July 24, 1962 W. RICHTER 3,045,681

DEVICE FOR PRODUCING A CONTINUOUS TOBACCO ROD

Filed Feb. 2, 1960 4 Sheets-Sheet 1

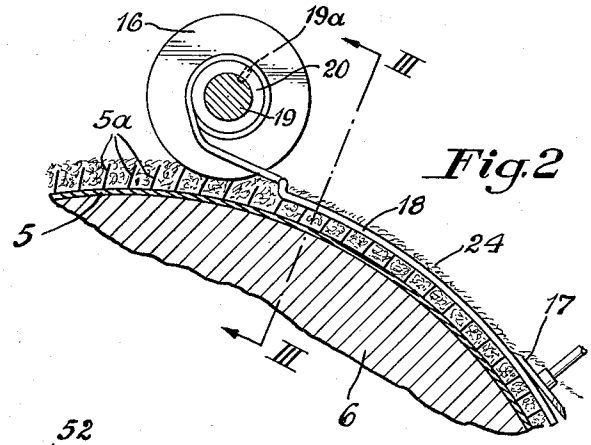


Fig. 2

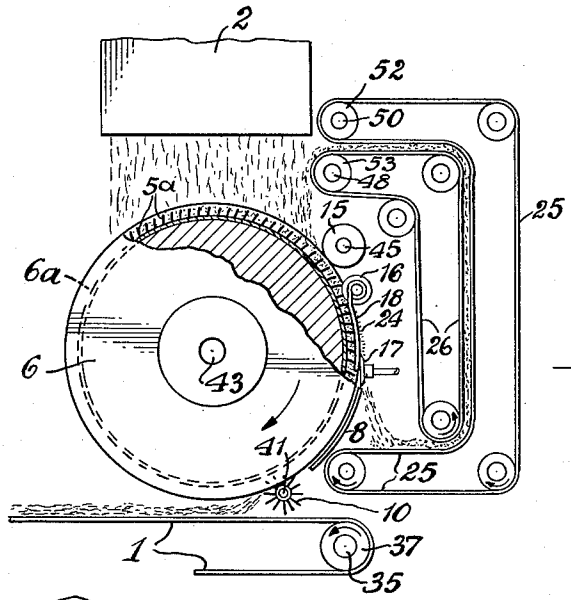


Fig. 1

