Dec. 10, 1940. P. J. HERRMANN 2,224,294

TOBACCO TRANSFERRING MACHINE

Filed Nov. 20, 1937 4 Sheets-Sheet 1

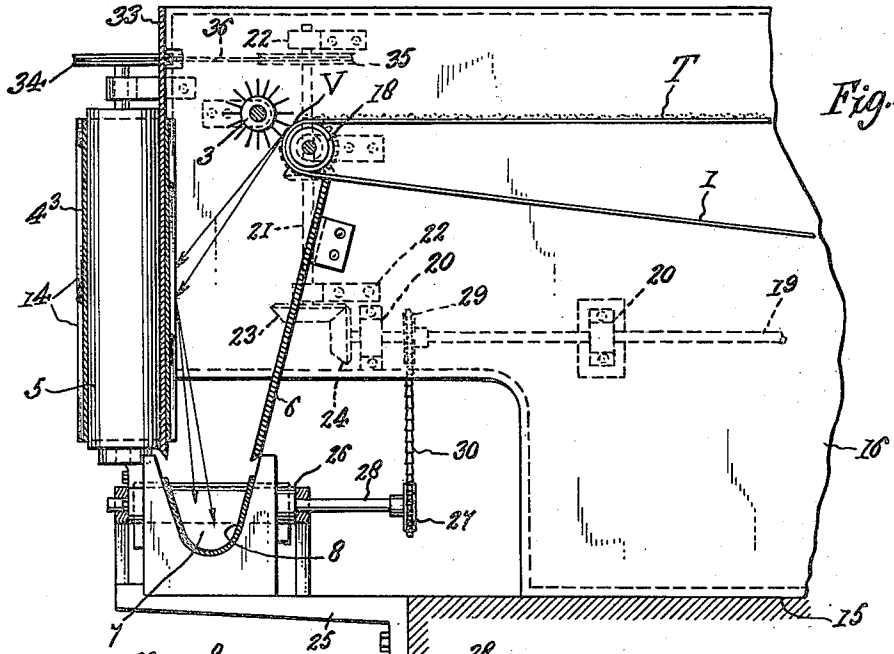


Fig. 1.

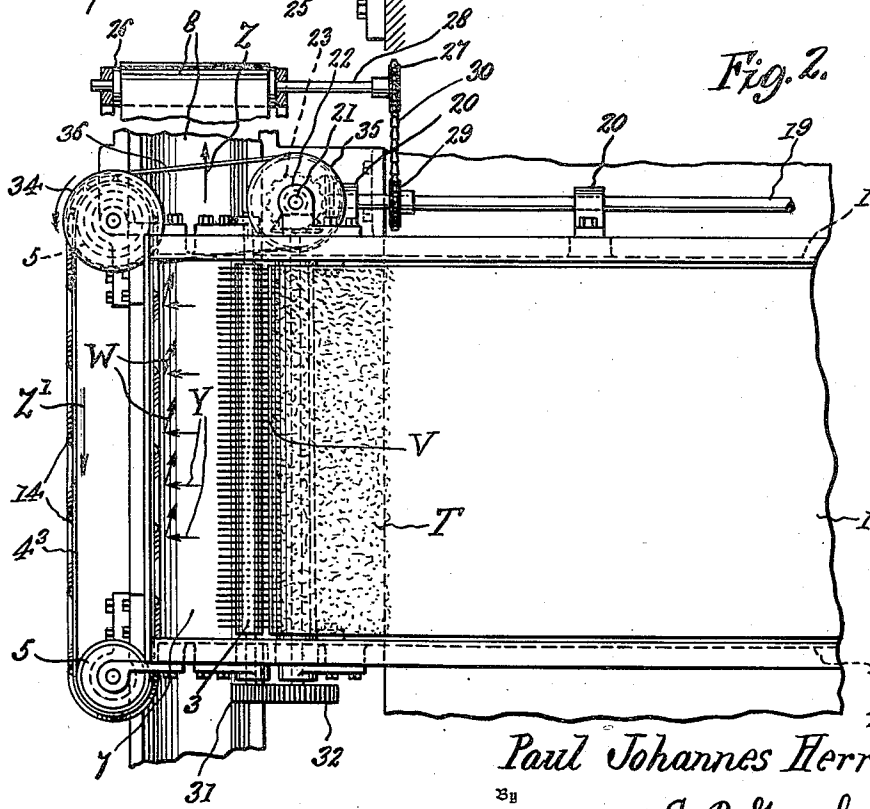


Fig. 2.

