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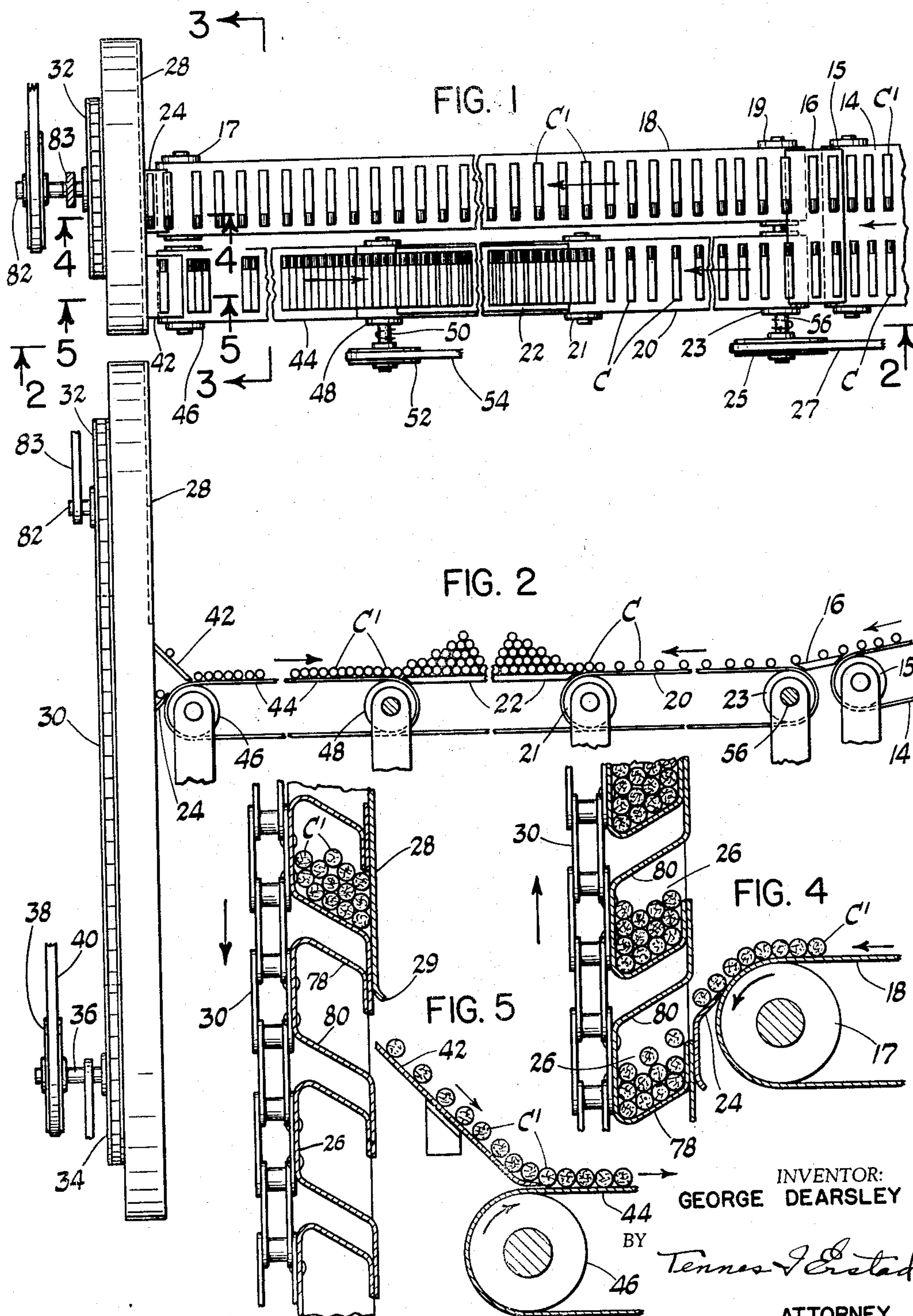
G. DEARSLEY

