Aug. 4, 1942. W. F. M. EDWARDS 2,291,890

MANUFACTURE OF CIGARETTES

Filed Aug. 13, 1940 6 Sheets-Sheet 1

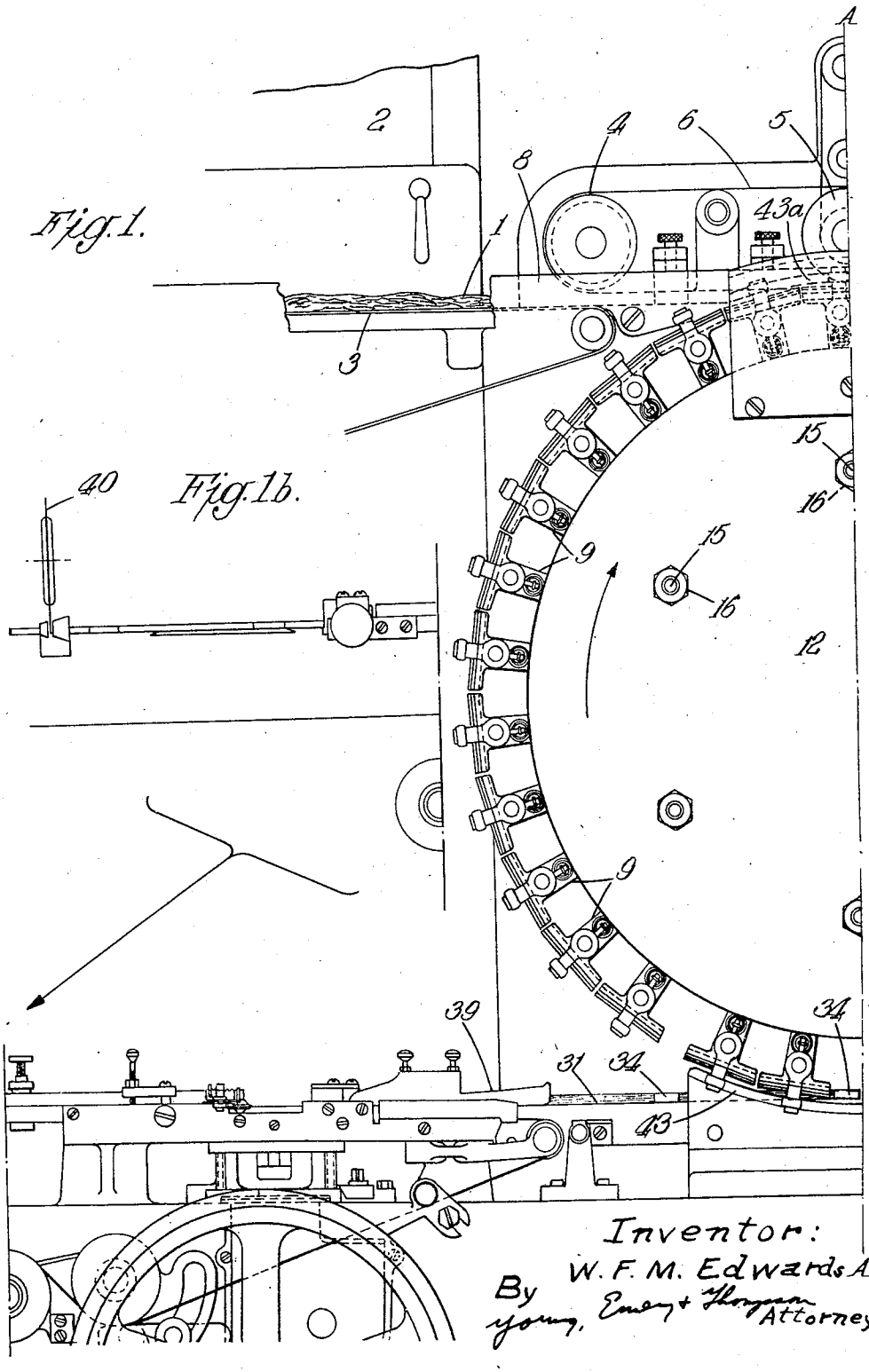


Fig. 1.

Fig. 1b.