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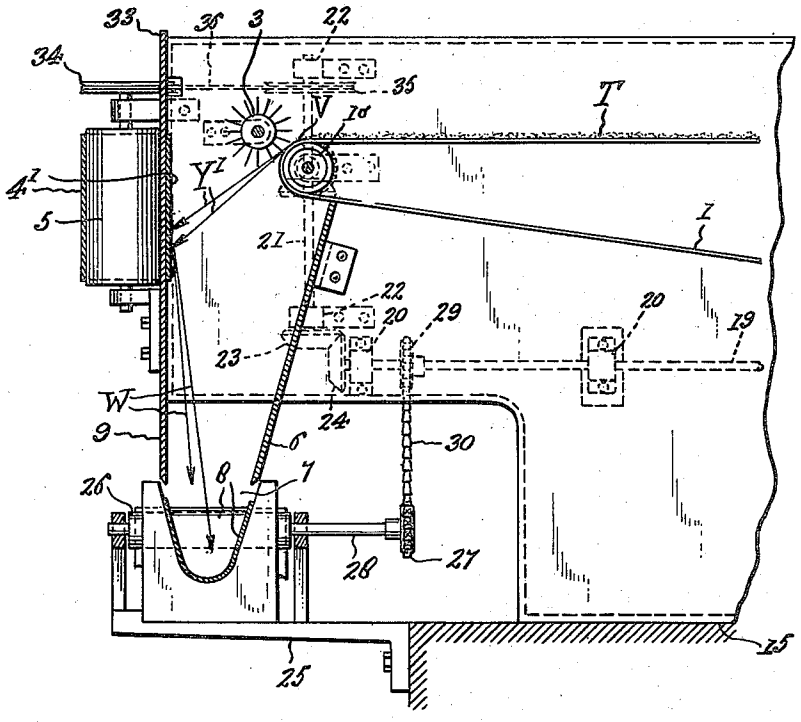
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TOBACCO TRANSFERRING MACHINE

Filed Nov. 20, 1937 4 Sheets-Sheet 2

Fig. 3.



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TOBACCO TRANSFERRING MACHINE

Filed Nov. 20, 1937 4 Sheets-Sheet 3

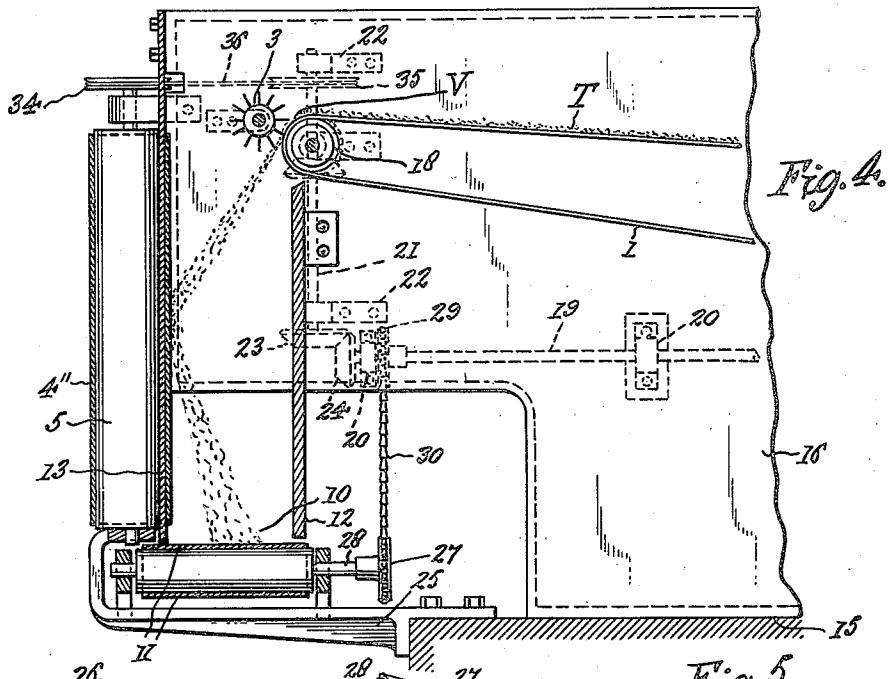


Fig. 4.

