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CIGARETTE TURN AROUND DEVICE

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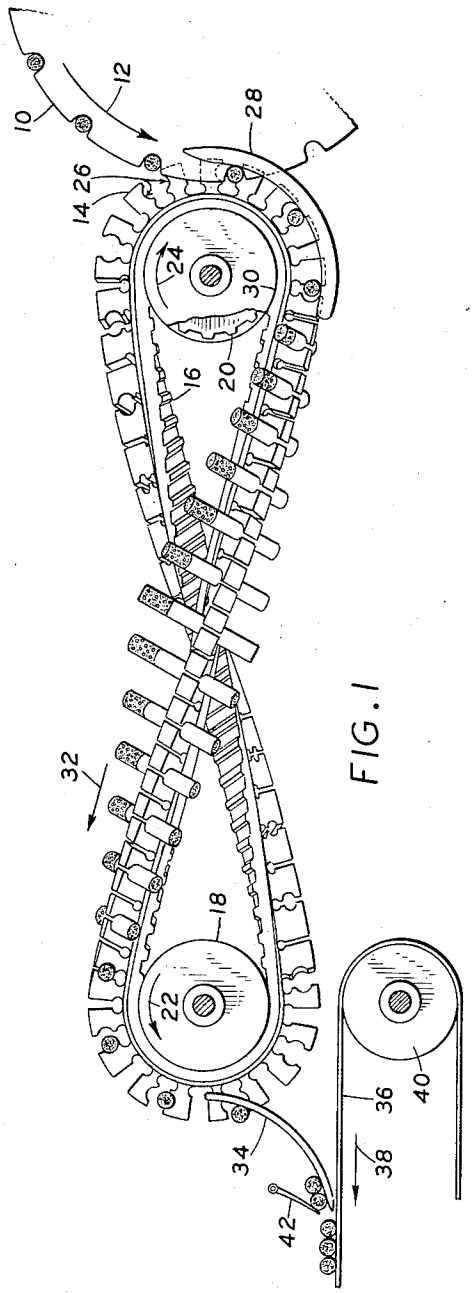

FIG. 1

INVENTOR
JESSE R. PINKHAM

BY
James J. Erstad
ATTORNEY

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CIGARETTE TURN AROUND DEVICE

Jesse R. Pinkham, Raleigh, N.C., assignor to American Machine & Foundry Company, a corporation of New Jersey

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The invention relates to an apparatus and method for turning tipped cigarettes end for end.

Mouthpiece cigarettes are presently made in cigarette making machines which discharge them side by side in two rows, onto a collector belt. The tipped ends of the laterally arranged cigarettes in one row face the tipped ends of the laterally arranged cigarettes in the adjacent row. For packaging purposes, it is desirable to have the tip ends of both rows facing in the same direction. It is therefore necessary to turn the cigarettes of one row end over end so that they will face in the same direction as the cigarettes in the adjoining row.

Various mechanical devices have heretofore been developed for turning cigarettes end for end in this manner. Some of these devices have been costly to produce, operate or maintain, or have handled the cigarettes in a manner which has damaged the cigarettes.

An object of this invention is to provide a simple cigarette turning device that will turn tipped cigarettes end for end without leaving any undesirable indentations on the cigarettes.

A further object of this invention is to provide a simple cigarette turning device having a minimum number of parts and with no stops for arresting cigarettes by their ends, that is so constructed that it may be made as an attachment suitable for use with existing cigarette making machines.

A further object of this invention is to provide a cigarette turning device comprised of a single belt to effect the turning of a row of tipped cigarettes 180°, to turn the cigarettes in the row end for end wherein the cigarettes may be conveyed to a different elevation.

A further object is to provide a turning device wherein the cigarettes can be turned from either row in a slow moving turn around timing belt and are discharged after being turned end for end onto a laterally traveling belt either in a separate row or combined with the row that did not have to be turned end for end.

A further object of the invention is that it does not require a wide catcher band or auxiliary device and thus is not effected by varying speed of production.

Another object of the invention is a turning device which can operate continuously and can automatically dispose of most of the damaged cigarettes.

Other objects and features of the invention will appear as the description of the particular physical 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.

FIGURE 1 is a side elevation of my improved cigarette turn around apparatus.

My improved cigarette turn around apparatus may be used with any conventional cigarette making machine. The apparatus I have employed to illustrate the invention may be briefly described as follows:

Cigarettes to be turned end for end are discharged from any device for presenting cigarettes in timed relationship with the timing belts or from the transfer drum **10** of the filter and tipping unit of a cigarette making machine. The transfer drum **10** rotates in the direction shown by arrow **12**. The cigarettes so discharged are received by fingers **14** which are attached to timing belt

16, such as shown in Patent No. 2,507,852 issued to Richard Y. Case. The timing belt **16** is made to run around sprockets **18** and **20** which rotate as shown by arrows **22** and **24**.