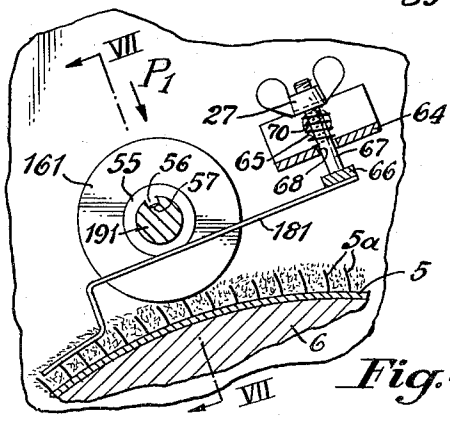


Fig. 4

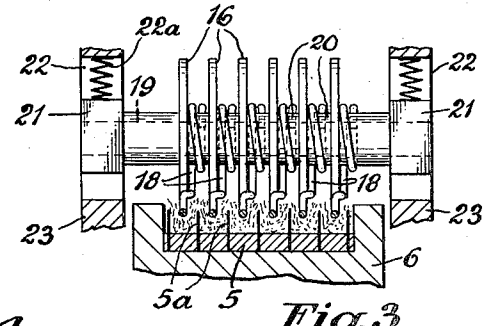


Fig. 3

DEVICE FOR PRODUCING A CONTINUOUS TOBACCO ROD

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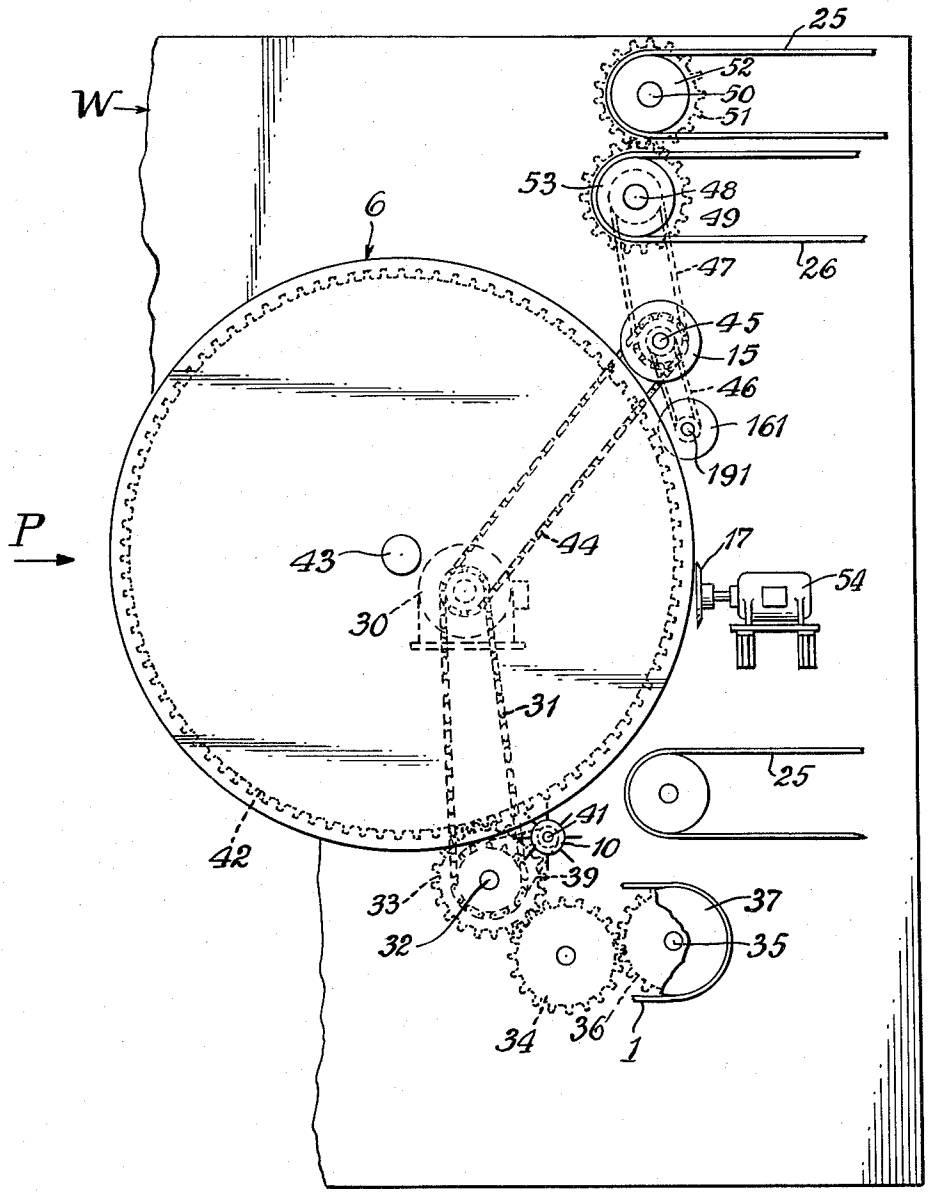