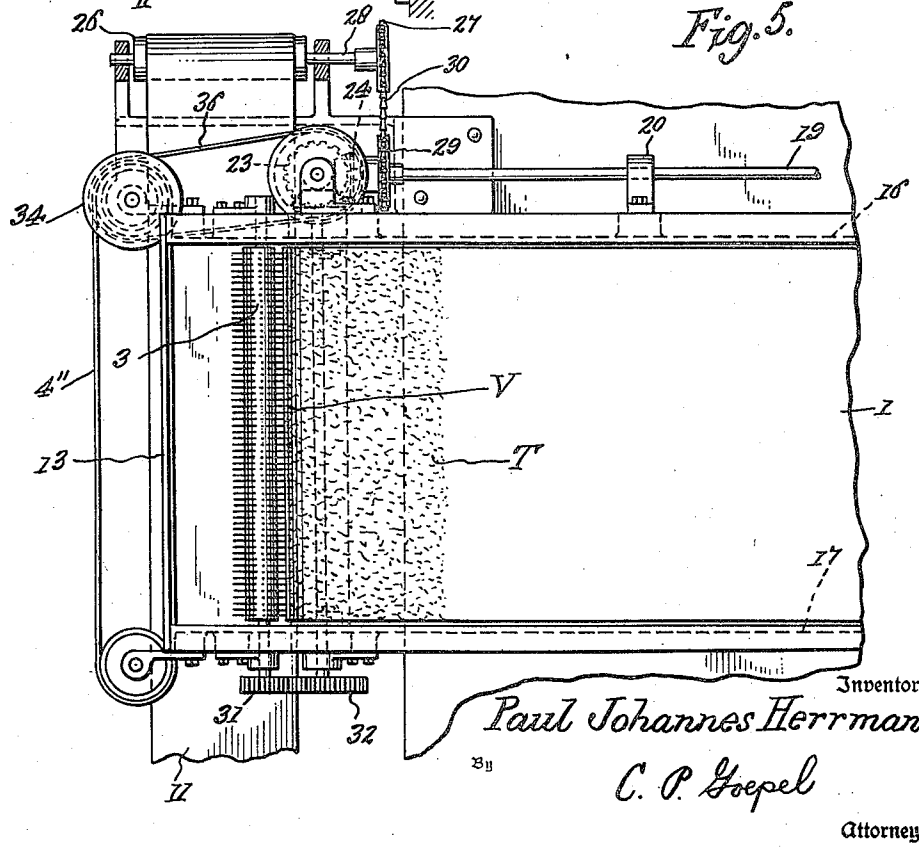


Fig. 5.

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TOBACCO TRANSFERRING MACHINE

Filed Nov. 20, 1937 4 Sheets-Sheet 4

Fig. 6.

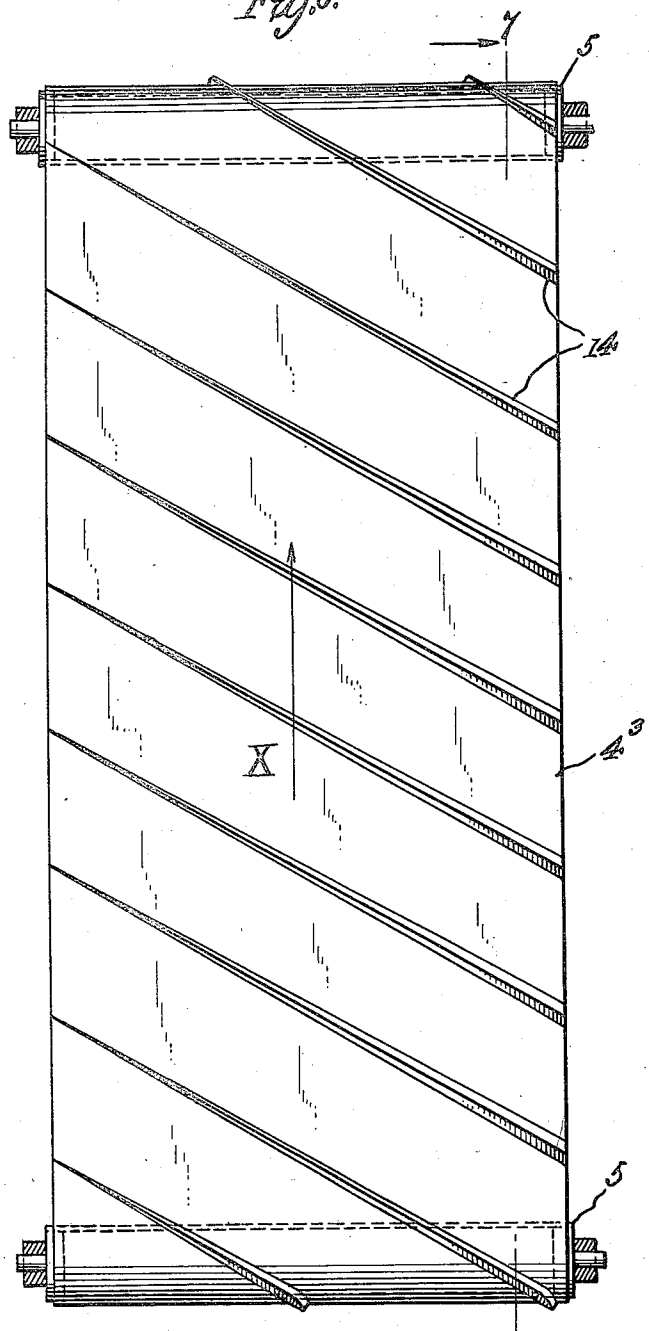
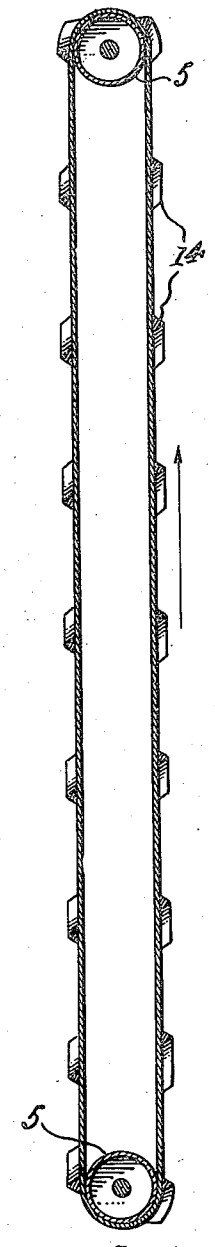


