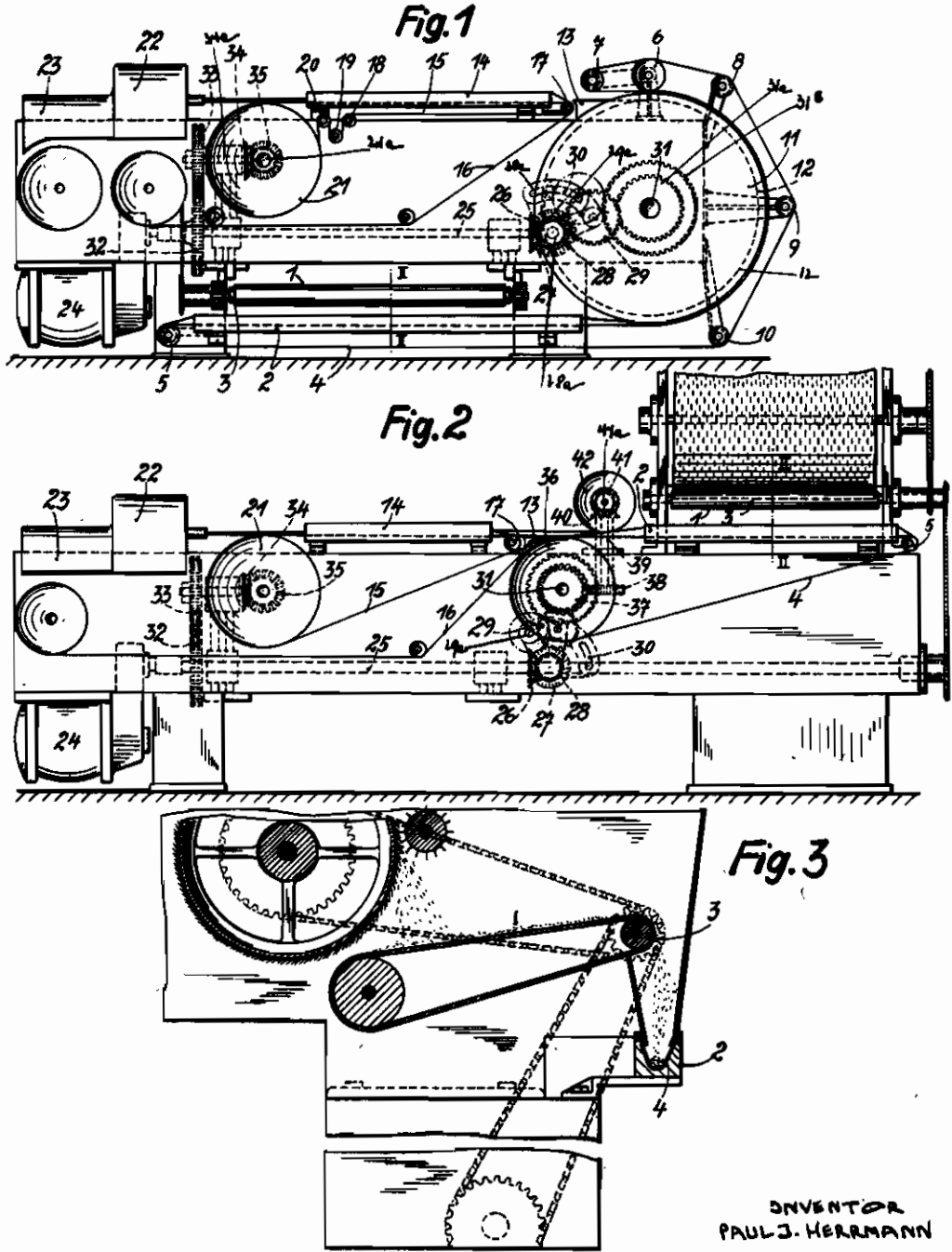


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ALIEN PROPERTY CUSTODIAN

CIGARETTE ROD MAKING MACHINE

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This invention relates to cigarette rod making machines of the wheel and belt type, and has for its object to improve the operation of the same.