Fig. 5

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DEVICE FOR PRODUCING A CONTINUOUS TOBACCO ROD

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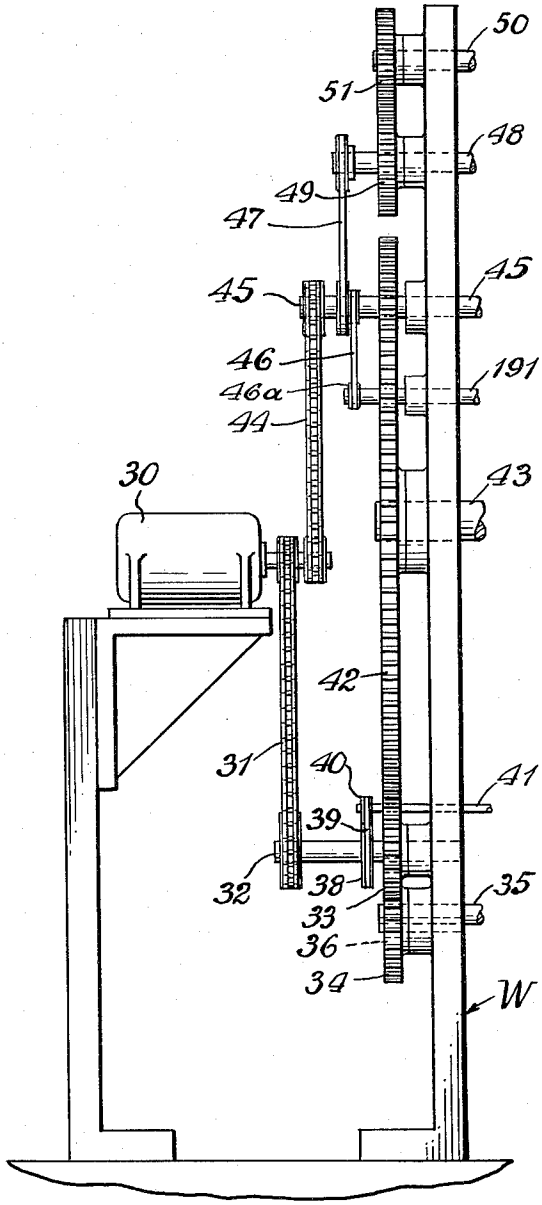


Fig. 6

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DEVICE FOR PRODUCING A CONTINUOUS TOBACCO ROD

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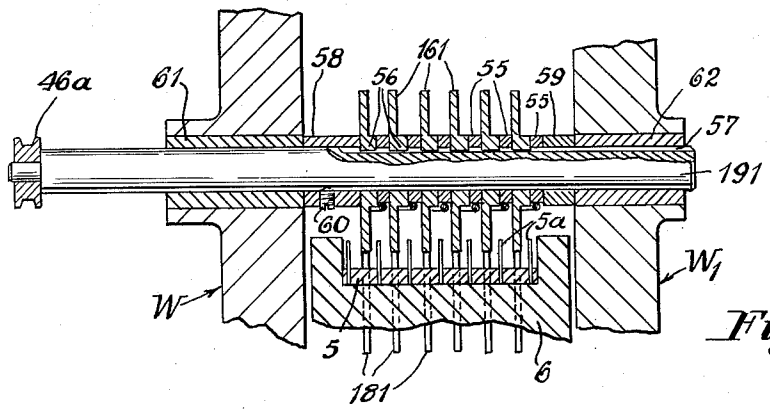