Fig. 7.



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TOBACCO TRANSFERRING MACHINE

Paul Johannes Herrmann, Dresden, Germany, assignor, by mesne assignments, to J. C. Muller N. V., Rotterdam, Netherlands

Application November 20, 1937, Serial No. 175,602
In Germany November 27, 1936

4 Claims. (Cl. 131—109)

The present invention relates to improvements in a tobacco transferring machine and is adapted for use particularly in the manufacture of cigarettes by the rod method in which a fleece or mat of tobacco is delivered into a rod forming conveyor and the cigarette paper later applied to the rod of tobacco.

The original form of device used in the rod process had the fleece of tobacco delivered upon a conveyor which consisted of three moving belts, one forming the bottom of a rod channel and the other two forming the opposite sides respectively. A frequent arrangement in this machine was to flare the side walls apart at the input end and also in many instances to twist the belts forming the side walls to an oblique angle. In that form of device the side walls of the rod channel were made gradually to converge and at the same time to right themselves to a perpendicular position. This form of channel shapes the rod of tobacco as it conducts it to the wrapping machine.

In recent forms of construction, however, there is a rod channel of U-shaped cross section into which an endless conveyor belt passes assuming the shape of the channel. Or alternatively, the rod channel is provided with stationary side walls and a flat conveyor belt forms the bottom wall thereof. Frequently the cigarette paper strip is run on the surface of the conveyor belt so that the tobacco is deposited thereon.

The modern cigarette machine has been speeded up and the conveyor belt running in the rod channel must naturally travel at a correspondingly greater speed. When this is done a well known difficulty arises in forming a rod of uniform density for the tobacco trickling down as a fleece is not taken up at once by the fast moving conveyor belt due to its inertia. The result of this slippage is that the tobacco rod formed is irregular and the tobacco tends to pile up or bunch at certain portions rather than to be distributed evenly throughout. Numerous efforts have been made to correct this defect in high speed machines.

The present invention has for an object the correction of this defect. The fleece or mat of tobacco is formed on a spreader which is in the form of a belt conveyor which is run at right angles to the direction of travel of the rod forming belt and the tobacco is delivered from the edge of the fleece forming belt or spreader. The instant invention provides means between the spreader and the rod channel which will result in an even deposit of tobacco in the channel.

A further object is to overcome the inertia of the tobacco fleece delivered from the spreader so that it will arrive at the rod channel conveyor with less resistance to movement in the direction of the wrapping machine.

A further object is to provide a substantially perpendicular moving wall between the edge of the spreader and the rod forming channel so that the tobacco fleece delivered from the spreader comes in contact with this moving wall and is thus given a velocity in the direction in which the channel conveyor moves.

