet 1

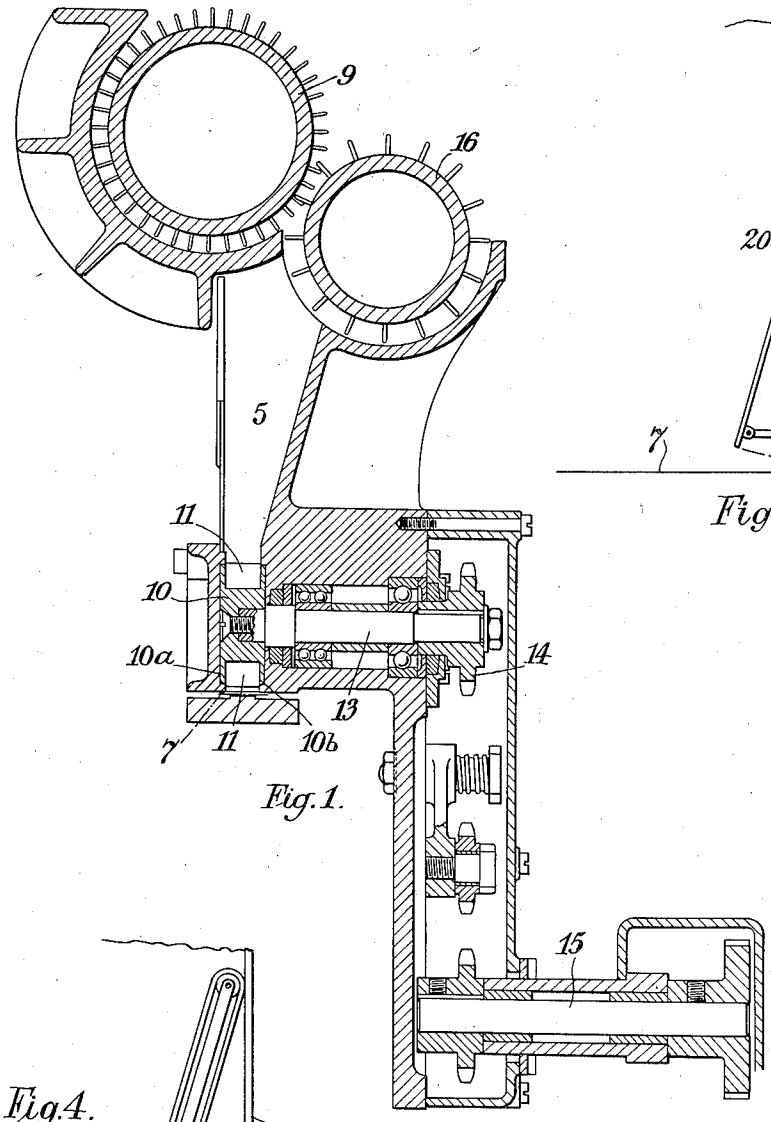

Fig. 1.

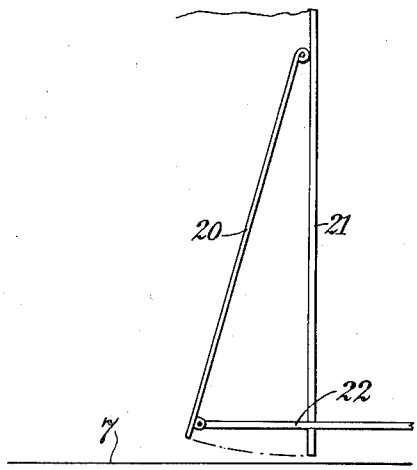

Fig. 3.

