

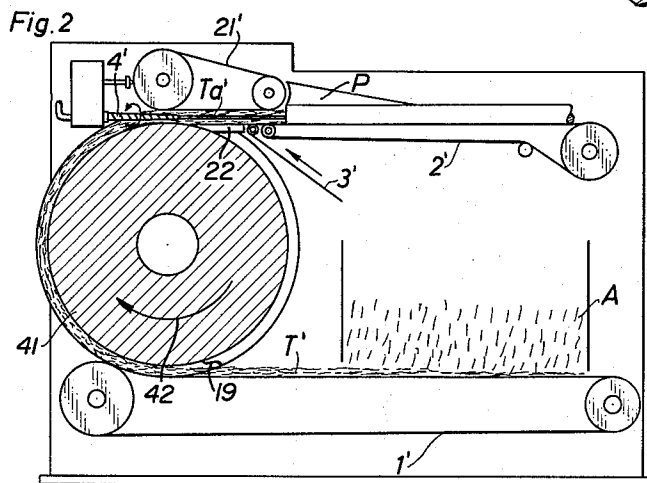
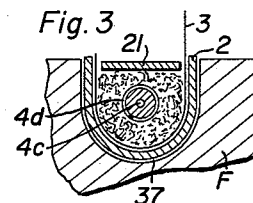
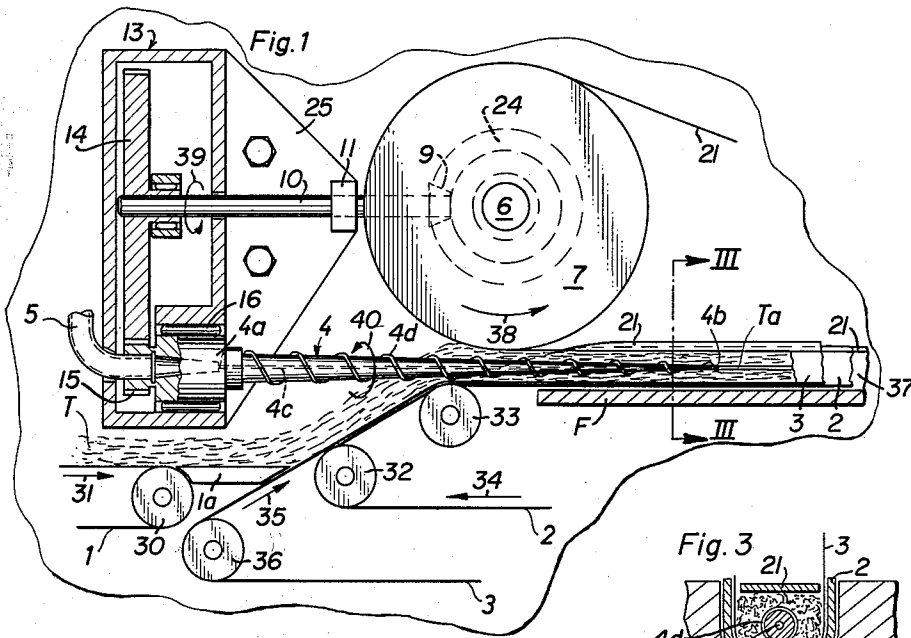
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DEVICE FOR PROVIDING CIGARETTES WITH AN AXIAL AIR DUCT

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## DEVICE FOR PROVIDING CIGARETTES WITH AN AXIAL AIR DUCT

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2 Claims. (Cl. 131--66)

The invention relates to improvements in cigarettes and like smokers' articles and is particularly concerned with an apparatus for providing cigarettes with an axially extending air duct therein.

In order to improve the properties of cigarettes it has been proposed to provide an air duct along the longitudinal axis of the cigarette which air duct in at least one tobacco zone offers a substantially lower air resistance than in the remaining cross section of the cigarette. For this purpose mandrels have, for example, been used which travel inwardly and again outwardly endwise from one or both ends of the cigarettes. This and other similar processes for forming an air duct in cigarettes are based on the manipulation of already finished cigarettes, such as is described for instance in the United States patent specification No. 2,349,551.

In the present invention the air duct is produced during the manufacture of the cigarette rod in such a manner that the wrapping of the cigarette paper around the tobacco stream is effected around a mandrel-like guide body which remains in its position and does not move lengthwise with the cigarette rod. In order to assure, however, a satisfactory air duct manufacture, the mandrel-like guide body is rotated and preferably is rifled or of helical formation on its outer surface.

The invention further provides that the mandrel-like guide body is constructed as a small tube and is supplied with a bonding medium which is ejected from the nozzle-like end of the tube and solidifies the wall of the air duct.

The invention is described below with reference to the accompanying drawing, in which:

FIG. 1 is a partial schematic view with parts shown in elevation and others in section,

FIG. 2 is a similar view on a reduced scale of a modified arrangement, and

FIG. 3 is a section on line III--III of FIG. 1 on a slightly enlarged scale.