Fig. 7

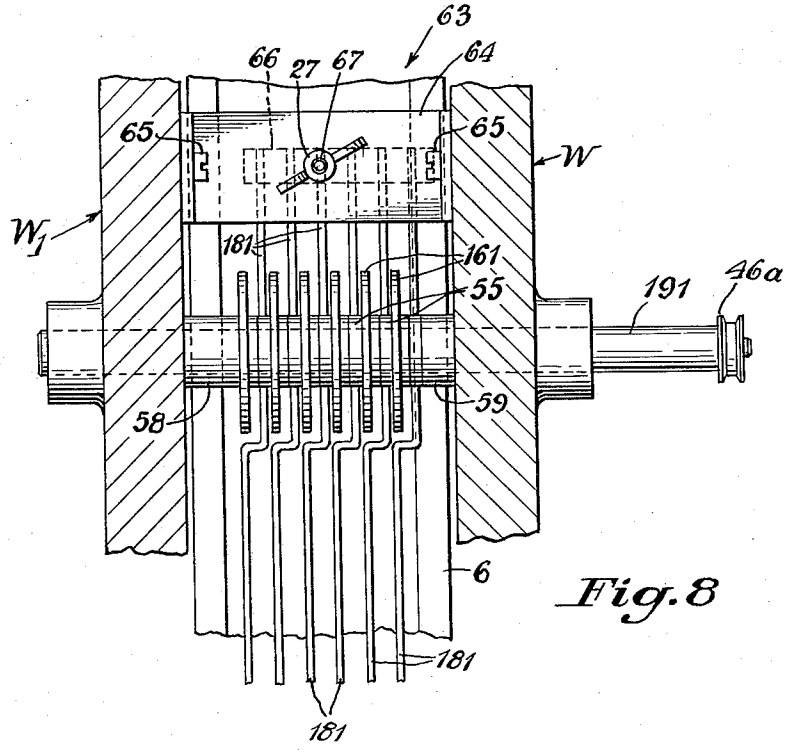


Fig. 8

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3,045,681

DEVICE FOR PRODUCING A CONTINUOUS TOBACCO ROD

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Claims priority, application Germany Feb. 3, 1959
1 Claim. (Cl. 131—109)

This invention relates to cigarette making machines and more specifically to a device for producing a continuous tobacco rod for use in such cigarette making machines.

Cigarette making machines are known in which a tobacco distributor is arranged below a rod-forming mechanism and tobacco supplied by the distributor is fed by a conveyor to the lower portion of a feed wheel rotating about a horizontal axis in a vertical plane and raises the tobacco to a higher level. This wheel is provided with a circumferential groove for receiving the tobacco and for discharging the tobacco at said higher level in a continuous stream onto a horizontally moving endless cigarette rod forming belt.

In accordance with the present invention means are provided at the periphery of the feed wheel over the region between the distributor and a picker wheel for compacting, holding down and trimming the tobacco located in a peripheral groove of the feed wheel, as well as means for deflecting and/or leading away tobacco trimmed from the surface of the tobacco stream.

The device for compressing the tobacco, which could for example be driven at the speed at which the tobacco stream is moved, consists of a roller, in some cases grooved in a peripheral direction, or of several wheels or discs arranged successively in an axial direction and in some cases with spaces between them. As the means for holding down the tobacco, there are preferably used in accordance with the invention pretensioned spring elements engaging the tobacco. According to one example the initial tension of the spring elements is made adjustable. Preferably the spring elements are pivotally arranged around the axes of the rollers or of the wheels or discs.

Further the invention relates to a construction in which the tobacco distributor is arranged above the rod-forming mechanism.

The accompanying drawing shows the features of the present invention in the form of one example, wherein:

FIG. 1 shows a diagrammatic side elevation view, partly in section, of a cigarette rod making machine according to the invention,

FIG. 2 is a fragmentary sectional view of a portion of the machine shown in FIG. 1, showing details of the tobacco compacting means,

FIG. 3 is a fragmentary section along the line III—III of FIG. 2,

FIG. 4 shows in a sectional view another mounting of the tobacco compacting means,

FIG. 5 illustrates in a side elevation view the drive for the various driven elements of the device shown in FIG. 1,

FIG. 6 is an elevational view of the drive arrangement looking in the direction of the arrow P in FIG. 5,

FIG. 7 is a fragmentary sectional view along the line VII—VII of FIG. 4, and

FIG. 8 is a fragmentary elevational and sectional view of the compacting discs looking in the direction of the arrow P_1 in FIG. 4.

FIG. 1 illustrates an arrangement for forming a continuous stream of tobacco, particularly cut tobacco, to be used in a continuous cigarette rod machine. An endless

tobacco receiving belt 1 is arranged horizontally below a feed wheel 6 which rotates in a vertical plane and is supplied at the upper portion of its circumference with tobacco by a tobacco distributor 2. The tobacco is supplied in the form of a shower and drops into a peripheral groove 6*a* of the feed wheel 6. The bottom of the groove 6*a* is provided with a spiked carding belt 5. Preferably the spikes 5*a* carried by the belt 5 are arranged in peripheral rows. Obviously other tobacco engagement means may be used in the groove 6*a* of the feed wheel 6 instead of the spikes 5*a* of the belt 5.