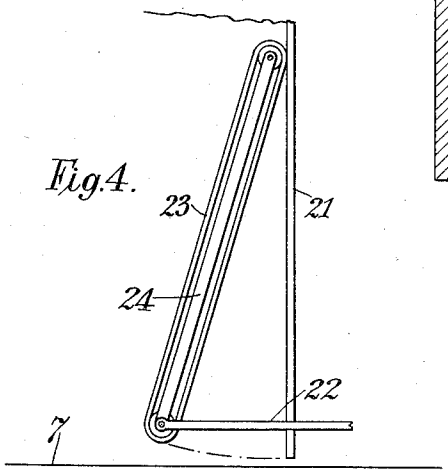

Fig. 4.

Inventor
Arthur Podmore
by Sydney J. Rescott
Attorney

Oct. 23, 1934. A. PODMORE 1,977,998

MANUFACTURE OF CIGARETTES

Filed July 21, 1933 2 Sheets-Sheet 2

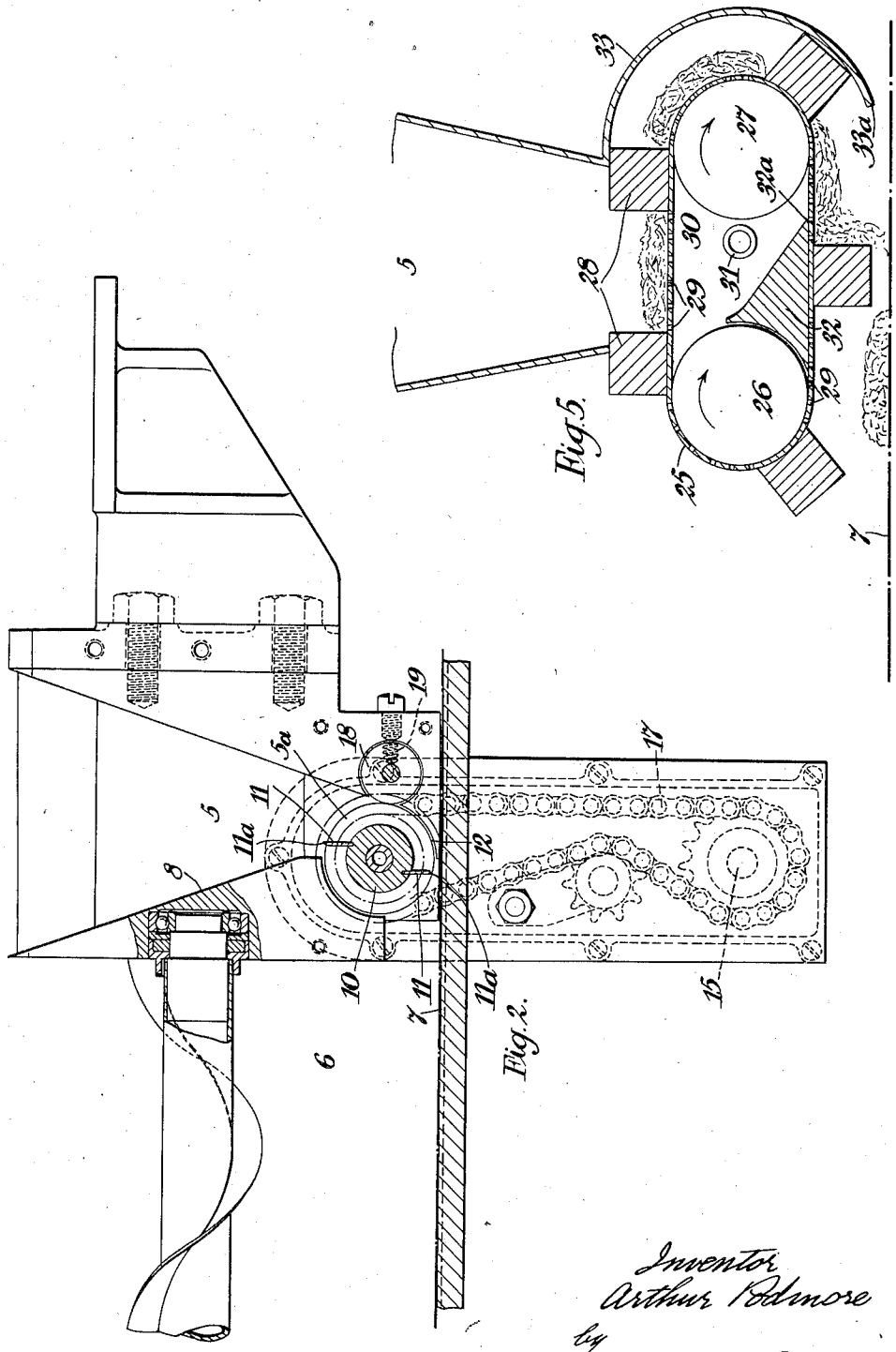

Fig. 5.

Fig. 2.

Inventor
Arthur Podmore
by
Sydney D. Wescott
Attorney

Patented Oct. 23, 1934 1,977,998

UNITED STATES PATENT OFFICE

1,977,998

MANUFACTURE OF CIGARETTES

Arthur Podmore, London, England, assignor to American Machine & Foundry Company, New York, N. Y., a corporation of New Jersey

Application July 21, 1933, Serial No. 681,461
In Great Britain July 26, 1932

14 Claims. (Cl. 131—43)

This invention relates to the manufacture of cigarettes by the continuous rod method and wherein the cigarettes are formed with an end portion or portions in which the tobacco is denser than the remainder of the cigarette, by the feeding of spaced increments of tobacco additional to the normal supply.

The invention may be applied to cigarette making machines in which the tobacco is received upon the cigarette paper web in the form of a shower or sliver or to machines in which the tobacco is received upon a conveyor band (either as a shower or sliver) from which it is transferred to the cigarette paper web.

According to the invention, in the feeding of tobacco to a cigarette rod making machine wherein the rod is formed with alternate dense and less dense portions (corresponding to positions at which the rod will be cut) by the provision of spaced increments of tobacco additional to the normal supply, the increments of tobacco are delivered to the traveling cigarette paper web or the like prior to the delivery of the normal supply.

The invention also consists in imparting to the increments as they are delivered to the cigarette paper web, a movement in the direction of and preferably at the speed of said web.

The increments may be delivered by means of a rotary vaned drum and according to a further feature of the invention the vanes of the drum may be provided with cutting edges adapted to cooperate with a surface to sever any strands of tobacco lying across the vane and thus separate successive increments from one another.

