MACHINE FOR PERFORATING CIGARETTE WRAPPERS AND THE LIKE

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Fig. 1.

Fig. 2.

Fig. 3.

INVENTOR:
Edwin Caldwell

BY
Redding

Attorneys.
MACHINE FOR PERFORATING CIGARETTE WRAPPERS AND THE LIKE.

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In a co-pending application filed by the present applicant on December 10, 1926, Serial No. 153,783, there is disclosed and claimed improvements in cigarettes, cigars or the like and in accordance with which perforations are provided in the wrappers to admit air to the smoke passing through the interior of the wrapper. The present method is concerned particularly with simple, positive and effective means for perforating the wrappers in accordance with predetermined requirements to the end that air may be admitted at the necessary instants and in the required amounts to accomplish the objects of the aforementioned invention. A further object of the invention has to do with a particular form of machine for carrying on the perforating although it will appear as the description proceeds that the improved method is not limited to the type of means employed.

For convenience in describing the improvements herein sought to be covered there has been illustrated and will be described the practice of the method in connection with the perforating of wrappers for cigarettes but the claim is not limited in this respect since the method and means may be employed to equal advantage in perforating other types of wrappers to be used in smokers' materials.

Reference is now to be had to the accompanying drawings for an understanding of one suitable machine by which the improved method may be practised for the perforating of cigarette wrappers, the drawing being somewhat diagrammatic and comprising:

Figure 1 which shows in side elevation the web of a cigarette wrapper in its course of travel through the machine.

Figure 2 which shows in plan view a suitable form of guide for the web to direct it onto the perforating drum.

Figure 3 which shows a fragment of a web punctured with holes of one suitable pattern.

It is to be understood that the perforating of wrappers to accomplish the purpose set forth in the application hereinafter identified involves many considerations if the desired results are to be obtained. The size, form and spacing of the holes must be carefully controlled in accordance with predetermined factors for particular wrappers and particular tobaccos and the particular dimensions of the finished product so that nothing may be left to chance and accuracy and certainty of operation are critical desiderata.

However, it will be clear that whether the perforating of the wrapper is carried on in accordance with the improved method by the paper maker before its delivery to the cigarette manufacturer or is practiced as a concurrent incident to the manufacture of the finished cigarette by the maker is immaterial. In the illustrated embodiment it may be assumed that the improved machine is associated directly with any known type of cigarette making machine and that the web constituting the wrapper is treated by the improved method during the course of its travel into the cigarette making machine proper. Whether or not the improved machine is an integral part of the cigarette making machine or an attachment therefor is also, of course, immaterial from the standpoint of the inventive thought.

Referring now to the preferred embodiment of a suitable type of machine for practicing the improved method it appears that a supply roll a onto which is wound the wrapper b to be treated is journaled rotatably on a shaft or axle c in a frame d. From the roll a the wrapper b is led around a guide e by means of which it is caused to change direction before passing over the periphery of what will be called the perforating drum f. The drum f is journaled on a shaft or axle f' in the frame d and is free to revolve idly. On its peripheral surface are provided a plurality of radially disposed pins or bars f of such cross sectional size and shape as will insure perforation of the wrapper with holes of predetermined size and shape. Further, the bars f are disposed in such relation with respect to one another on the surface of the drum f as will insure the provision of perforations in the wrapper at such relative points and in such numbers as may be predetermined for the cigarette to be made. The wrapper b after leaving the periphery of the drum f is caused to change direction generally and pass around another guide g which, as will appear hereinafter, may be of the same general character as the guide e herefore referred to. From the guide g the wrapper may be directed to any point as, for instance, to the first element of a cigarette making machine of any known type.

Before describing the method as a whole some consideration of the character and function of the guides e, g, should be given. A simple form of guide consists of a single piece of wire so bent as to include a horizontal arm
Having an eye \( e' \) through which may pass the shaft \( f' \) when the parts are assembled; a downwardly extending arm \( e' \) bent from the horizontal portion \( e' \); a transversely extending horizontal portion \( e' \) over which the web directly passes and by which it is guided, the bends to provide the horizontal portion \( e' \) preferably being so disposed with respect thereto as indicated at \( e' \) as to confine its lateral edges and more certainly guide it; a second vertically extending portion \( e' \) corresponding to the portion \( e' \) and in parallelism therewith; a second horizontally extending portion \( e' \) corresponding to the side portion \( e' \) and in parallelism thereto and in the last named portion at its end an eye \( e' \) corresponding to the eye \( e' \) and adapted to receive the shaft or axle \( f' \) of the drum \( f' \). When the parts are in desired relationship the guide \( e' \) will assume some such position with respect to the drum \( f' \) as is indicated diagrammatically in Figure 1. To place the paper under sufficient tension to insure quick and complete penetration of the pins \( f' \) therethrough when the paper runs onto the periphery of the roll \( f' \) some sort of tensioning device for the guide \( e' \) must be employed. A simple and convenient means comprises weights \( h, h' \) slidable on the horizontal sections \( e' \) of the guide frame, the amount of tension developed depending obviously upon the distance of these weights from the pivot points \( e' \). More or less tension may be readily created for different types of paper and different types of drums depending on circumstances. After the pins have punctured the web in the manner described the paper will leave the roll. To insure clean withdrawal of the paper from engagement with the pins without tearing, another guide whose tension is adjustable is preferably provided on the far side of the roll this guide being illustrated as at \( g \) and similar to the guide \( e' \). The guide \( g \) may be hinged on the supporting shaft \( f' \) for the roll and have slidable weights \( g' \), one of which is illustrated, which may be moved toward and away from the pivotal end of the frame \( g \) to adjust tension to which the web is subjected in the manner described heretofore. These weights \( g' \) may be threaded on the frame to afford a nice adjustment and locked by any suitable devices such as lock nuts. After the web passes around the horizontal lower guide section of the frame \( g \) it may be led in any desired direction for such further use thereof as may be proposed. For instance, it might be wound onto a drum or it might be led directly into a cigarette making machine. In the latter case it has been found desirable to present the punctured web to the tobacco in such relation that when the cigarette is formed the side of the web through which the pins \( f' \) entered will comprise the outer surface of the wrapper. The reason for this is that when the pins enter the web they might punch out a slight burr which would not leave a satisfactory exterior surface for handling the cigarette.

The view in Figure 3 indicates a suitable pattern for the openings punctured in the paper, the arrangement of pins on the drum \( f' \), of course, conforming to this pattern. As emphasized before, the number, size and form of the holes provided for each cigarette length will depend upon considerations that need to be carefully predetermined taking into account the character of the paper and the tobacco and the dimensions of the finished cigarette. The improved method, however, contemplates complete latitude in such respects but definite control in accordance with such predetermined factors. The means for practicing the method such as are illustrated clearly permit considerable latitude with parts, such as the pins and the tensioning devices which may be adjusted or replaced by other units differing in dimensions or arrangements. In its broadest aspect, the method is not limited to practice with the means illustrated so long as the desired results are gotten in substantial accordance with the recitals in the appended claim.

What I claim is:

A machine for perforating a wrapper for smokers’ materials which comprises a revolving drum, radially disposed barbs mounted on the periphery thereof in predetermined relation, guides for the wrapper to direct it onto and off of the periphery of the drum, and tension applying means associated with the guides to control the engagement and disengagement of the wrapper with the barbs.

This specification signed this 11th day of February A. D. 1927.

EDWIN CALDWELL.