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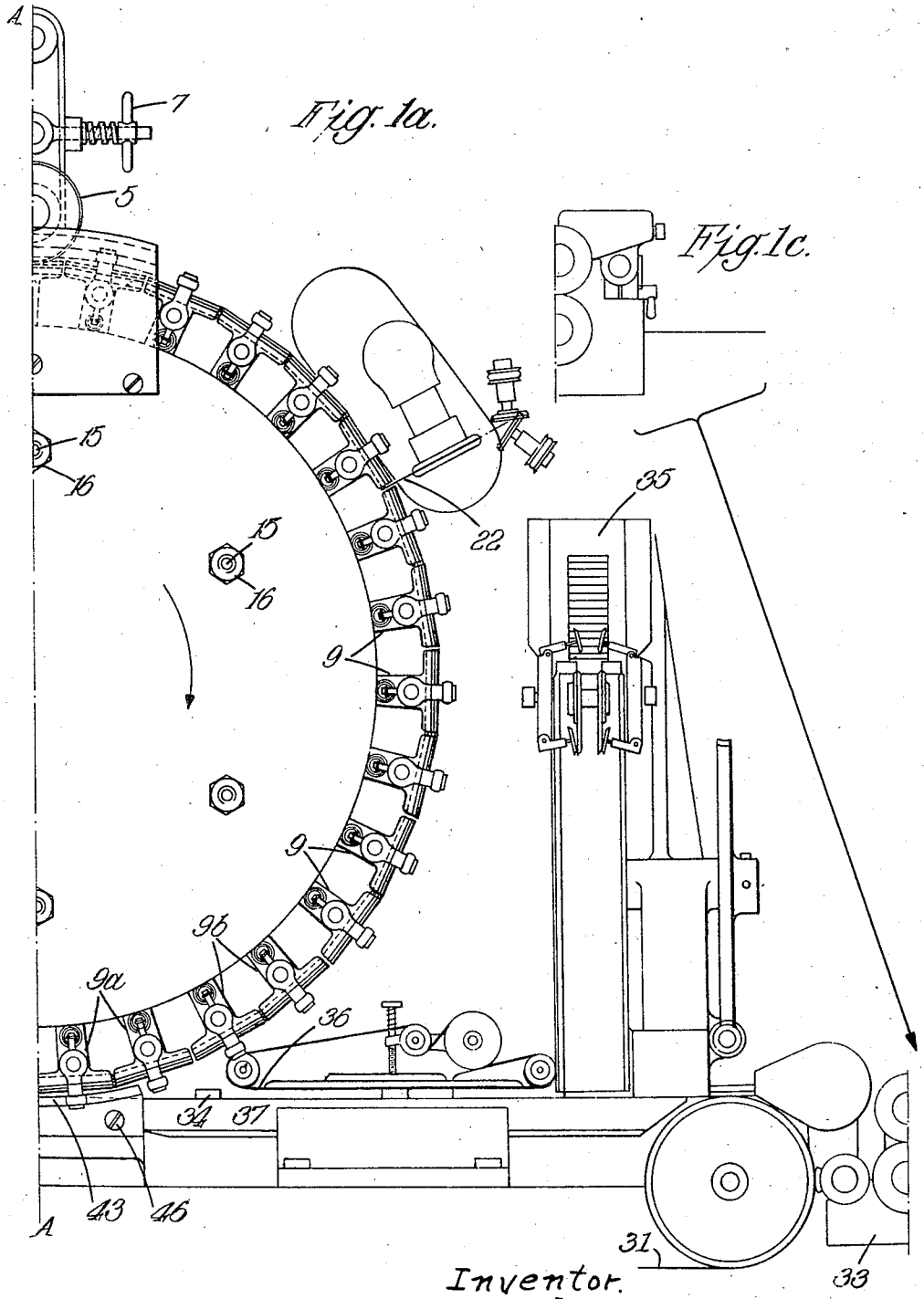


Fig. 1a.

Fig. 1c.

