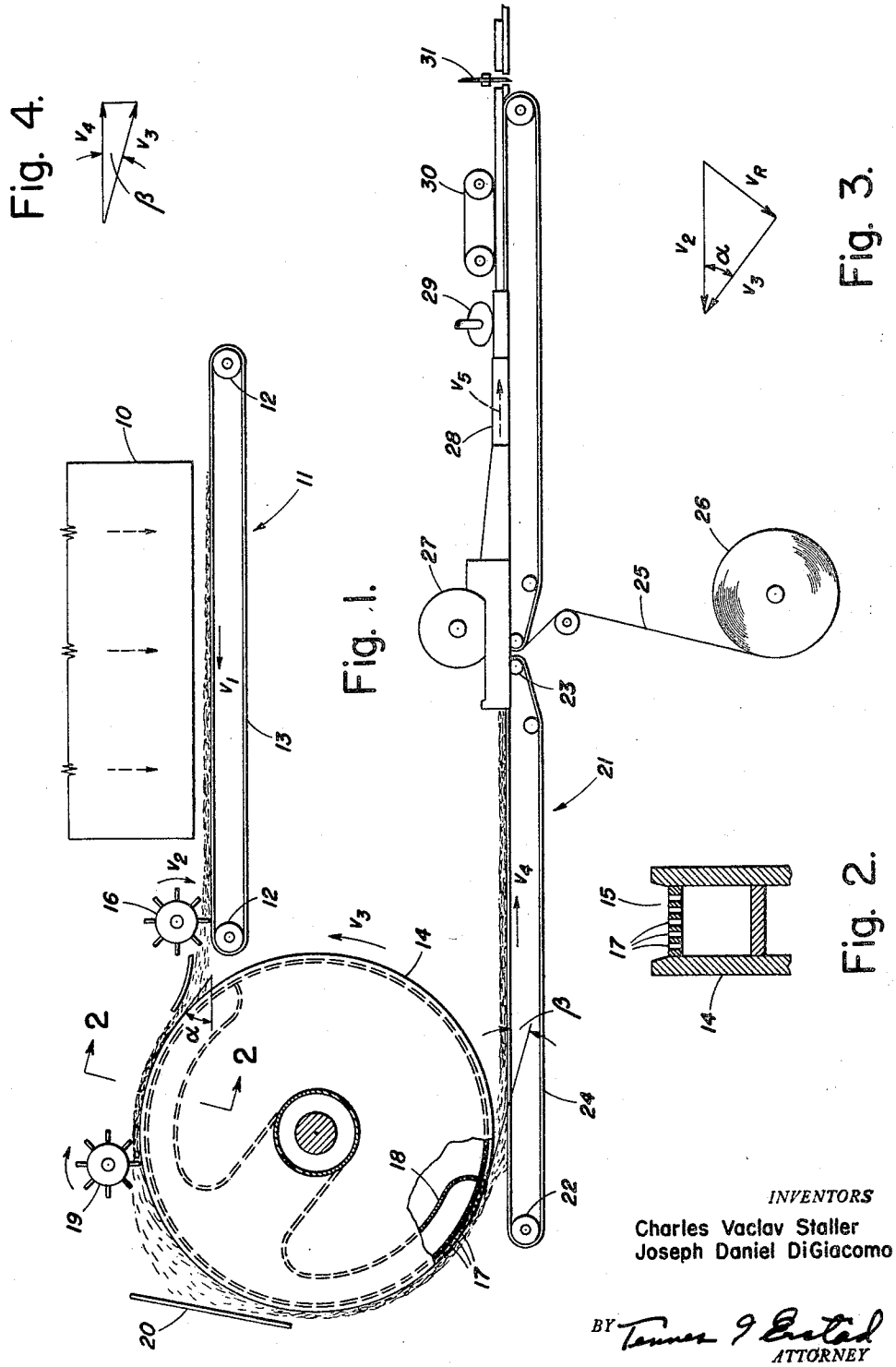
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CIGARETTE MAKING MACHINE

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CIGARETTE MAKING MACHINE

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This invention relates to the making of cigarettes and is primarily concerned with an apparatus and method for making a cigarette rod.

Experience has shown that running a cigarette machine belt for collecting showered tobacco at very high speeds results in non-uniform distribution of showered shredded tobacco on this belt. This in turn results in a cigarette rod which is not of uniform density and compaction.