A still further object consists in providing a simple mechanism operable from the moving parts of devices of the form already in use and of simple design and economical construction.

Another object consists in providing the contacting surface of the moving wall with friction devices to increase the effect of the wall on the tobacco.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views.

Figure 1 is a central vertical section through the part of a cigarette machine to which the invention is applied.

Figure 2 is a fragmentary top plan view of the device shown in Figure 1.

Figure 3 is a central vertical section, similar to Figure 1, taken through a modified form of the device.

Figure 4 is another central vertical section through a third modification of the device.

Figure 5 is a fragmentary top plan view of the device of Figure 4.

Figure 6 is a detailed showing in elevation of a modified form of the vertical belt used, and

Figure 7 is a longitudinal section taken through the device along the line 7—7 of Figure 6.

Referring particularly to Figures 1 and 2, the machine is mounted on any suitable base 15 and includes vertical end walls 16 and 17. Journalled in the end walls is a roller 18 which carries the spreader belt 1. A roller similar to 18 is journalled in the opposite end of the machine in a manner well known. The upper run of the belt 1 is disposed horizontally and receives from a suitable source a fleece or mat of tobacco T. The manner in which this fleece is formed is well known in the art and forms no part of the present invention and so is not specifically shown

or described herein. A shaft 19 coupled to a suitable driving source of any type is mounted on the outer side of the wall 16 in a pair of bearings 20. A vertically disposed shaft 21 is mounted on the same side of the wall 16 in a pair of bearings 22 and at its lower end carries a beveled gear 23 which meshes with a beveled gear 24 carried at the end of the shaft 19. The roller 18 is geared to the vertical shaft 21 by means of intermeshing beveled gears or the like so that the conveyor 1 is driven from the shaft 19.

The lower corners of the end walls 16 and 17 are cut way to provide a space extending through one side of the machine. A channel forming member 7 is disposed on a bracket 25 in said opening. At opposite ends of the channel forming member 7 a pair of rollers are mounted for rotation about a horizontal axis. One of such rollers is shown at 26 in Figures 1 and 2. A conveyor belt 8 extends over said rollers and adapts itself to the shape of the channel forming member 7 and is adapted to run in the direction of the arrow Z in Figure 2. The drive of the belt 8 is accomplished by means of a sprocket 27 secured on the shaft 28 extending through the roller 26, a sprocket 29 secured to the shaft 19 and a chain 30 interconnecting the two sprockets. An inner slanted wall 6 is secured to the opposite end walls 16 and 17 and lies between the lower run of the belt 1 and the inner upper edge of the rod forming conveyor which is composed of the member 7 and the belt 8. Likewise journalled in the end walls 16 and 17 of the machine is a beater 3 which has prongs or teeth on its surface for the purpose of seizing the fleece of tobacco as it passes over the edge V of the spreader. The beater is driven by means of a spur gear 31 which meshes with a similar gear 32 on the end of the roller 18. The beater 3 rotates clockwise in Figure 1 and by its action hurls the particles of tobacco delivered at the point V against the side of an endless belt 4^3 which is led on the inner side of the end wall 33 of the machine. As seen in Figure 2, the belt 4 is mounted over a pair of rolls 5 which are themselves vertically mounted on the machine. The roller 5 at the down side of the channel conveyor 8 has a pulley 34 secured thereto. A similar pulley 35 is secured to the vertical shaft 21 and a belt 36 drivingly connects the two pulleys. The belt 4^3 is driven in the direction of the arrow Z' in Figure 2 so that its inner run which lies inside of the end wall 33 moves in the same direction as the channel belt or conveyor 8.

In the operation of the device above described the fleece of tobacco T is delivered to the point V and the beater 3 projects the particles of tobacco along the lines Y against the moving wall formed by the inside run of the belt 4^3. The resulting action on the tobacco is to move it in the direction of the arrows W before it comes in contact with the belt 8. Thus the particles are already moving in the direction of the belt 8 and their inertia is overcome. As the particles fall onto the belt 8 they are picked up readily and in a smoothly distributed rod for delivery to the wrapping machine.

Should the texture of the tobacco change or the flow thereof vary, the speed of the belt 4^3 may be varied with respect to the conveyor 8 so that more or less initial velocity is imparted to the tobacco before it strikes the conveyor. The variation in speed may be accomplished in any of many well known ways. For instance, the relative sizes of the pulleys 34 and 35 may be selected to produce the desired ratio of speed.