The tobacco engaged by the spikes 5*a* passes beneath the presser roller 15 which compacts the tobacco stream. The roller 15 is driven preferably at the speed with which the tobacco stream is moved by the wheel 6. Additional compacting wheels or discs 16 (see also FIGS. 2 and 3) extend between the rows of spikes 5*a* of the carding belt 5 and also may be driven at the same speed as the tobacco stream so that the tobacco is still further compressed, but some tobacco fibers 24 which are not sufficiently compacted by this action will still project radially outwardly beyond the tips of the spikes 5*a*. In this condition the tobacco is held by means 18, which preferably are pretensioned, until the tobacco comes into the range of a trimming means, for example a rotating cutter blade 17.

In the embodiment shown in FIGS. 2 and 3, the hold-down means 18 consists of resilient wires fastened with their bent ends 19*a* between the compacting wheels 16 which latter are freely rotatable on a shaft 19 and held in axially spaced relation thereon by means of spacer sleeves 20. The other free ends of the wires 18 bear yieldingly on the upper surface of the tobacco stream compressed by the compacting wheels 16.

Alternatively, as shown in FIG. 4, the resilient wires 181 may pass with offset portions beyond the shaft 191 to be attached to an adjustable crossbar 66 as will be described hereinafter in connection with FIG. 8. This arrangement is particularly suitable in those cases in which the compacting wheels 161 are rigidly connected to the shaft 191 and driven with the speed of the tobacco stream. The pretensioning of the resilient wires 181 by flexing the same about the sleeves 55 can be varied by rotatably adjusting the wing nut 27.

Referring to FIG. 3, for producing a certain radial movement of the compacting wheels 16 the shaft 19 thereof is attached with its ends to rectangular guide blocks 21 which are slidable in radial guides 22 in the machine frame 23 against the actions of springs. The initial pressure of the resilient wires 18 can be altered by rotatably adjusting the normally stationary shaft 19 in the guide blocks 21.

The tobacco fibers 24 projecting radially beyond the tips of the spikes 5*a* are trimming by means of rotating circular cutters 17 positioned substantially in a plane that is tangential to the circumference of the feed wheel 6. Any other suitable cutting or shearing means may also be employed. The cut tobacco drops onto an endless conveyor belt 25 and is returned to the distributor 2 in any suitable way, for example by being supported during its travel between this belt 25 and another belt 26, as shown in FIG. 1. The trimmed tobacco may, however, be supplied to any other point, for example to a collecting container. Instead of the two cooperating conveyor belts 25, 26 any other conveyor means may be used, for example carding belts or suction feed pipes.

The trimmed tobacco between the spikes 5*a* in the groove 6*a* is held in place by means of a curved guide blade 8 until it reaches a rotating beater roller 10 which picks the tobacco from the groove 6*a* and transfers it to the horizontal endless conveyor belt 1 at approximately the speed with which the belt is moved. The conveyor

belt **1** transfers the tobacco in the usual way to a rod-forming belt where it meets a cigarette paper or other wrapping strip.

FIG. 5 illustrates a positive drive arrangement for the compacting discs **161**. As indicated in the FIGS. 1 to 3, however, the discs **16** may also be arranged to be loosely rotatable on their supporting shaft. If the discs **16** are not positively driven, but are loosely rotatable on the shaft **19**, then the drive connection with the driven shaft **45** is not required and can be omitted, but the remaining portion of the drive arrangement remains unchanged.

An infinitely variable electric motor **30** drives by an endless chain **31** a shaft **32** rotatably supported in the wall W (FIG. 6) of the machine frame. The shaft **32** has attached thereto a gear **33** which meshes with an intermediate gear **34** which in turn engages a gear **36** fixedly attached to a shaft **35** rotatably supported in the wall W. The shaft **35** carries a drive roller **37** which drives the horizontal endless conveyor belt **1**. The shaft **32** has attached thereto a pulley **38** which by an endless belt **39** drives a pulley **40** mounted on a shaft **41** to which the beater roller **10** is attached. The mentioned gear **33** also drives by means of a gear **42** a shaft **43** on which the feed wheel **6** is attached and which rotates in a vertical plane.