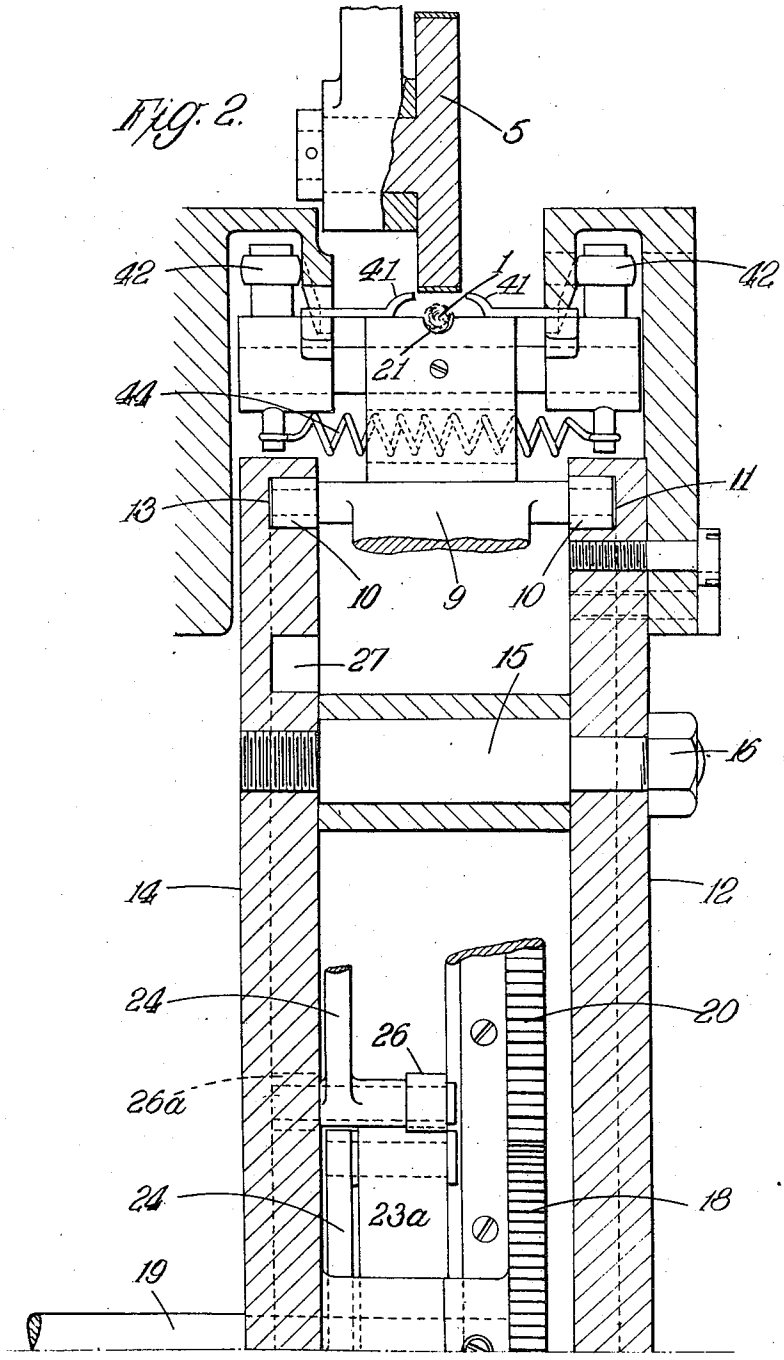
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MANUFACTURE OF CIGARETTES

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Fig. 2.



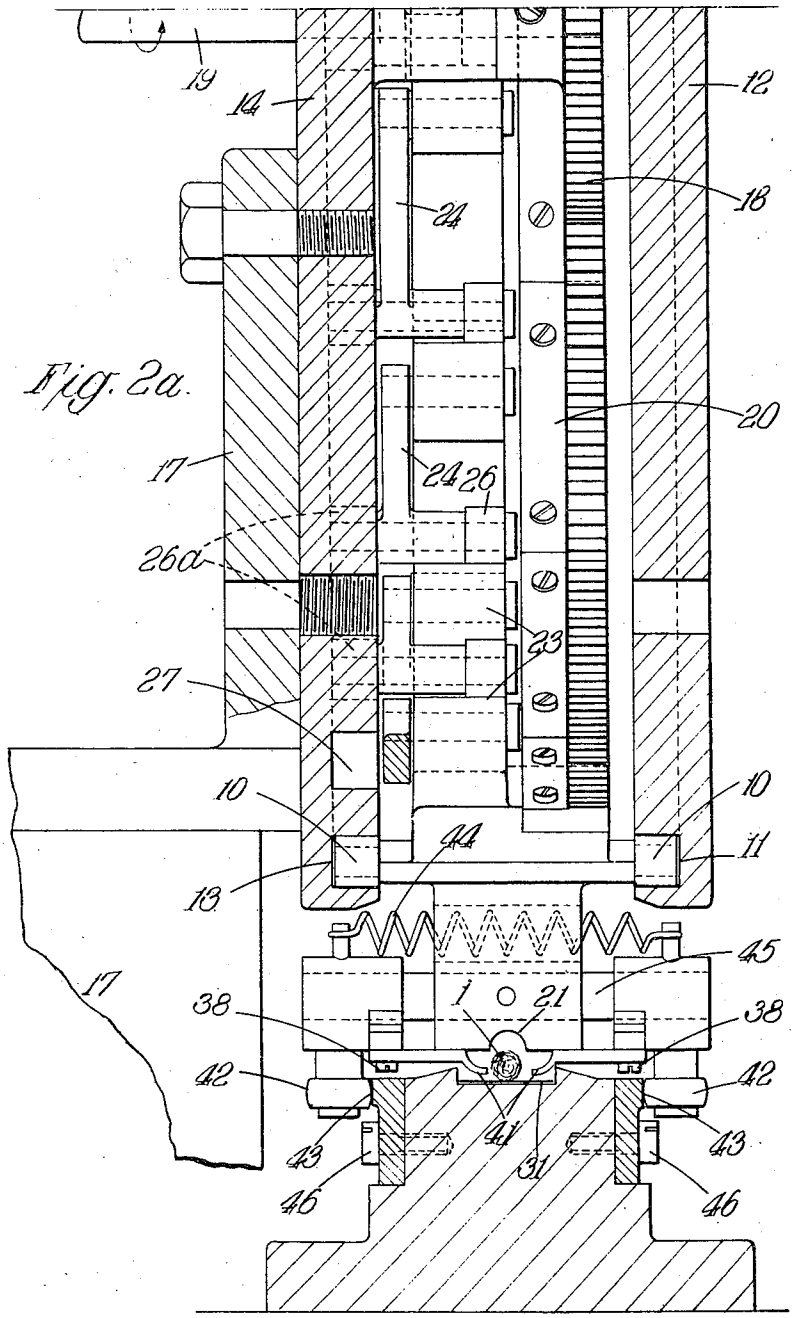
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MANUFACTURE OF CIGARETTES

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Fig. 2a.