Further features of invention will be hereinafter described and defined in the claims.

The invention will be described by way of example in its application to a tobacco feed in which the tobacco is showered onto the cigarette paper web.

In the accompanying drawings:—

Fig. 1 is a cross section of part of an auxiliary tobacco feed adapted to supply the desired increments to the normal tobacco feed.

Fig. 2 is a front view partly in section of the auxiliary feed and indicating the normal feed chute.

Figs. 3 and 4 diagrammatically illustrate modified methods of producing the dense portions in the cigarette rod.

Fig. 5 diagrammatically illustrates a further form of apparatus in which suction is employed to control the feed of the increments of tobacco.

In carrying the invention into effect according to one convenient mode, and as illustrated in Figs. 1 and 2, an auxiliary tobacco feed is provided comprising a chute 5 which is located at the rear of the main chute 6, whereby the spaced increments of tobacco are received by the cigarette paper web 7 prior to the normal supply of tobacco.

The chute 5 may be constructed as a separate unit or it may be incorporated in the main chute, which may or may not be lengthened for the purpose, the inner wall 8 terminating in a sharp upper edge to direct the desired portion of the shower of tobacco into the auxiliary chute.

The tobacco supply is provided by the pin wheel 9 and picker roll 16 which may comprise extensions of the pin wheel and picker roll adapted to shower tobacco into the main chute or compartment 6.

At the lower end of the chute 5 a drum 10 is provided having side flanges 10*a*, 10*b* and adapted to rotate upon an axis arranged transverse to the direction of movement of the cigarette paper web. The drum is provided with a pair of vanes 11 dividing the drum and co-operating with the curved wall 12 of the chute to form a pair of measuring compartments.