2,953,235

CIGARETTE TURNING DEVICE

Filed Feb. 27, 1957

3 Sheets-Sheet 1



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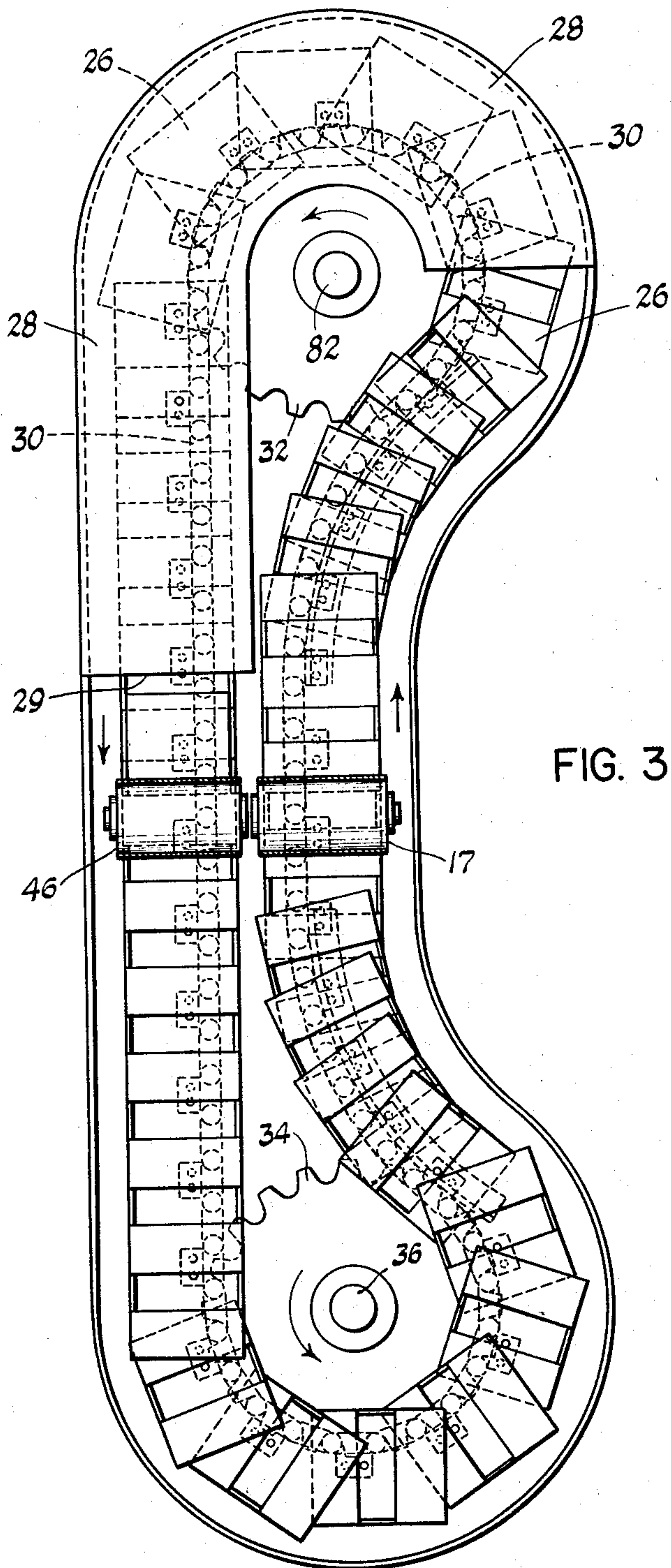
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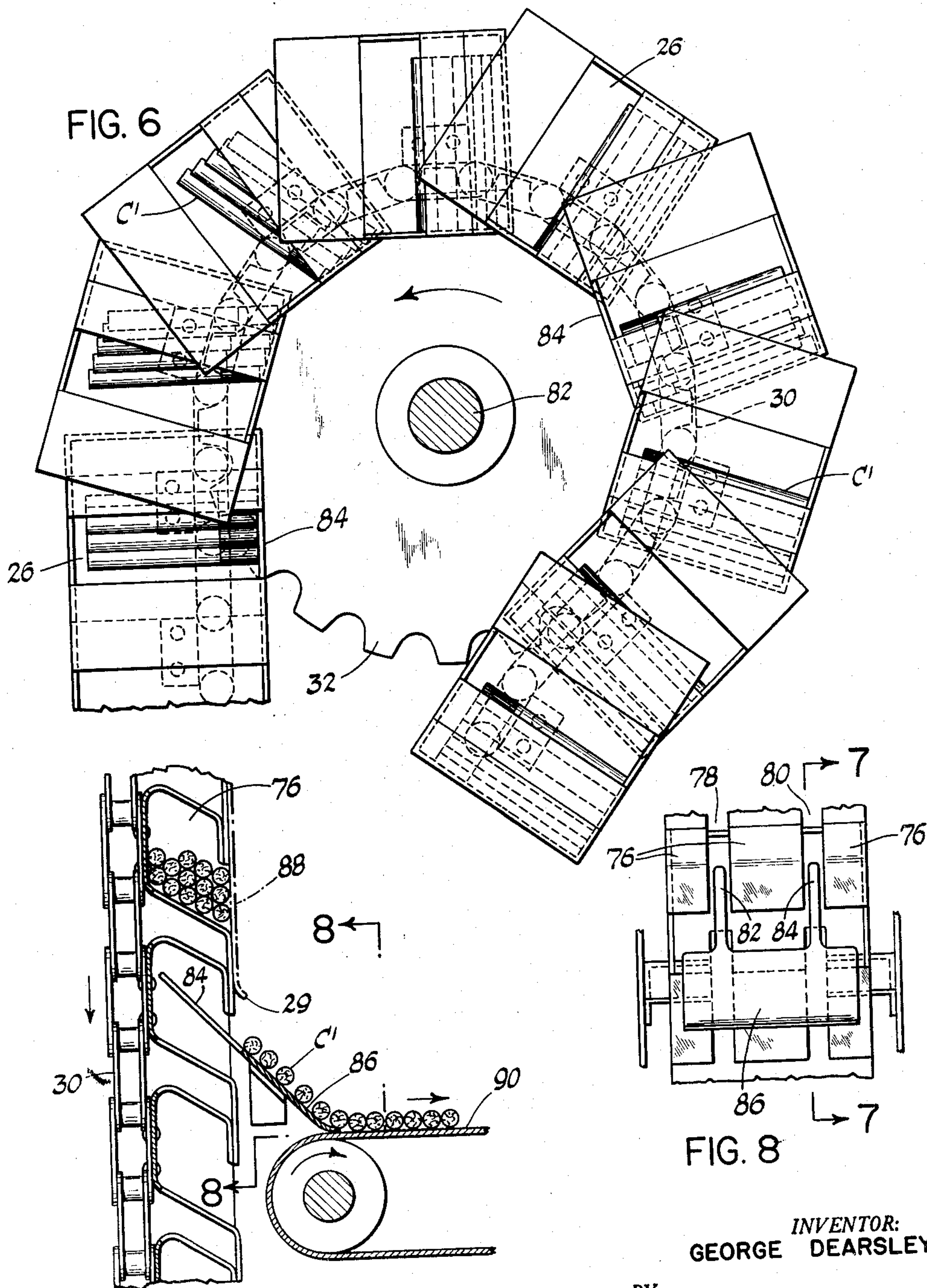