An object of the present invention is to collect showered shredded tobacco at a slow linear speed and deposit it at a higher linear speed in the form of individual strands onto a second conveyor to allow for a more selective deposition than is presently attained.

Another object of the invention is to collect showered shredded tobacco on a conveyor running at a linear speed which will not disrupt the uniformity of the shreds and then transferring said shreds onto another conveyor running at a higher linear speed thus enabling the cigarette making machine to be operated at a higher speed than was possible heretofore while still permitting the use of conventional cigarette making machine components.

Other objects and features of the invention will appear as the description of the particular embodiment selected to illustrate the invention progresses. In the accompanying drawings which form a part of this specification, like characters of reference have been applied to corresponding parts throughout the several views which make up the drawings.

FIG. 1 is a schematic view including an elevation of apparatus for making uniform cigarette rods.

FIG. 2 is a sectional view taken on the line 2—2 of FIG. 1.

FIG. 3 is a velocity diagram pertaining to the movement of certain components shown in FIG. 1, and

FIG. 4 is another velocity diagram.

In my invention, a suitable continuous source of supply of metered tobacco is employed to deliver a continuous shower of shredded tobacco. This showered tobacco falls through a vertically disposed duct **10** onto a conveyor **11** including a pair of spaced rollers **12** and a belt **13** trained on the rollers. The belt **13** runs in the direction of the arrow at a linear speed v_1 which will not disrupt the uniformity of the collected shreds. A conveyor in the form of a rotating dum **14** is positioned adjacent the conveyor **11**. The drum **14** has a groove **15** in its periphery. An element or rotating picker wheel **16** is disposed above the belt **13** of the conveyor **11**. The picker wheel **16** rotates in the direction of the arrow and has a peripheral linear speed v_2. The peripheral linear speed v_2 of picker wheel **16** is greater than the linear speed v_1 of belt **13**. The picker wheel **16** removes the shreds of tobacco from belt **13** and showers individual strands of tobacco onto the drum **14**.

Suitable means are provided for holding the tobacco on the drum **14**. In this embodiment the drum **14** has peripheral perforations **17** therein and suction means in the drum draws through the perforations to hold the tobacco on the drum. A shoe **18** creates suction through the perforations **17** for the length of the shoe so that tobacco will be projected off the drum **14** when it passes the shoe. The drum **14** has a peripheral linear speed v_3 which is greater than the linear speed v_1 of the belt **13**

and less than the peripheral speed v_2 of the picker wheel **16**. The tangential linear speed v_2 of the picker wheel **16** must be greater than the linear speed v_1 of the belt **13** but v_2 and the peripheral linear speed v_3 of the drum **14** may be equal. A rotating redistributor wheel **19** showers the shredded tobacco on the drum **14** in a more uniform manner than it was when received on the drum. A guide **20** deflects the tobacco into the drum **14**.

A conveyor **21** includes a pair of spaced rollers **22** and **23** and a belt **24** is trained on the rollers. When the shredded tobacco on the drum **14** passes the shoe **18**, it is projected onto the belt **24** of the conveyor **21**. Cigarette paper **25** is unrolled from a roll **26**. The shredded tobacco on the belt **24** moves under a compressor roller **27** and then through a folder **28** which folds the cigarette paper around the cigarette rod. The cigarette paper and cigarette rod move through a paster **29** and then through an ironer **30** to form a multiple cigarette length which is then severed to form finished cigarettes by means of knife **31**.

If v_5 is the linear speed of the cigarette rod in the rod forming mechanism and v_4 is the linear speed of the belt **24**, v_4 should be greater than v_5. For best results $v_4=1.2$ v_5. $v_3=v_4/\cos$ beta where beta is the angle between a tangent to the drum **14** and the belt **23**. See FIG. 4. v_4 may be equal to v_3. $v_2=v_3/\cos$ alpha where alpha is the angle between a tangent to the drum **14** and the upper run of the belt **13**. See FIG. 3. If alpha=15 degrees then $v_2=1.03$ v_3. v_R is the linear speed of a tobacco shred relative to the drum **14**. An important advantage of the invention is that the high speed of the tobacco as it leaves the picker wheel **16** impacts and compacts the tobacco against the drum **14**. Another important advantage of the invention is that the high speed of the tobacco as it leaves the drum **14** impacts and compacts it on the belt **24**. In the practice of the invention v_5 is first decided upon and then v_4, v_3 and v_2 are calculated in the order named.