The drum is mounted upon a spindle 13 carrying a sprocket wheel 14 by which it is driven through a chain 17 from an auxiliary shaft 15 from any suitable part, such as the drive from the cigarette cut off.

The drum 10 may be driven continuously or intermittently through suitable mechanism such as a Geneva stop drive.

As viewed in Figure 2 the cigarette web moves from right to left and the drum rotates in a clockwise direction.

As the tobacco is showered into the chute 5 it is directed into the right hand compartment 5*a* by reason of the lower end of the wall 8 being located substantially above the axis of the drum, while the opposite wall is arranged substantially tangential to the drum.

The tobacco lodges on the curved wall 12 from which it is delivered by the vane of the drum onto the paper web.

It will be appreciated that as the upper vane 11 approaches a horizontal position, tobacco will fall onto or rest upon the vane and will move downwardly with the vane. In order to avoid delivering the tobacco from the rear of the vane as the latter passes the delivery edge of the curved wall 12, the vanes are provided with a cutting edge 11*a* adapted to co-operate with a pressure roll 18 whereby any shreds of tobacco lying across the edge of the vane will be severed when the

vane engages the roll so that the increments of tobacco lying in front of and to the rear of each vane will be entirely separate from one another.

The shaft of the roll 18 is mounted in slots and springs 19 are provided to permit the roll to yield when engaged by the vanes 11.

The increments of tobacco as measured by the drum 10 are delivered in spaced relation upon the cigarette paper web as the latter travels past the delivery edge of the wall 12 and then the web receives the normal supply from the chute 6, whereby the cigarette rod is formed with uniformly occurring irregularities in the density of the tobacco, so that when the rod is severed into cigarette lengths each cigarette will be formed with denser portions at its ends, the increments of tobacco, as will be understood, being delivered at the positions along the rod corresponding to the severance of the rod.

It will be obvious that instead of spacing the increments of tobacco to correspond to cigarette lengths, the spacing may be arranged to produce a rod having denser portions corresponding to two cigarette lengths, so that the cigarettes will be produced having only one dense end.

The speed of rotation of the drum 10 may be such that the increment of tobacco as it is delivered to the cigarette paper web moves at substantially the speed of the web.

In carrying the invention into effect according to a modified arrangement, an oscillating surface or element 20, see Figure 3, may be provided in the tobacco chute 21, into which the tobacco is showered. The element is pivotally mounted at its upper end while its lower end extends into proximity but not in contact with the cigarette paper web 7. The element oscillates in the direction of the paper web feed and is adapted to intercept a portion of the shower of tobacco and cause it to be delivered to the paper web in spaced heaps or waves.

As the paper travels through the trough and receives the main shower these spaced heaps or waves effect the desired uniformly occurring irregularities in the density of the cigarette rod.

The oscillations of the surface or element 20 may be effected by coupling it by a link 22 to any suitable actuating element or drive, such as eccentrics, cranks or the like.

It will be appreciated that the oscillating element will be timed to synchronize with the cut-off device so that the heaps or waves of tobacco will correspond to the position of the cut whereby the cigarettes will be formed with denser end portions.

The oscillating element may comprise a chute or a spring steel member, or as illustrated diagrammatically in Figure 4, may comprise an endless travelling band 23 mounted on an oscillatable frame 24 and driven in any suitable manner. The frame is coupled to a crank or eccentric by a link 22.

According to a further modification (see Figure 5) the auxiliary supply of tobacco adapted to form the added increments is delivered into the chute 5 and is received upon an endless travelling band or conveyor 25 which is supported upon spaced end rolls or drums 26, 27 mounted to rotate upon axes transverse to the direction of feed of the cigarette paper web. The conveyor is provided with a series of spaced blocks 28, the conveyor intermediate such blocks being provided with perforations 29.

The conveyor is mounted between side walls so as to form a suction chamber 30 into which a suction pipe 31 projects such pipe being coupled to a pump or other suitable source of suction.

