Dec. 23, 1941. F. F. RUAU 2,266,808

COLLECTING MECHANISM FOR USE ON CONTINUOUS ROD TYPE CIGARETTE MAKING MACHINES

Filed Feb. 17, 1940 3 Sheets-Sheet 1

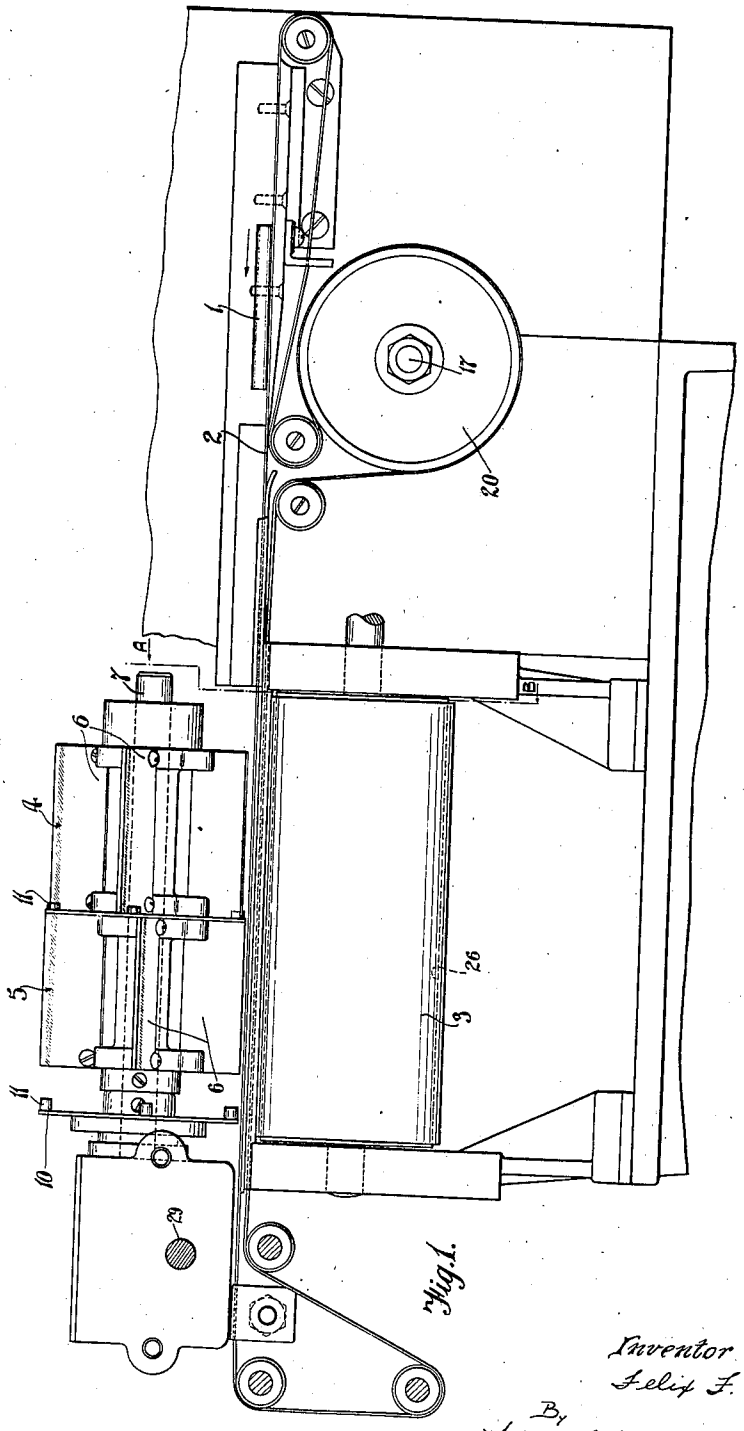


Fig. 1.