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MANUFACTURE OF CIGARETTES

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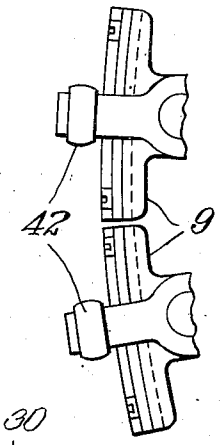
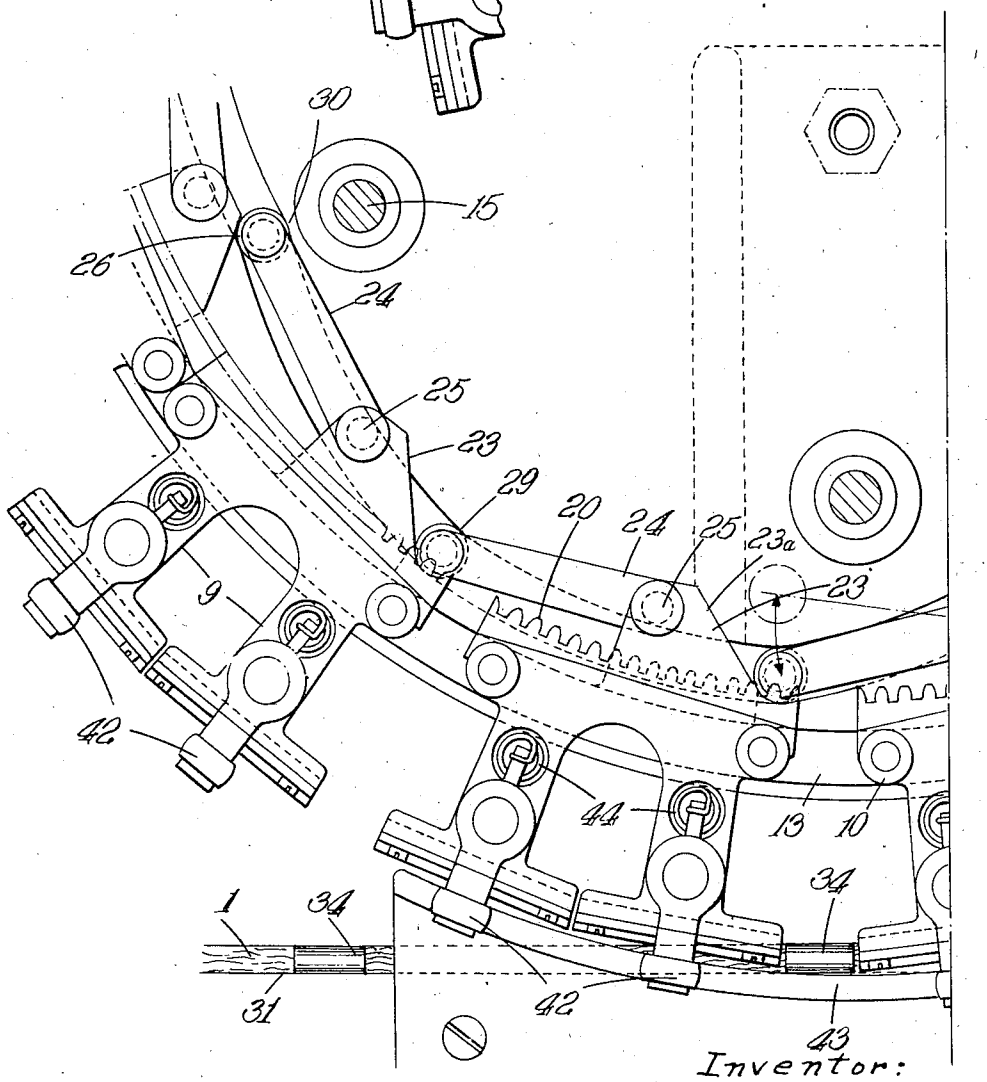


Fig. 1d.

Fig. 3.