Located within the suction chamber is a baffle 32 within which the inner face of the conveyor 25 contacts, the arrangement being such that as the perforations pass the edge 32*a* of the baffle suction will be cut off and a shield 33 is provided concentric with the axis of the drum 27 and encloses the part of the conveyor which functions to convey the increments of tobacco.

The conveyor 25 may be driven intermittently or continuously.

In operation, tobacco from suitable carding mechanism is delivered or showered into the chute and is received upon the conveyor 25 within the space between a pair of blocks 28. The tobacco is retained on the conveyor by the suction and is thus prevented from falling into a heap as the conveyor passes around the drum 27. As the conveyor passes the edge 32*a* of the baffle the perforations 29 are covered whereby the tobacco is released and falls onto the travelling paper web 7 or other travelling band so that the increment of tobacco is spread out to the desired amount on such webs. Any shreds of tobacco not adhering to the conveyor as it passes around the drum 27 will be caught by the shield 33 and is delivered therefrom by the appropriate block 28 over the delivery edge 33*a*.

According to a further modification, a bucketed wheel may be provided at the front end or the rear end of the chute, such wheel being mounted to rotate upon an axis transverse to the direction of movement of the cigarette paper web. As the wheel rotates the buckets are filled with tobacco from the shower or from an independent supply and the buckets deliver the tobacco therein onto the cigarette paper web at spaced points and thus provide spaced increments of tobacco to the normal feed, whereby the desired variation of density is secured. The bucket wheel may operate within the ends of the chute or in a separate compartment adjacent such ends.

It is to be noted that the auxiliary tobacco feed may be controlled in such a manner that instead of delivering spaced increments which are distinct and separate from one another, a more or less continuous delivery may take place which, however, is such that it assumes a wave-like form when on the band or web of paper, adapted to produce a cigarette rod having the denser and less dense portions.

The invention is not limited to the details set out above, by way of example, as such may be altered in various ways with a view to obtaining the adjustments in the tobacco feed necessary to produce the variations of density of the tobacco in the cigarette rod.

I claim:

1. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions.

2. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause

the cutting mechanism to sever the rod in the middle of the dense portions, said means being operative to deliver said increments to said mechanism while moving in the direction of rod movement.

3. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means being operative to deliver said increments to said mechanism while moving in the direction of rod movement and at the same speed.

4. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, the delivery point of said means being located close to the unloaded paper web moving into said mechanism to effect delivery of the increments to the web without dropping them.

5. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means acting to force said increments in compact form onto the paper web moving into said mechanism.

6. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including cutting means for insuring complete separation of successive increments.

7. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including a rotating device carrying increment separating knives.

8. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including a rotating device carrying increment separating knives, and a spring-pressed roller coacting with said knives.

9. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including a vaned drum and a coacting curved wall arranged to deliver increments to said mechanism while moving in the direction of rod movement.

10. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including a vaned drum and a coacting chute provided with a wall arranged to partially shield the upper surface of the drum and to direct falling tobacco onto the feed side of the drum.

11. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including an oscillating deflector arranged to intercept falling tobacco and deliver it to said mechanism in separated increments.

12. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including an oscillating and traveling belt intercepting falling tobacco and delivering it to said mechanism in separated increments.

13. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including a suction conveyor and a suction cutoff controlling delivery of said increments to said mechanism.

14. The combination with cigarette rod forming and cutting mechanism, of means for successively providing said mechanism prior to the formation of the rod with separated increments of tobacco for addition to the normal supply to enable said mechanism to produce supernormal dense rod portions at intervals timed to cause the cutting mechanism to sever the rod in the middle of the dense portions, said means including an endless perforated conveyor, a suction chamber over and under which said conveyor runs, increment measuring devices carried by said conveyor, and a baffle within said chamber for cutting off suction from the under run of said conveyor to cause discharge of increments of tobacco held thereon.

ARTHUR PODMORE.