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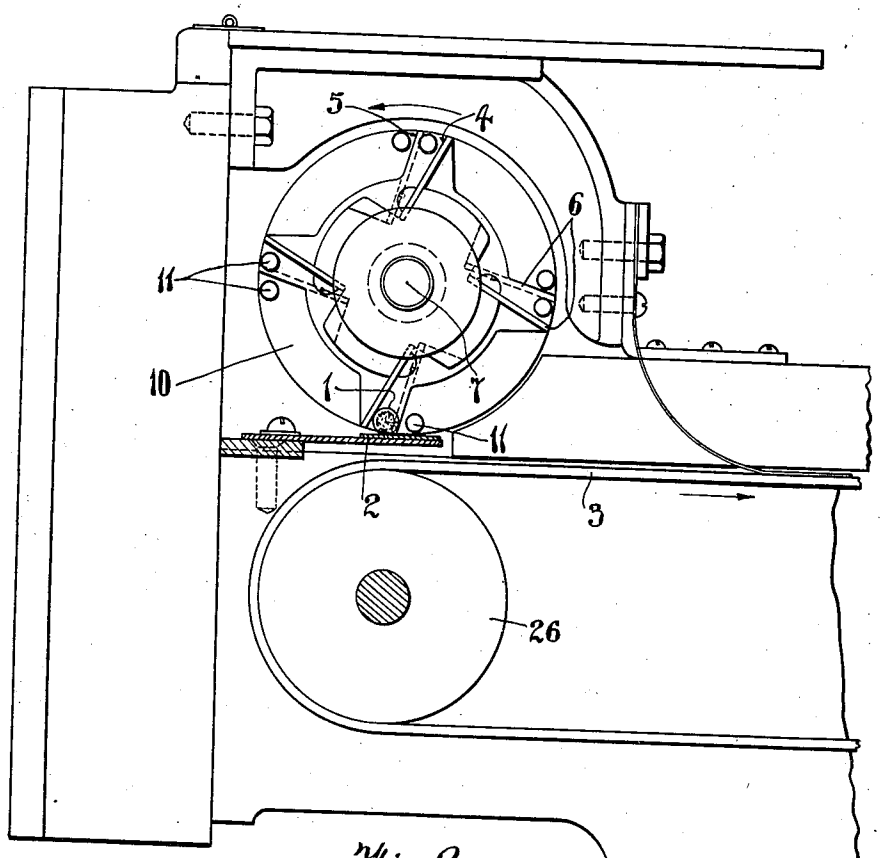


Fig. 2.

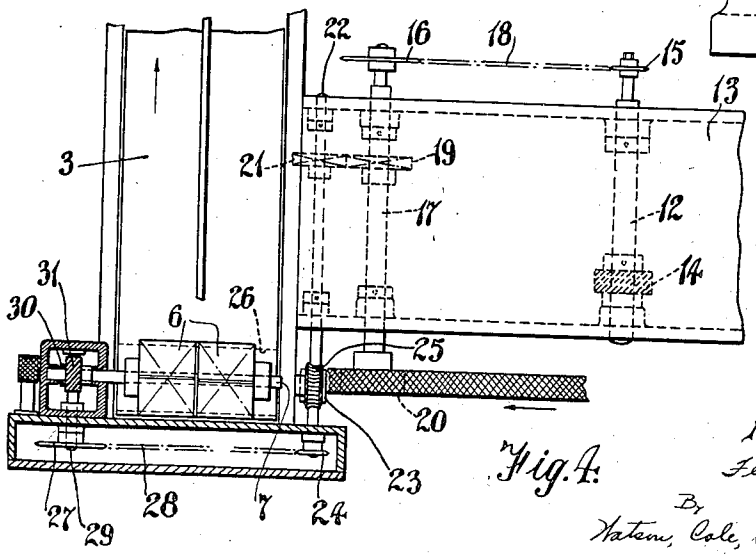


Fig. 4.