To the top face of the timing belt **16** are molded or affixed the fingers **14** with nesting cavities **26** on the complementary faces of each pair, so designed to hold a cigarette snugly. These fingers **14** are of rubber or neoprene and their cavities **26** are sized, of a diameter, slightly smaller than the cigarette that will not bruise the cigarette, yet will not drop the cigarette when it is in a vertical position. The fingers are flexible (FIGURE 1). As the belt **16** progresses over sprocket **20** the fingers **14** open and straddle the oncoming cigarette from the transfer drum **10**. A suitable guide **28** is provided for confining said cigarettes until the cigarette is nested within the cavities **26**. When the belt **16** hits the tangent point **30** and leaves sprocket **20**, the fingers grip the cigarette. The belt is twisted from sprocket **20** to sprocket **18** and the cigarette is presented to the upperside of sprocket **18** in a horizontal position.

The cigarettes are confined between the fingers **14** as they travel on the timing or gripper belt **16**. When they have traveled 180° on the belt **16** in the direction shown by arrow **32**, the fingers again open up as the belt goes about sprocket **18** and the cigarettes are released onto a curved chute or ramp, **34**, to the stacker belt **36** below. The stacker belt **36** travels as shown by arrow **38** over pulley **40**. A flexible flap **42** retards the movement of the turned cigarettes to prevent damage to the cigarettes while rolling down ramp **34**.

It will be noted that sprocket **18**, the stacker belt **36** and the ramp **34** can be located at a different elevation to that of sprocket **20** so that turned cigarettes can be conveyed to a different elevation from the elevation they were picked up. The timing belt **16** can also be used as an elevator for a row of cigarettes not to be turned.

The cigarettes are grasped slightly off center so that its rotation automatically displaces the cigarette endwise with respect to the belt **36** and thus gives a spacing on the stacker belt **36** between the rows of turned and unturned cigarettes.

It will be apparent from the foregoing description that I have provided an improved turnaround device which is capable of operating at a predetermined timed speed because of the use of the timing belt **16** which is designed to prevent any slippage on pulleys **18** and **20**. This has the advantage that the timing belt **16** and the transfer drum **10** can be keyed so that they can travel at a much higher rate of speed than was heretofore possible.

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. In a turn around device for turning tipped cigarettes end for end, a conveying means to deliver laterally cigarettes having their mouthpieces facing in one direction, a twistable endless timing belt of yieldable material, twisted in a figure 8 configuration, having opposed gripper fingers to open to receive said cigarettes as the timing belt rotates about a radius and to close and grip said cigarettes as the belt tangentially leaves the radius, and motive means for rotating said belt engaging therewith, said means being operable in timed relationship with said conveying means.

2. In a cigarette making machine a turn around device comprising a transfer drum having indentations to carry cigarettes in each of said indentations, a timing belt having radially extending grippers positioned to laterally

receive cigarettes from said drum, a sprocket over which said timing belt travels to cause said grippers to open and receive said cigarettes off center, a second sprocket over which said belt rotates after twisting to cause said grippers to open and release said cigarettes with their tips facing in another direction, a chute adjacent said second sprocket to receive said turned cigarettes and a stacker belt located beneath said chute to receive said turned cigarettes in lateral arrangement in a row offset to the transfer drum.

3. In a cigarette machine, a turn about apparatus for turning cigarettes end for end comprising, a rotating transfer drum to carry a source of supply of cigarettes laterally, a single timing belt traveling at the same circumferential speed as said drum, rubber like fingers extending perpendicularly from the outside surface of said timing belt, the complementary faces of each pair of fingers so designed to hold cigarettes snugly, a sprocket located adjacent to said transfer drum over which said belt travels, causing said fingers to open and straddle the oncoming cigarettes, a guide located on the periphery of said sprocket to guide the cigarettes while said belt progresses around said sprocket and until said fingers hold the cigarettes, a second sprocket located at a different elevation than said first sprocket, said belt being arranged to travel over said sprockets with a 180° twist therebetween, a ramp located adjacent said second sprocket to receive turned cigarettes, a flexible flap to control the movement of said turned cigarettes on said ramp and a catcher belt to laterally receive said turned cigarettes.

4. In a cigarette machine, a gripper belt turn around unit for turning cigarettes end for end comprising a cigarette conveying means, a timing belt twisted 180° having perpendicularly extending fingers, a sprocket over which said timing belt travels causing said fingers to open and straddle the oncoming cigarettes, a second sprocket over which the belt travels after rotating said cigarettes 180°, causing said fingers to open again to release the turned cigarettes and a second conveying means to receive said turned cigarettes.

5. In a cigarette making machine the method of turning cigarettes comprising rotating a timing belt having perpendicularly extending fingers around a circle so that the fingers open radially to laterally receive cigarettes, progressing the belt onto a straight run to cause the fingers to close up in parallel arrangement and hold cigarettes therein, twisting said timing belt 180° to cause the cigarettes to turn 180° and rotating said timing belt again around a circle to cause the fingers to open and release the turned cigarettes.