It is known that the velocity of the tobacco rod in respect to the velocity of the belt conveying the tobacco rod enveloped by the paper, otherwise called the cigarette rod, as it passes through the rod and paper former, must have a certain relation, if it is desired to make cigarettes of uniform characteristics in respect to thickness and weight.

Heretofore, it has been considered essential, and it was the natural and logical manner, that the tobacco rod, as it leaves the belt, had a velocity less than that of the cigarette rod as it is being conveyed through the former.

This invention is based upon the recognition that the opposite and unexpected is true, namely, that the velocity of the tobacco rod must be greater than that of the cigarette rod. Various kinds of tobacco employed in the manufacture of cigarettes in respect to the length of the fibers, etc., moisture content, elasticity of the fibers, weight of the fibers, etc., require various requirements in regards to the ratio of the two velocities here involved to one another. In practice, the speed of the shaper belt is a given magnitude, because the cigarette length, for example, depends on this speed, since of course the cutting knife cutting into the rod to obtain proper cigarette sizes makes a very definite number of cuts in the unit of time, and therefore the length of the cigarettes can be regulated by a higher or lower speed of the cigarette rod. Accordingly the speed of conveyance of the cigarette rod belt is unchangeably fixed in each individual case, and therefore the speed of travel of the belt which feeds the tobacco rod to the cigarette rod former has to be regulated most exactly, in the first place with due regard for the speed of conveyance of the shaper belt, and secondly with due regard for the other circumstances in each instance, particularly the quality of the tobacco which is to be used in manufacture.

The invention has for its particular object to provide means for varying the velocity of rotation of the belt wheel in respect to the conveyor belt of the cigarette rod, and consists in the combination of a wheel belt cigarette rod making mechanism with the speed change gear system to enable the velocity of the belt and wheel to be variable in respect to the velocity of the cigarette rod conveyor belt, as conditions of operations require, under maintenance of greater delivery ve-

locity of the tobacco rod than the velocity of the cigarette rod conveying means.

The invention will be further described, embodiments will be shown in the drawings, and the invention will be finally set forth in the claims.

In the accompanying drawings:

Figure 1 is a front view of a known wheel belt cigarette rod making machine, combined with a variable speed changer;

Figure 2 is a front view of a different type of machine, combined also with a variable speed changer; and

Figure 3 is a detail view in section of the tobacco feed mechanism supplying the tobacco to the belt, taken on either line II—II of Figure 1, or line II—II of Figure 2.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawings, and more particularly to Figure 3, the tobacco is received on the belt 1 passing over the roller 3, from which it is discharged upon a belt 4 which is shaped into a cup or into U-shape by a former 2, at a part of the passage of the belt 4, in order to receive the tobacco. As the belt 4 meets the wheel 11, the tobacco on the belt enters the peripheral groove 12 in Figure 1, and the belt flattens and remains flat during its contact with the wheel for about one-half of its circumference. The tobacco is formed into a rod and emerges from the groove of the wheel at the bridge 13. Here it is formed with a paper 16 passing over the roller 17, by a former 14, into a cigarette rod, and this is moved by a belt 15 to the knife or cutter device 22 where the rod is cut into sizes corresponding to cigarettes, and by the device 23 conveyed further in a line of travel for further conveyance.

The belt 4 having discharged the tobacco rod to the bridge 13, is passed over the rollers 7, 8, 9 and 10 to a roller 5, and again is formed U-shaped, and receive tobacco as described.

In the form of apparatus shown in Figure 2, the belt 4 as it leaves the former 2 is acted upon by a compression wheel 42, which presses the tobacco on the belt into a rod, which then is enveloped by the paper 16 and formed by the former 14 into a cigarette rod. Such a construction is well known and is not claimed herein as new, and therefore need not be further described.

The main drive motor 24 drives the main driving shaft 25, from which, by means of a bevel gear system 26 and 27, a spur wheel 28 is driven.