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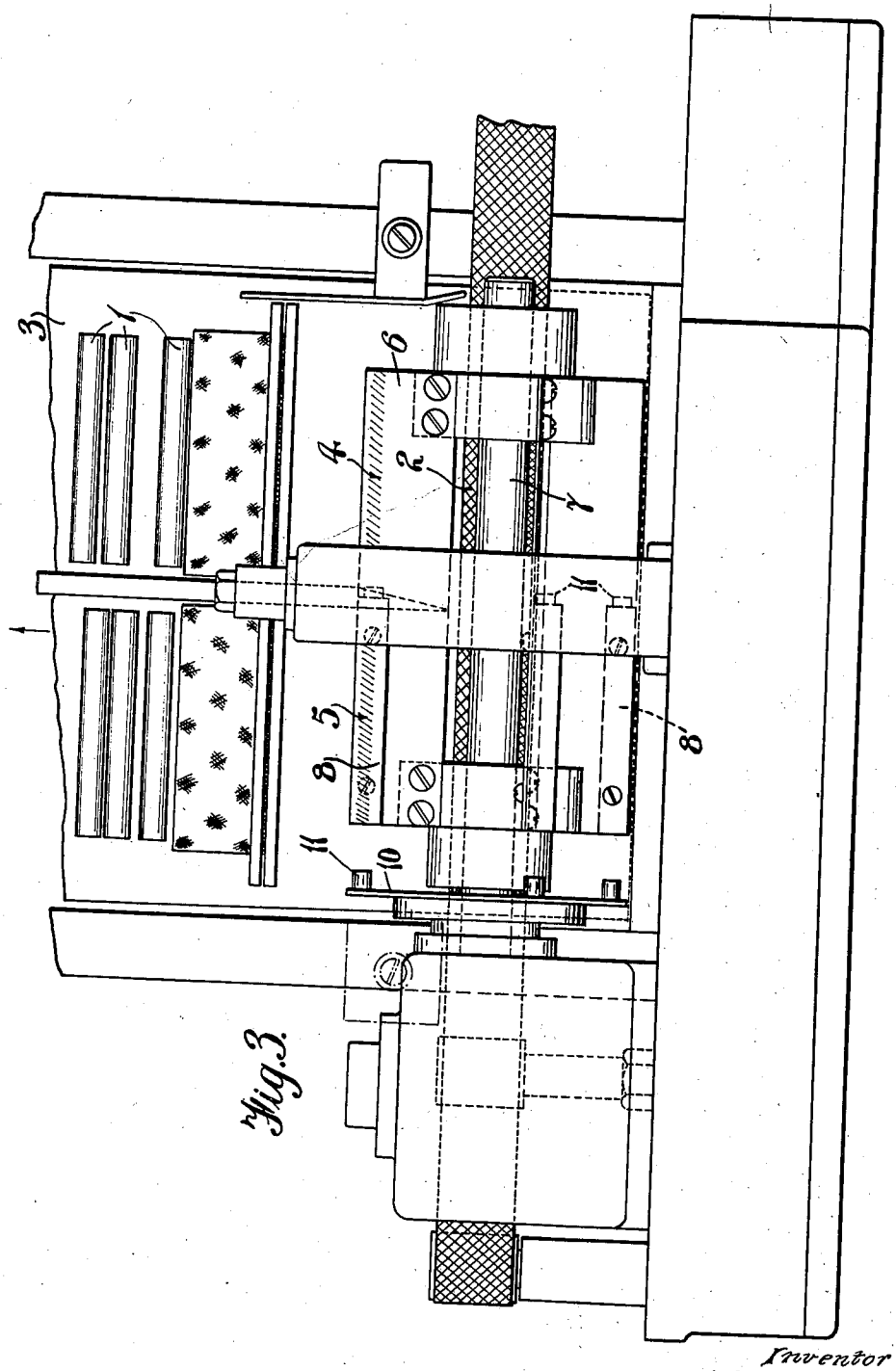


Fig. 3.

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# UNITED STATES PATENT OFFICE

2,266,808

## COLLECTING MECHANISM FOR USE ON CONTINUOUS ROD TYPE CIGARETTE MAKING MACHINES

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Application February 17, 1940, Serial No. 319,536
In Great Britain February 22, 1939

3 Claims. (Cl. 131—61)

This invention is for improvements in or relating to collecting mechanism for use on continuous rod type cigarette making machines, and refers to collecting mechanism of the type in which cigarettes comprising a length of tobacco filler contained in a tubular wrapper are moved from the cut-off mechanism of a continuous rod type cigarette making machine in axially spaced relationship by an endless band and are moved laterally from the band by a surface of a deflecting element movable above the band in an endless path (e. g. the deflecting element is rotatable about an axis disposed above the band), and in which an abutment is arranged to project into the path of the cigarettes to determine the extent of axial movement of the cigarettes away from the cut-off mechanism. Such collecting mechanism will be referred to herein as "collecting mechanism of the type described."

It is sometimes found that particles of tobacco project from the end faces of the cigarettes, and it is the object of the invention to provide means which will, during collecting of the cigarettes, improve the appearance of the end faces of the cigarettes by causing particles of tobacco which project from the end faces of the cigarettes to be moved into or towards the plane of the end faces of the cigarettes.

According to the invention there is provided collecting mechanism of the type described wherein the abutment is provided with a projection directed towards the axially moving cigarettes, said projection being so dimensioned as to engage only the tobacco at the leading end of a cigarette whereby the endwise impact of the cigarette against the projection tends to cause the ends of the tobacco filler to be moved into the tubular wrapper.

The invention will be more fully described by way of example with reference to the accompanying drawings, in which:

Figure 1 is a front elevation of a collecting mechanism constructed according to the invention, certain parts being omitted.