Figure 3 shows a modification of the device above described in which the impact conveyor belt 4' does not extend the entire distance down to the rod forming channel. The lower end 9 of the end wall 33 and the wall 6 form a chute which guides the particles of tobacco onto the belt 8. It will be noted here that arrows Y' are at less of an angle with respect to the plane of the fleece T than in the previous form of the device. Increasing the speed of the beater 3 has this effect and it may be given such a speed so that all of the particles of tobacco will impinge upon the moving belt 4'.

In the form of the device shown in Figures 4 and 5, the rod forming channel is of a different type. The rod channel 10 is formed here by a vertical inner wall 12 extending from the roller 18 to a position just above the upper run of the conveyor 11. The outer wall 13 extends down to a position likewise adjacent the upper run of the belt 11. The inside run of the belt 4'' is backed or supported by the end wall 13 of the machine and in this form of the device the belt 4'' is shown as extending almost to the channel conveyor belt 11. The lower end of the inner run of the belt 4'' therefore forms one of the sides of the rod channel and it is moved at the same speed as the channel conveyor 11. The other details of the structure are similar to those in the forms previously described.

In place of moving the belts 4' or 4'' in a horizontal direction, they may be made to move in an oblique direction with respect to the horizontal. This may be accomplished by tilting the rollers 5 out of their vertical positions so that one end of the belt is higher than the other. Obviously the effect of this will be to increase the reaction given to particles of tobacco striking one of the runs of the belt.

In Figures 6 and 7 the impact belt applied in Figures 1 and 2 is disclosed on an enlarged scale. These figures show an impact belt 4^3 which is provided on its surface with diagonal ribs 14. These ribs, as shown in Figure 7, extend appreciably beyond the surface of the belt 4^3. The ribs 14 may be formed of the material of the belt or of rubber or similar elastic material. They result in increasing the gripping power of the belt on the particles of tobacco impinging against the belt. Since the particles of tobacco are directed against the belt and normally slide down its surface to the rod forming channel, the ribs 14 serve to delay this downward passage and so to influence the particles to a greater extent with the movement of the belt 4^3. It is obvious that the ribs 14 perform a function which may likewise be performed by numerous other designs in addition to the diagonals shown. A similar effect may be obtained by producing a series of grooves in the impact surface of the belt.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:

1. A tobacco feeding device comprising a tobacco delivery channel, a conveyor disposed in said channel, an endless belt mounted to dispose one run only of the belt over one side of the con-

veyor and being movable in the direction of the conveyor, and a spreader for delivering tobacco against said run of the belt to impart an initial velocity to the tobacco in the direction of movement of said conveyor, said belt being provided with spaced ribs on the operating surface thereof to increase the component of the velocity of the tobacco in the direction of movement of said conveyor.

2. In a tobacco feeding device for cigarette rod forming machines, a spreader for delivering a mat of tobacco, a belt guiding member having a trough therein positioned to receive tobacco from the spreader, a conveyor disposed in said trough and conforming to the shape thereof adapted to deliver tobacco to said rod forming machine, and an endless belt mounted to dispose one run only thereof over one side of the conveyor and being movable in the direction of movement of said conveyor whereby to deflect tobacco delivered against said run from the spreader, said endless belt being provided with spaced ribs on the operating surface thereof to increase the deflection of tobacco in the direction of movement of said conveyor.

3. A tobacco feeding device comprising a tobacco delivery channel, a conveyor disposed in said channel, an endless belt mounted to dispose one run only of the belt over one side of the conveyor and being movable in the direction of the conveyor, and a spreader for delivering tobacco against said run of the belt to impart an initial velocity to the tobacco in the direction of movement of said conveyor, said belt being provided with spaced ribs on the operating surface thereof to increase the component of the velocity of the tobacco in the direction of movement of said conveyor, the lower edge of said belt being spaced a substantial distance above the conveyor.

4. A tobacco feeding device comprising a tobacco delivery channel, a conveyor disposed in said channel, an endless belt mounted to dispose one run only of the belt over one side of the conveyor and being movable in the direction of the conveyor, and a spreader for delivering tobacco against said run of the belt to impart an initial velocity to the tobacco in the direction of movement of said conveyor, said belt being provided with spaced ribs on the operating surface thereof to increase the component of the velocity of the tobacco in the direction of movement of said conveyor, said belt extending down substantially to the conveyor to form one side of the delivery channel and projecting over a portion of the surface of said conveyor.

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