A second chain drive **44** leads from the motor **30** to a shaft **45** on which the compacting rollers **15** are secured. In case the device is provided with driven compacting discs **161**, as in FIG. 4, then the shaft **191** of the same is driven by means of a drive belt **46** and a pulley **46***a* from the shaft **45**. If, however, loosely rotatable compacting discs **16**, as shown in FIGS. 1, 2 and 3, are employed, then this part of the drive, namely the belt **46** and the pulleys over which it is trained, is omitted. The shaft **45** drives also by a drive belt **47** a shaft **48**, and a gear **49** attached to this shaft **48** meshes with a gear **51** on a shaft **50**. The roller **52** and **53** attached to the shafts **48** and **50** respectively, drive the conveyor belts **25** and **26** respectively, with the same speed. The shafts **41**, **43**, **45**, **48**, **50** and **191** are rotatably supported in the wall W and additionally in a wall W_1 as shown in FIGS. 7 and 8.

A separate adjustable electric motor **54** of conventional construction is used for driving the rotary circular knife **17**.

According to FIG. 7 the compacting discs **161**, as in FIG. 4, are mounted between the sleeves **55** on the shaft **191** together with the wires **181**. The faces of compacting discs **161** are provided with grooves carrying inwardly projecting keys **56** which engage a longitudinal groove **57** provided on the shaft **191** on which the discs **161** are mounted. The shaft **191** is, however, freely rotatable in the spacer sleeves **55**. The sleeves **55** determine the axial spacing of the compacting discs **161** one from another and the end sleeves **58** and **59** which have different axial lengths are interchangeable in order to provide for adjustment of the entire series of discs **161** on the shaft **191**. A set screw **60** in the sleeve **58** prevents an axial displacement of the shaft **191**. The shaft **191** is mounted in bearing sleeves **61** and **62** arranged in the walls W and W_1. One of the free ends of the shaft **191** has mounted thereon a pulley **46***a* which is driven by the belt **46** as shown in FIG. 5.

FIG. 8 illustrates in greater detail than FIG. 4 the arrangement of an adjusting device **63** for the flexible wires **181**. A cross bar **64** is mounted between the walls W and W_1 of the machine frame by means of screws **65**. The adjustable cross bar **66** (see also FIG. 4) has attached to its lower surface the ends of the wires **181** and furthermore a bolt **67** is attached to the cross bar **66** which extends adjustably through a transverse bore **68** (FIG. 4) in the fixedly mounted cross bar **64**. The free end of the bolt **67** has attached thereto a wing nut **27** and between this wing nut **27** and the fixedly mounted cross bar **64** is arranged a compression spring **70**. It is obvious that upon an adjustment of the wing nut **27** the cross bar **66** with the wires **181** attached thereto is adjusted in a direction to flex the wires more or less around the sleeves **55** mounted on the shaft **191**.

What I claim is:

In a device for producing a continuous tobacco rod, a feed wheel rotating in a vertical plane and provided with a circumferential groove for receiving tobacco, a tobacco distributor arranged above said feed wheel for supplying the groove in the latter with tobacco, a belt with a plurality of rows of tobacco engaging pointed members at the bottom of said annular groove, rotatable tobacco picking means adjacent the lower portion of said feed wheel for removing the tobacco from said groove, an endless conveyor for receiving the tobacco removed by said picking means and arranged below said feed wheel, means arranged adjacent the periphery of said feed wheel and between said tobacco distributor and said picking means for compacting and holding the tobacco in said groove, and means for trimming the tobacco which after compacting of said tobacco projects from said groove, said means for compacting the tobacco in said groove comprising a plurality of circular compacting discs and a common shaft on which said discs are mounted in axially spaced relation, while said means for holding the tobacco comprise pre-stressed spring wire elements engaging the top surface of the tobacco in said groove, and means for pivotally attaching one end of said spring wire elements to said common shaft.

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