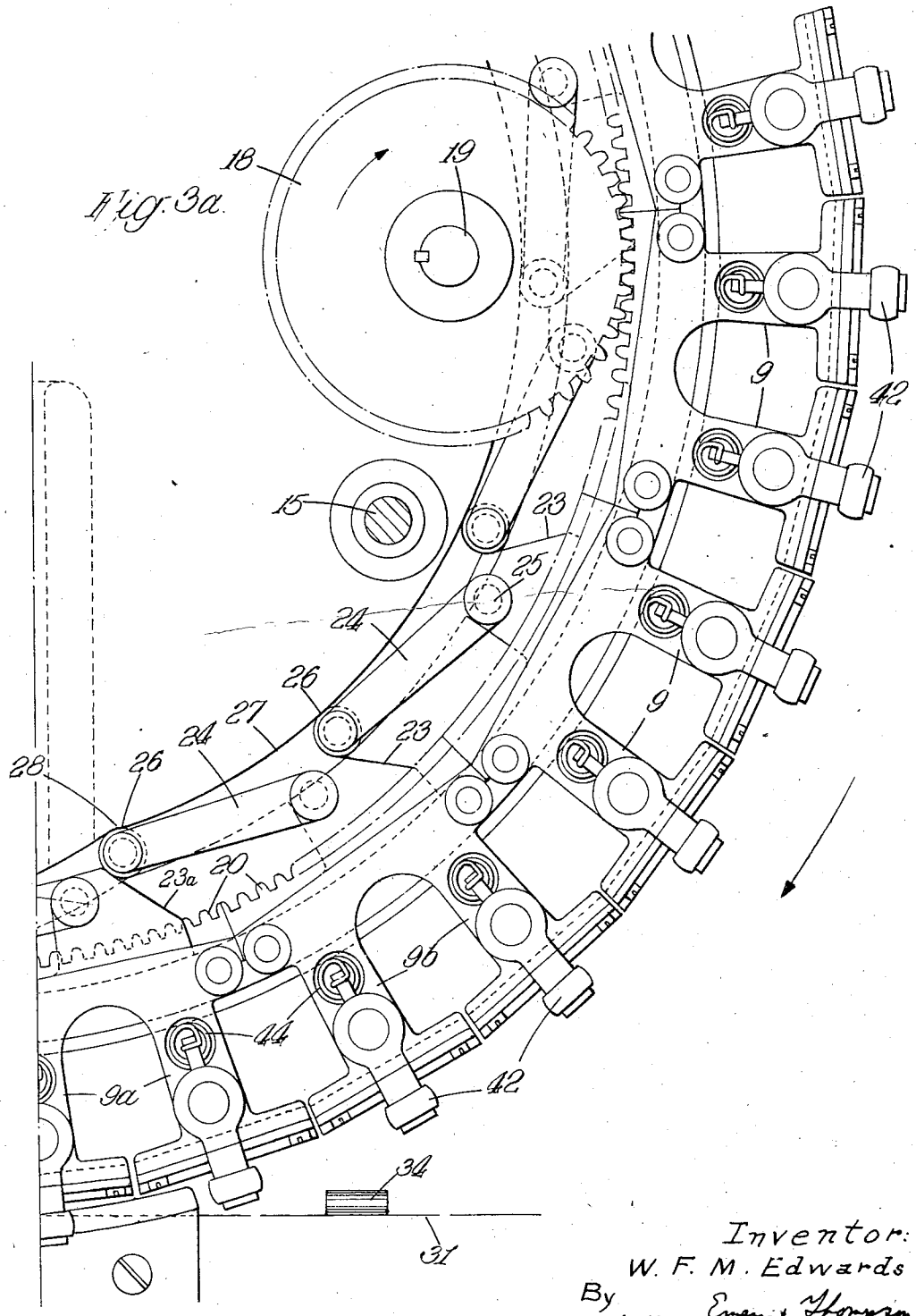
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MANUFACTURE OF CIGARETTES

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Fig. 3a.



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UNITED STATES PATENT OFFICE

2,291,890

MANUFACTURE OF CIGARETTES

William Frederick Maitland Edwards, Esher, England, assignor to Filter Tips Limited, London, England

Application August 13, 1940, Serial No. 352,460
In Great Britain September 19, 1939

20 Claims. (Cl. 131—61)

This invention relates to cigarettes and is particularly concerned with improvements in the manufacture of filter tip cigarettes utilising a machine of the continuous rod type.

According to this invention a method is provided for the production of filter tip cigarettes by the formation of spaces for the reception of filter tips in a continuous tobacco filling, in which a continuous length of tobacco is fed onto a rotating composite circular member, the length is severed into portions and the severed portions are separated from one another by arcuate relative motion so as to form spaces between them.

The invention further includes a machine for manufacturing filter tip cigarettes which comprises a circular rotatable member, means such as a hopper for supplying a continuous length of tobacco thereto and means for severing the length of tobacco into portions and separating the severed portions from one another by arcuate relative motion so as to form spaces between them.

The tobacco may be severed by the arcuate relative motion, but it is preferred to employ cutting means such as one or more knives for this purpose. The tobacco may be severed into portions corresponding in length to the tobacco portion of a filter tip cigarette and the space between adjacent severed portions may be arranged to receive a single length of filter tip material.