The main driving shaft 25 also drives the belt 16 for conveying the cigarette rods to the cutter mechanism 22, by means of a pulley 21 over

which the belt 15 passes. Rollers 18, 19 and 20 are provided, over which the belt 15 passes. The pulley 21 is on a shaft 21a, to which a gear 35 is secured which meshes with a gear 34, on a shaft 34a, to which a pinion 33 is secured, which meshes with a pinion 32 on the shaft 25. Thereby, the speed of the main shaft is directly transmitted to the pulley 21 and belt 15. The peripheral speed of the pulley 21 can be changed by changing the diameter of the pulley 21, in a known manner, but here we are concerned only with velocity changes in different or various limits, and the adjustment of a relatively small disc.

It is of importance to vary the velocity of rotation of the wheel 11, since its operation in making the tobacco rod is dependent upon variable factors, and which requires that the velocity of the ejection of the rod be greater than the velocity of the belt 15.

Between the gear 20 driven by the main driving shaft 25 through the bevel 26, and the gears 31a and 31b of different diameters which are secured to the shaft 31 of the wheel 11, there is a gear 28 which meshes constantly with the gear 20. The gear 28 has a shaft 28a which engages a slot 30 of a scissor member or sector 30a which is pivoted to the shaft 28a of the gear 28. By the movement of the member 30a the gear 28 is moved, so as to engage either the gear 31a or the gear 31b. Thereby, the speed of the wheel 11 and the consequent formation and outward thrust of the tobacco rod may be varied as is required by the characteristics entering into the making of a proper and uniform cigarette rod.

The same variable speed structure is shown in Figure 2, and by it, in Figure 2, the peripheral velocity of the belt traction wheel 38 is controlled, and hence the velocity of the belt 4 in respect to the velocity of the belt 15 for the cigarette rod.

In Figure 2, the compression roller 42 is driven by a bevel on the shaft 41a, engaging a bevel 40, on an upright shaft 38, to which a spiral gear 39 engaging a spiral gear 37 on the shaft 31, is applied.

By the provision of the variable speed changer, actuating the wheel 11 on the one hand, and actuating the wheel 36 and the compression wheel 42, on the other hand, (the compression wheel 42 corresponding to the extended belt from roller 8 to roller 7, and to the roller 7, in Figure 1), the tobacco rod is given a velocity greater than that of the belt 15, and the velocity of the tobacco rod

as it emerges from the wheel 11 or belt 4, can be varied and instantly controlled, without changing in any manner the peripheral surface of either wheel 11 or wheel 36. Adjustment of speed by adjustments of segments in the wheels 11, 36, which change their diameters, are entirely obviated.

It has been seen that in both forms of machine, Figure 1 and Figure 2, the tobacco is first formed by a belt 4 in a former 2, and then either by a known grooved wheel 11, or by a known compression wheel 42, is shaped into a tobacco rod, to be enveloped by a paper to form a cigarette rod, which is conveyed to a cutter 22 by an apron or belt 15. As the velocity of the belt 15 and emergency thrust velocity of the tobacco rod require control, the means disposed between the drive shaft 25 and the shaft 31 enable the emergency thrust velocity of the tobacco rod to be varied and controlled in respect to the velocity of the conveying belt 15. Thereby the speed of the tobacco rod can be placed in a definite ratio to the speed of the conveyor belt 15, running in the former for making the cigarette rod, and cigarettes of uniform quality as regards density and weight may be obtained.

The invention then consists of the cooperation of a main driving shaft with a cigarette rod former conveying belt and with a tobacco rod forming belt, whereby the velocity of the tobacco rod forming belt is greater than the velocity of the cigarette rod forming belt, and with means for varying, without changing the diameter of the wheel determining the velocity of the tobacco rod belt, the velocity of the tobacco rod forming belt in respect to the cigarette rod forming belt. This being the cooperative law governing the action of the correlated parts, it is clear that the particular means shown and described as varying such velocities, as the gear 28, etc., may be substituted by means working in substantially the same way to carry out the cooperative law set forth. As the speed of conveyance of the cigarette rod has to be substantially unchangeably fixed in each individual case, as it depends upon the operation of the cutter which has a speed of cutting fixed by the length of the cigarettes, the speed of travel of the belt which feeds the tobacco rod to the cigarette former has to be regulated most exactly, in the first place with due regard to the formation of the cigarette rod, and secondly, with due regard to the quality of the tobacco used in the making of the tobacco rod.

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