Figure 2 is a section of Figure 1 on the line A—B.

Figure 3 is a plan of a mechanism similar to that shown in Figure 1 but illustrating a modification.

Figure 4 is a view similar to Figure 3, drawn to a small scale, and showing the driving arrangements.

Like reference numerals refer to like parts throughout the specification and drawings.

The drawings show mechanism for collecting cigarettes in two side by side rows as is usually the case, but as will be seen later, the invention is equally applicable to mechanism delivering the cigarettes in a single row or in more than two rows.

Referring to the drawings, cigarettes 1 issuing from the cut-off mechanism of a continuous rod type cigarette making machine are received on the surface of a band 2 which moves at a linear speed greater than that of the continuous cigarette rod so that the cigarettes are arranged in axially spaced relationship on the band. The band conveys the cigarettes to a position at which they are moved laterally from the band and delivered on to the surface of a catcher band 3 moving in a direction at right angles to the direction of movement of the band 2 by which the cigarettes are moved away from the cut-off mechanism.

Referring mainly to Figure 3, the cigarettes are moved laterally in two rows, the cigarettes of each row being moved by operative surfaces 4 and 5 of a deflecting element consisting of a plate 6 fixed to a shaft 7 which is rotatable about an axis disposed above the surface of the band. The width of the band 2 is such that the cigarettes are supported by the band whilst being moved laterally until the leading end faces of the cigarettes engage with abutments referred to in detail later which determine the extent of the axial movement away from the cut-off mechanism. These conditions are made possible by co-relating the speed of movement of the cigarette engaging surfaces 4 and 5 of the deflecting element 6 with the speed of movement of the band 2 and with its width. The deflecting element 6 is movable in timed relationship with the band 2, and the width of the band is so selected that the axial movement of a cigarette by the band is continued during the lateral movement of the cigarette until or almost up to the instant when a cigarette engages an abutment. The cigarette is capable of moving relatively to the operative surfaces 4 and 5 of the deflecting element 6 whilst being moved laterally thereby due to the fact that the friction between the cigarettes and the band is greater than the friction between the cigarettes and the surface of the deflector which moves the cigarettes laterally.

In collecting mechanism as hitherto proposed and for delivering two rows of cigarettes to the catcher band, the deflecting surfaces for the rows are disposed relatively as may be seen in Figure 2, where the surface 4 for deflecting the row nearer to the cut-off mechanism is retarded with respect to the surface 5 for deflecting the other row in

order to give alternate cigarettes time to pass by the first deflector surface. The relative displacement between the surfaces may be obtained as in Figure 2 by having two separate deflecting elements 6 mounted on the shaft 7, or the two surfaces may be provided by a single plate 6 having blocks 8 fixed on to it as shown in Figure 3. In either case the operative surfaces 4 and 5 on the elements for the two rows are arranged stepwise, and the steps constitute the abutments for arresting the row or cigarettes nearer to the cut-off. The other row is arrested by an abutment which may be a disc 10 mounted for rotation with the deflecting elements.

It is sometimes found when the cigarettes impact endwise against such abutments that there is a tendency, if the ends of the cigarettes are inclined to be soft, for the end of the tubular wrapper to become slightly damaged. To avoid this difficulty as far as possible while obtaining the advantage gained by causing the cigarettes to impact endwise against an abutment, the abutments according to the present invention comprise studs or projections 11 directed towards the cigarettes being moved axially by the band 2. The studs 11 constituting the abutments are movable in timed relationship with the deflecting surfaces 4 and 5, and in both constructions shown the studs against which the leading end faces of those cigarettes which are to be delivered to the row remote from the cut-off impact, are fixed on a disc 10 mounted for rotation with the shaft 7 supporting the deflecting element or elements as the case may be. Those studs 11 which constitute the abutments for the cigarettes which are to be delivered to the row nearer the cut-off are fixed on an end face of the element 6 having the operative surfaces 5 in the construction shown in Figure 2.