Preferably however the severed portions will correspond in length to the combined tobacco portions of two filter tip cigarettes and the space between adjacent portions will be arranged to receive a double length of filter tip material.

The lengths of filter tip material may be arranged by any desired means in the spaces between adjacent severed tobacco portions. Preferably the severed portions are transferred from the rotatable circular member to a moving web of paper, and lengths of filter tip material are placed upon the web at spaced intervals by known means before, at the same time as, or after the tobacco portion is transferred to the web in such a way that the length of filter tip material lie in the required position.

If desired the lengths of filter tip material and the tobacco portions which are now in proximity to each other may be moved relatively to each other to effect abutment.

The web of paper is then folded around the tobacco portions and the lengths of filter tip material to form a continuous rod in the usual manner. Thereafter, also by known means, the rod is cut at appropriate places to form cigarettes of the desired length.

The circular rotatable member may be arranged vertically or at any desired inclination.

In a preferred embodiment, a vertical rotatable circular member is employed, built up of a number of carrier members each provided with a peripheral groove for receiving the tobacco lengths. The carrier members are constrained to move relatively to one another in the plane of the circular member about the axis thereof, for example by cam means.

As a carrier member reaches the top of the rotating circular member it is in close proximity to its adjacent carrier members and the length of tobacco is fed onto it. As the tobacco length moves round on the circular rotating member, a reciprocating rotating knife of the usual kind severs it between each adjacent carrier member and each successive carrier member carrying a severed length is successively accelerated away from the following carrier member so that on reaching the bottom of the circular member a space approximately equal to the length of the filter tip material has been formed between the severed tobacco lengths carried on adjacent carrier members. After the severed tobacco lengths carried by each carrier member have been released each successive and empty carrier member on passing the bottom of the circular member is successively decelerated to permit the following carrier member to approach it, so that by the time the top of the circular member is again reached adjacent carrier members are in contact or close proximity to one another.

The tobacco lengths are held in the peripheral grooves either by suction and/or preferably by releasable clamping means mounted on the carrier members. At the appropriate moment the suction is cut off, and/or the clamping means released so as to deposit the tobacco lengths upon the moving web.

If desired the length of tobacco may be subjected to the action of a compresison wheel or wheels before, during or immediately after the tobacco is fed onto the rotating member.

A preferred embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Fig. 1, 1*a*, 1*b* and 1*c* is a side view of the machine according to the invention partly in section;

Fig. 1*d* is a fragmentary detail view of a modified form of structure;

Fig. 2 and 2a is a section on an enlarged scale on the line A—A of Fig. 1, and

Fig. 3 and 3a is a side view of part of the machine partly in section and on an enlarged scale.

Referring to the drawings:

A continuous rod of tobacco 1 is supplied from a hopper 2 to a conveyor belt 3 which passes it under compression wheels 4 and 5 and compression band 6, the compression being varied as desired by the tension spring 7. The tobacco rod is then guided by the ramp 8 on to the periphery of a rotating circular member which is made up of a number of carrier members 9 joined together in pairs and running on rollers 10 in a circular track 11 cut in the plate 12 and a circular track 13 cut in the plate 14, the two plates being joined together by bolts 15 and nuts 16 and carried by the bracket 17. The carrier members 9 are driven by the gear wheel 18 rotatably mounted on the shaft 19 and meshing with the teeth 20 of the carrier members 9. The tobacco rests in the peripheral channels 21 in the carrier members 9 and is gripped in the said channels by means which are described in detail hereinafter. The tobacco is severed by a reciprocating cutter knife 22 of conventional design which operates in the space between adjacent carrier members into portions of substantially the combined length of the tobacco portions of two filter tip cigarettes.

The top of each carrier member is provided with a cam 23 and a link 24 pivotally attached at 25 to the cam 23. The free end of each link 24 is provided with rollers 26 and 26a, the latter of which runs in the cam track 27 cut in the plate 14.

The cam track 27 is circular over the greater part of its path but extends outwardly somewhat between points 28 and 29 and between points 29 and 30. On reaching the point 28 the roller 26a in the cam track 27 moves outwards, and thereby the roller 26 runs down the face 23a of the cam 23 and thus the carrier member 9a is accelerated away from the next succeeding carrier member 9b to form a space by relative arcuate movement. At the point 29 the cam track 27 moves inwards with resulting deceleration of the carrier member 9a and at the point 30 the track 27 resumes its circular course. On reaching the lowermost part of their travel each carrier member deposits its portion of tobacco by the action of releasing means hereinafter described and the tobacco is deposited upon a moving web of paper 31 fed from a bobbin in the usual manner. The paper is gummed at spaced intervals by a gumming unit 33 of the usual kind and wads 34 of twice the length required for a filter tip cigarette are deposited on the gummed portions of the paper from the wad hopper 35 also of the usual kind, leaving a space between successive wads of substantially the combined length of the tobacco portions of two filter tip cigarettes. The guide tape 36 serves to hold and align the wads on the paper and the heated platform 37 dries the gum and fixes the wads to the paper. The timing is such that each carrier member at the time it releases the tobacco is travelling at the same linear velocity as the paper 31 and so that the released portions of tobacco are deposited between the wads. The whole assembly then passes through a garniture 39 of the usual kind and the continuous rod thus formed is divided into individual cigarettes by the knife 40 in the usual manner.