Referring first to FIGS. 1 and 3, an endless conveyor belt 1 of which a portion only is shown, is trained over a pulley 30 and adapted to move in the direction indicated by the arrow 31. An endless forming belt 2 (also only partly shown) is trained over pulleys 32 and 33 and adapted to move in the direction indicated by the arrow 34. A bridge 1a is disposed on the level of the upper bight of the belt 1 and extends from the pulley 30 toward the pulley 32 leaving sufficient space between the bridge and said pulley 32 to permit passage of a strip of cigarette wrapping paper 3 which from a supply source (not shown) moves in the direction indicated by the arrow 35 over a roller 36 and in engagement with the forming belt 2 from the pulley 32 to the pulley 33.

A table F extends from the proximity of the pulley 33 toward the right in FIG. 1 and has in its top an elongated groove 37 along which the forming belt 2 and the strip 3 are moved, thereby tending to assume the cross-sectional shape indicated in FIG. 3.

The groove 37 is substantially covered by an endless flexible steel band 21 (shown in part only) trained over a pulley 7 which is mounted above the groove and on a shaft 6, as shown, and rotates in the direction indicated by the arrow 38. Suitable drive means (not

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shown) and provided for the several belts and bands in a well known manner.

A bevel gear 24 is mounted on the shaft 6 to rotate with the pulley 7, and said bevel gear 24 is in meshing engagement with a bevel pinion 9 secured to a shaft 10 which is journaled in a bearing 11 secured to a frame member 25. The shaft 10 extends into a housing 13 on the frame member 25, and within said housing a gear 14 is secured to said shaft 10 in meshing engagement with a pinion member 15 which is fixedly connected with the end portion 4a of a mandrel-like member 4, said end portion 4a being rotatably supported in a bearing 16. Due to the connecting elements described the shaft 10 and the mandrel-like member 4 are caused to rotate in the directions indicated by the curved arrows 39 and 40, respectively, when the pulley 7 rotates in the direction indicated by the arrow 38.

The mandrel-like member 4 extends from the end portion 4a thereof some distance into the groove 37, as shown, and it is provided on its outside with a helically arranged rib 4d. The mandrel-like member 4 is pierced by an axial bore 4c which at the end portion 4a is in communication with a pipe 5 leading to a container (not shown) for a pressurized bonding medium for a purpose to be explained below.

In operation, a stream of tobacco T of controlled volume is conveyed by the belt 1 onto the bridge 1a and the strip 3 and together with said strip 3 and the forming belt 2 into the groove 37, as indicated. The steel band 21 compacts the string of tobacco in the groove 37 around the rotating member 4. Simultaneously a bonding medium, such as a glue, is supplied through the pipe 5 into the bore 4c and said fluid emerges as a spray from the end 4b of said bore 4c to stiffen and solidify the wall of the duct Ta formed in the tobacco string by the mandrel-like member 4. Further processing of the tobacco string takes place in conventional manner.

The differences in arrangement between FIGS. 1 and 2 derive essentially from the fact that in FIG. 2 the supply conveyor 1' for the tobacco stream T' is disposed below the duct forming device and fed from a distributor means A which is also located on a low level. In the arrangement of FIG. 1 a corresponding distributor (not shown) is, of course, disposed above the conveyor belt 1 to the left of the housing 13 and, accordingly, the space requirements in a horizontal direction are less in the arrangement of FIG. 2. Reference letters in FIG. 2 which have a direct correspondence in FIG. 1 are identical, with the additional of a prime.

Adjacent the delivery end of the conveyor belt 1' and in contact with the upper bight of said belt a transfer disc 41 is rotatably mounted which has a diameter approximately equal to the distance of said conveyor belt 1' below the mandrel-like member 4'. The disc 41 is provided with a circumferential groove 19 into which the stream of tobacco T' is forced when the transfer disc 41 rotates in the direction indicated by the arrow 42. The tobacco is retained in the groove 19 in a manner well known in the art. A scraper 22 extends into the groove 19 adjacent the crest of the disc 41, as shown and for a purpose well understood in the art. Except for the distinctions thus noted, the structure and function of this device are similar to those described in connection with FIG. 1. P denotes a conventional means for completing the forming of the tobacco string and the wrapping of the cigarette paper 3' therearound. A similar means may, of course, be employed in the arrangement of FIG. 1 although not shown there.

What I claim is:

1. In a device for producing an air duct in cigarettes,

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means for forming a tobacco stream and conveying it into a cigarette rod forming mechanism, including a mandrel-like member extending axially into said tobacco stream, means for wrapping said tobacco stream around said mandrel-like member, means for supplying a cigarette paper for wrapping around said tobacco stream, and means for rotating said mandrel-like member, said mandrel-like member having a helically arranged rib on its circumference.

2. In a device for producing an air duct in cigarettes, means for forming a tobacco stream and conveying it into a cigarette rod forming mechanism, including a mandrel-like member extending axially into said tobacco stream, means for wrapping said tobacco stream around said mandrel-like member, means for supplying a cigarette paper for wrapping around said tobacco stream, said mandrel-like member being provided with a lengthwise extending bore, means at the outer end of said bore for supplying a bonding material to the bore to be dis-

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charged from the other end thereof within said tobacco stream to be applied to the wall of the air duct formed in the tobacco rod, means for rotating said mandrel-like member, and a helically arranged rib on the outer surface of said mandrel-like member.

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