In Figure 3, however, where a single deflecting element 6 is provided with blocks 8 to provide the relatively displaced surfaces 4 and 5, the studs are fixed to the ends of the blocks. These blocks are of such thickness that the distance between the surfaces 4 and 5, considered in the direction of movement of the element 6 (that is, at right angles to the direction of movement of the band 2) is substantially equal to or slightly greater than the diameter of a cigarette. The studs are cylindrical for round cigarettes and are of a length of, for example, one-eighth of an inch, and the diameter of the studs is slightly less than the diameter of the tubular wrapper for a cigarette. The studs are located upon their supports so that the studs are moved into position to be engaged by a cigarette at the appropriate instant. Due to the fact that the studs project from the surface of the supports and are smaller in diameter than the diameter of the tubular wrapper of a cigarette, only the tobacco at the end of a cigarette will be engaged by the abutment. The impacting of a cigarette against a projecting stud causes the tobacco at the leading end of the cigarette to be moved towards the leading end of the tubular wrapper of the cigarette. There will also be a tendency for the rear end of the tobacco to be improved by the momentum of the tobacco filler tending to cause compression of the tobacco and the resulting movement of the tobacco at the rear end of the cigarettes towards the rear end of the tubular wrapper.

The driving arrangements are shown in Figure 4, where 12 indicates a shaft mounted in the bed 13 of the machine and carrying a helical gear 14. This gear engages an equal gear (not shown) which is fixed to the shaft of the cut-off. A sprocket 15 on the shaft 12 drives another sprocket 16 fixed on a shaft 17 through a chain 18. The shaft 17 has a gear 19 fixed on it, and its outer end carries the tape driving drum 20. The gear 19 engages with a gear 21 on a shaft 22 which also carries a worm 23 and a sprocket 24. The worm engages with a worm wheel 25 fixed to the spindle of the roller 26 which drives the band 3 while the sprocket 24 drives another sprocket 27 by a chain 28. The spindle 29 to which the sprocket 27 is fixed has a spiral gear 30 on it which engages another spiral 31 fixed on the spindle 7 which carries the deflectors. Thus all the parts are driven at the necessary speeds.

From the foregoing it will be seen that there is a set of studs for each row of cigarettes to be delivered to the catcher band 3, and thus where only a single row is required only a single set of deflector blades such as those embodying the operative surfaces 5, Figure 1, will be required. The studs 11 would then be arranged on the disc 10 as in the devices illustrated.

It will be appreciated that if the cross-section of the cigarettes is other than substantially circular, for example, if the cross-section is oval, then the studs will not be cylindrical but will conform substantially to the cross-sectional shape of the cigarettes. In all cases, however, the cross-sectional size of the studs is slightly less than that of the cigarettes so that only the tobacco at the ends of the cigarettes is engaged by the studs.

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

1. Collecting mechanism for cigarettes issuing from the cut-off mechanism of a continuous rod cigarette making machine comprising an endless band to convey the cigarettes in axially spaced relationship, a deflecting element movable above the band in an endless path to deflect cigarettes laterally from the band, and an abutment to determine the extent of axial movement of the cigarettes away from the cut-off mechanism, said abutment being provided with a projection directed towards the axially moving cigarettes, such projection being so dimensioned as to engage only the tobacco at the leading end of a cigarette whereby the endwise impact of the cigarette against the projection tends to cause the ends of the tobacco filler of the cigarette to be moved into the tubular wrapper, said band constituting the sole means for propelling said cigarettes against said projection at the moment of impact.

2. Collecting mechanism for cigarettes issuing from the cut-off mechanism of a continuous rod cigarette making machine comprising an endless band to convey the cigarettes in axially spaced relationship, a deflecting element movable above the band in an endless path to deflect cigarettes laterally from the band, and an abutment to determine the extent of axial movement of the cigarettes away from the cut-off mechanism, said abutment being mounted for movement with the deflecting element and being provided with a projection directed towards the axially moving cigarettes, said projection being so dimensioned as to engage only the tobacco at the leading end of a cigarette whereby the endwise impact of the cigarette against the projection tends to cause the ends of the tobacco filler of the cigarette to be moved into the tubular wrapper, said band

constituting the sole means for propelling said cigarettes against said projection at the moment of impact.

3. Collecting mechanism for cigarettes issuing from the cut-off mechanism of a continuous rod cigarette making machine comprising an endless band to convey the cigarettes in axially spaced relationship, a deflecting element movable above the band in an endless path to deflect cigarettes laterally from the band, and an abutment to determine the extent of axial movement of the cigarettes away from the cut-off mechanism, said abutment being provided with a substantially cylindrical projection directed towards the axially moving cigarettes, such projection being so dimensioned as to engage only the tobacco at the leading end of a cigarette whereby the endwise impact of the cigarette against the projection tends to cause the ends of the tobacco filler of the cigarette to be moved into the tubular wrapper, said band constituting the sole means for propelling said cigarettes against said projection at the moment of impact.

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