It will be understood that the shape of the track 27 ensures that each carrier member is accelerated between the points 28 and 29 and decelerated in turn between points 29 and 30 and that the gaps will always occur and disappear at the same positions.

The action of the releasing device is as follows: In the position shown at the bottom of Fig. 2a the tobacco has just been released from the groove 21 from between the retractable tobacco gripper plates 41 which have been drawn apart by the motion of the gripper carrier rollers 42 in passing over the arcuate cam tracks 43. Before the cam tracks 43 act the gripper plates 41 grip the tobacco by the action of the tension spring 44 moving along the guide rod 45. The gripper plates may be adjusted for properly gripping the bacco 1 by means of the screws 38 and the amount of release or lateral movement of these plates may be regulated by screws 46 acting on cam tracks 43.

In the position shown at the top of Fig. 2a the retractable tobacco gripper plates 41 have been drawn apart by the motion of the gripper carrier rollers 42 in passing over arcuate cam tracks 43a. Before the cam tracks 43a act the gripper plates 41 close the plates 41 by the action of the tension spring 44 moving along the guide rod 45.

The term "rotatable circular member" as used herein is to be understood as including the rotatable polygonal member illustrated in Figs. 1, 1a, 1b and 1c. The grooved surfaces of the carrier members described above may be curved as shown in Fig. 1d, representing arcs of a circle having its centre at the axis of the rotating member. Moreover the arcuate relative motion between the severed portions is to be understood as including a relative motion which in addition to an arcuate component may contain a radial component of motion.

The expression "filter tip material" as used herein comprises filter tips, wads or plugs of any desired material or combination of materials, either wrapped or unwrapped, and also includes tubes which may be empty or filled or partially filled with filtering material and/or tobacco.

The expression "cigarettes" as used herein comprises cigarettes of the usual length or lengths of cigarette rod shorter or longer than the usual cigarettes.

What I claim is:

1. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco in a circular path, severing the length into portions and separating the portions from one another by relative motion in said path so as to form spaces between them.

2. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco in a vertically disposed circular path, severing the length into portions and separating the portions from one another by relative motion in said path so as to form spaces between them.

3. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco in a circular path, severing the length into portions, separating the portions from one another by relative circumferential motion while they are still in said path so as to form spaces between them and transferring the said tobacco portions from the circular path to a moving web of paper in such a way that each portion is disposed between two lengths of filter tip material.

4. In a method for the production of filter tip

cigarettes the steps of moving a continuous length of tobacco in a circular path, severing the length into portions, separating the portions from one another by relative circumferential motion while they are still retained in said path so as to form spaces between them and transferring the spaced apart portions from the circular path to a moving web of paper upon which lengths of filter tip material are located at spaced intervals in such a way that each tobacco portion is disposed between two lengths of filter tip material.

5. A method for the production of filter tip cigarettes which comprises moving a continuous length of tobacco in a circular path, severing the length into portions, separating the portions from one another by relative circumferential motion while they are still retained in said path so as to form spaces between them, trnasferring the spaced apart portions from the circular path to a moving web of paper upon which lengths of filter tip material are located at spaced intervals in such a way that each tobacco portion is disposed between two lengths of filter tip material, to form an assemblage of alternate tobacco portions and portions of filter tip material, wrapping and securing the web of paper around the assemblage to form a continuous rod and dividing the said rod into filter tip cigarettes.

6. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member, means for supplying a continuous length of tobacco thereto, means for severing the length of tobacco into portions and means for separating the severed portions from one another by relative circumferential motion while they are still retained by the circular member so as to form spaces between them.

7. In a machine for manufacturing filter tip cigarettes the combination of a rotatable vertically disposed circular member, means for supplying a continuous length of tobacco thereto, means for severing the length of tobacco into portions and means for separating the severed portions from one another by relative circumferential motion while they are still retained by the circular member so as to form spaces between them.

8. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member, means for supplying a continuous length of tobacco thereto, means for severing the length of tobacco into portions, means for separating the severed portions from one another by relative circumferential motion while they are still retained by the circular member so as to form spaces between them and means for transferring the said tobacco portions from the rotatable circular member to a moving web of paper in such a way that each portion is disposed between two lengths of filter tip material.

9. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member, means for supplying a continuous length of tobacco thereto, means for severing the length of tobacco into portions, means for separating the severed portions from one another by relative circumferential motion while they are still retained by the circular member so as to form spaces between them and means for transferring the severed portions of tobacco from the rotatable circular member to a moving web of paper having lengths of filter tip material disposed thereon at spaced intervals in such a way that the lengths of filter tip material and the severed portions of tobacco are disposed alternately.

10. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member, a hopper to supply a continuous length of tobacco thereto, clamping means for holding the tobacco onto the rotatable circular member, a knife to sever the length of tobacco into portions, means for separating the severed portions from one another by relative circumferential motion while they are still retained by the circular member so as to form spaces between them, means to release the portions of tobacco from the clamping means at a predetermined point for the purpose of transferring the portions of tobacco to a moving web of paper having lengths of filter tip material disposed thereon at spaced intervals the arrangement being such that after the transfer of the portions of tobacco to the moving web of paper the lengths of filter tip material and the severed portions of tobacco are disposed alternately.

11. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member built up of a plurality of grooved carrier members adapted to receive tobacco, means for driving said carrier members, means for supplying a continuous length of tobacco to said rotatable circular member, means for severing the length of tobacco into portions and means for separating said carrier members from one another by relative arcuate motion so as to form spaces between the severed lengths of tobacco.

12. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member built up of a plurality of peripherally grooved carrier members adapted to receive tobacco, means for driving said carrier members, a hopper for supplying a continuous length of tobacco to said rotatable circular member, a knife for severing the length of tobacco into portions and cam means for constraining the carrier members to move relatively to one another in the plane of the circular member about the axis thereof so as to form spaces between the severed lengths of tobacco.

13. In a machine for manufacturing filter tip cigarettes the combination of a rotatable circular member, a hopper to supply a continuous length of tobacco thereto, gripper members for holding the tobacco onto the rotatable circular member, a knife to sever the length of tobacco into portions, means for separating the severed portions from one another by relative circumferential motion while they are still retained by the circular member so as to form spaces between them, a cam mechanism to release the portions of tobacco from the gripper members at a predetermined point for the purpose of transferring the portions of tobacco to a moving web of paper having lengths of filter tip material disposed thereon at spaced intervals the arrangement being such that after the transfer of the portions of tobacco to the moving web of paper the lengths of filter tip material and the severed portions of tobacco are disposed alternately.

14. A machine for manufacturing filter tip cigarettes comprising a vertically disposed rotatable circular member built up of a plurality of peripherally grooved carrier members adapted to receive tobacco, a gear wheel for driving said carrier members, a hopper for supplying a continuous length of tobacco to said rotatable circular member, a knife for severing the length of tobacco into portions, releasable clamping means

comprising gripper plates for holding the tobacco in the peripheral grooves of the carrier members, a cam on the inner end of each carrier member, a link pivotally attached to each of said cams, and a roller at the free end of each of said links, a plate having a cam track therein in which said rollers are constrained to move, part of said cam track being of such an outline that the rollers are caused to run down the face of the cam of the preceding carrier member to form spaces between the severed lengths of tobacco, cam mechanism to open the gripper plates and release the portions of tobacco at a predetermined point for the purpose of transferring the portions of tobacco from the carrier member to a moving web of paper having lengths of filter tip material disposed thereon at spaced intervals the timing being such that after the transfer of the portions of tobacco to the moving web of paper the lengths of filter tip material and the severed portions of tobacco are disposed alternately to form an assemblage of alternate tobacco portions and portions of filter tip material, a garniture tube for wrapping the web of paper around the assemblage, means for securing the web of paper around the assemblage to form a continuous rod, and a knife for dividing the assemblage into filter tip cigarettes.

15. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco rod in a circular path, severing the length into portions, and separating the portions from one another by accelerating the movement thereof in said circular path.

16. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco rod in a circular path, severing the length into portions, and separating the portions from one another by moving them circumferentially away from each other in said circular path.

17. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco rod in a circular path, severing the length into portions, separating the portions from one another by moving them circumferentially away from each other in said circular path, and discharging said separated portions radially from the circular path.

18. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco rod in a circular path, severing the length into portions, separating the portions from one another by moving them circumferentially away from each other in said circular path, moving a web tangentially to said circular path, and discharging said separted portions radially from the circular path onto said web.

19. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco rod in a circular path, severing the length into portions, separating the portions from one another by moving them circumferentially away from each other in said circular path, moving a web tangentially to said circular path, depositing filter elements at spaced intervals on said web, and discharging said separated portions radially from the circular path onto said web between said filter elements.

20. In a method for the production of filter tip cigarettes the steps of moving a continuous length of tobacco rod in a circular path, severing the length into portions, separating the portions from one another by moving them circumferentially away from each other in said circular path, moving a web tangentially to said circular path, depositing filter elements at spaced intervals on said web, discharging said separated portions radially from the circular path onto said web between said filter elements, and wrapping said web about the assemblage of tobacco portions and filter elements to form a filter tip cigarette rod.

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