6. The method of turning cigarettes comprising rotating an endless timing conveyor belt provided with radial means attached to said belt to open and receive cigarettes to be turned, while maintaining the belt in a figure 8 configuration turning the cigarettes 180° while said belt travels in a straight run and releasing said turned cigarettes after the cigarettes have been turned 180°.

7. A cigarette turn around device for turning cigarettes end for end, comprising, means for delivering laterally a supply of cigarettes having their mouthpieces facing in one direction, a pair of timing pulleys rotatable in timed relationship with said conveying means, a twistable timing belt of yieldable material traveling in a figure 8 configuration on said timing pulleys and having pairs of spaced resilient, radially extending grippers adapted to open and receive the cigarettes from said conveying means as said belt travels over one pulley and to open and discharge said cigarettes as the belt travels over the opposite pulley, the runs of said belt being twisted 180° between said pulleys to effect a 180° turning of said cigarettes.

8. In a cigarette machine, a turnabout apparatus for turning cigarettes end for end, comprising transfer means to convey a supply of cigarettes laterally, a first timing pulley adjacent said transfer means, arranged to rotate in timed relationship to said transfer means, a second timing pulley spaced from said first pulley, rotatable in a plane parallel to said first pulley, an endless twistable timing belt of flexible material traveling over said pulleys in a figure 8 configuration, said belt having spaced pairs of fingers of flexible material with complementary cavities for carrying cigarettes therebetween, said fingers opening to receive the cigarettes from said transfer means when passing over said first pulley and to discharge the cigarettes after said cigarettes have been turned around 180° by said belt as said belt passes over said second pulley.

9. A cigarette turn around device for turning cigarettes end for end, comprising means for delivering laterally a supply of cigarettes with their tips facing in one direction, a pair of spaced timing pulleys rotatable in timed relationship with said conveying means, an endless twistable belt of twistable material having an inner face engaging with said pulleys and the opposite runs of said belt twisted in a figure 8 configuration, and an outer face provided with resilient gripper fingers for receiving the cigarettes from said delivery means and for discharging these after they have been turned around 180° with their tips facing in another direction.

10. A cigarette turn around device for turning cigarettes end for end, comprising means for delivering cigarettes with their tipped ends facing in one direction, a pair of spaced sprockets rotatable in timed relationship with said conveying means, an endless twistable belt of flexible material provided with spaced lugs on its inner face for engaging with said sprockets and pairs of spaced resilient grippers extending radially from the belt's outer face, the opposite runs of said belt being twisted in a figure 8 configuration, said grippers opening to receive the cigarettes from said delivery means when passing over one of said sprockets and closing to hold the cigarettes while these are being turned around 180° by said twisted belt, said grippers opening when passing over the other of said sprockets to discharge the cigarettes with their tips facing in another direction.

11. In a turn around device for turning cigarettes end for end, conveying means for delivering laterally mouthpiece cigarettes with their mouthpiece ends facing in one direction, a first sprocket adjacent said conveying means rotatable in timed relationship with said conveying means and a second sprocket spaced from said first sprocket, a twistable timing belt of yieldable material propelled by said sprockets, said belt having lugs spaced on its inner face for engaging with said sprockets, perpendicularly extending pairs of fingers mounted on the outer surface of said conveying means, the finger pairs are spaced from each other a distance sufficient to permit said finger pairs to twist 180° when said belt travels in a figure 8 configuration about said sprockets, whereby said finger pairs open to receive cigarettes from said conveying means at said first sprocket and close to gently convey the cigarettes to said second sprocket and open to discharge the cigarettes with their mouthpieces turned around upon reaching the second sprocket.

12. In a turn around device for turning cigarettes end for end, conveying means to laterally deliver mouthpiece cigarettes with their mouthpieces facing in one direction, a twistable yieldable timing belt having spaced pairs of gripper fingers for gripping the cigarettes discharged by said conveying means on its outer surface at predetermined distances and timing lugs spaced on its inner surfaces, a pair of sprockets rotatable in timed relationship with said conveying means, said belt being twisted 180° between said sprockets to turn the cigarettes end for end, guide means adjacent said conveying means for guiding the cigarettes onto said belt, and a flexible flap for retarding the movement of the cigarettes discharged from said gripper fingers.

13. In a turn around device for turning cigarettes end for end, conveying means to deliver laterally tipped end cigarettes with their tips facing in one direction, an endless timing belt of yieldable material twisted in a figure 8 configuration, said timing belt being provided with gripping means for receiving the cigarettes from said conveying means as the timing belt rotates about a radius and for holding said cigarettes as the belt tangentially leaves the radius and means for propelling the belt in a twisted configuration to turn the tipped ends 180°, said gripping means being adapted to discharge the cigarettes as the timing belt rotates about another radius and motive means coacting with said belt for rotating the belt, said

means being operable in timed relationship with said conveying means.

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