A drum could be used instead of the belt conveyor **11** and instead of using the drum **14** a conveyor having a belt trained on rollers could be substituted.

The peripheral linear speed v_2 of the picker wheel **16** being greater than the linear speed v_1 of the belt **13** effects these results: Shredded tobacco is deposited onto the drum **14** in individual strands therefore allowing for a more selective deposition than if the shredded tobacco were fed in a solid stream as at present. The picker wheel **16** between the belt **13** and the drum **14** will allow this belt to be run at speeds which are desirable for tobacco stream uniformity.

This invention permits tobacco shreds to be collected on the conveyor belt **13** at a slow linear speed and allows these shreds to be directed and picked on to a drum running at a very high linear speed enabling the cigarette making machine to run at a higher speed than machines presently in use and still permits the use of conventional cigarette making machine components.

The invention hereinabove described may therefore be varied in construction within the scope of the claims for the particular device selected to illustrate the invention is but one of many possible embodiments of the same. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. The method of forming a cigarette rod comprising the steps of showering shredded tobacco to form a first stream, moving the first stream in a first path at one linear speed to separate the shreds, removing the tobacco from one end of the first stream at a linear speed greater than the linear speed of the first stream to form a second stream of uniformly disposed shreds, moving the second

stream in a second path at a linear speed greater than the linear speed of the first stream and less than the linear speed of removal, and forming the second stream into a cigarette rod.

2. Apparatus for making cigarette rods comprising a first conveyor including a pair of spaced rollers and a belt trained on the rollers with the belt running at one linear speed, means for showering shredded tobacco on the belt of the first conveyor, a rotating drum positioned adjacent the belt of the first conveyor, a rotating picker wheel positioned adjacent the belt of the first conveyor running at a peripheral linear speed greater than the belt of the first conveyor for moving the shredded tobacco off the belt of the first conveyor onto the drum, means for holding the shredded tobacco on the drum, a second conveyor receiving the shredded tobacco from the drum, and means receiving the tobacco from the second conveyor and forming it into a cigarette rod.

3. Apparatus for making cigarette rods comprising a first conveyor including a pair of spaced rollers and a belt trained on the rollers with the belt running at one linear speed, means for showering shredded tobacco on the belt of the first conveyor, a rotating drum positioned adjacent the belt of the first conveyor and running at a peripheral linear speed greater than that of the belt, a rotating picker wheel positioned adjacent the belt of the first conveyor running at a peripheral linear speed greater than the belt of the first conveyor and greater than the peripheral linear speed of the drum for moving the shredded tobacco off the belt of the first conveyor onto the drum, means for holding the shredded tobacco on the drum, a second conveyor receiving the shredded tobacco from the drum, and means receiving the tobacco from the second conveyor and forming it into a cigarette rod.

4. Apparatus for making cigarette rods comprising a first conveyor including a pair of spaced rollers and a belt trained on the rollers with the belt running at one linear speed, means for showering shredded tobacco on

the belt of the first conveyor, a rotating drum positioned adjacent the belt of the first conveyor and running at a peripheral linear speed greater than that of the belt, a rotating picker wheel positioned on the belt of the first conveyor and running at a peripheral linear speed greater than the belt of the first conveyor for moving the shredded tobacco off the belt of the first conveyor onto the drum, means for holding the shredded tobacco on the drum, a second conveyor including a plurality of rollers and a belt trained on the rollers with the belt running at a linear speed similar to the peripheral linear speed of the drum and receiving the shredded tobacco from the drum, and means receiving the tobacco from the belt of the second conveyor and forming it into a cigarette rod.

5. An apparatus for making cigarette rods comprising, showering means, a relatively slow moving first conveyor to collect a level stream from said showering means, a second conveyor relatively faster than said first conveyor and positioned adjacent a discharge end of said first conveyor, and a rotating picker wheel having a peripheral velocity greater than that of said second conveyor, said picker wheel being positioned at said end of said first conveyor to propel tobacco shreds from said first conveyor to said second conveyor, and means for receiving tobacco from the second conveyor to form it into a cigarette rod.

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