FIG. 7

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CIGARETTE TURNING DEVICE

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12 Claims. (Cl. 198—33)

This invention relates to the manufacture of cigarettes, and more particularly to a device and method for turning end-for-end tipped cigarettes received by a collector in a cigarette making machine so as to cause the tipped ends of all the cigarettes to face in the same direction.

In the cigarette manufacturing process, cigarettes having filters, cork tips, or hollow mouthpieces formed on one end are discharged and collected transversely in two rows onto a collector belt. Due to the method of manufacturing and cutting that is employed in making such tipped cigarettes, the tip ends of the cigarettes in each row face in opposite directions. The cigarettes in one row then have to be turned so that the tip ends of this row of cigarettes will face in the same direction as the tipped ends of the cigarettes in the other row before the tipped cigarettes having their tipped ends all facing the same direction are transferred in suitable containers to a cigarette packaging machine.

Various devices have been devised heretofore for turning cigarettes end-for-end. Some of these devices have been expensive to construct, others have been unreliable in handling cigarettes in excess of 1,000 per minute, and others have damaged the cigarettes in turning them end-for-end.

It is an object of this invention to provide a cigarette turning device which will be capable of turning cigarettes end-for-end at the same rate that they are manufactured by high speed cigarette making machines.

Another object is to provide a turn-around device which will operate at a very slow rate of speed in turning cigarettes but which will have a large capacity so that if any difficulties should be encountered in the operation of the turn around device such as a jam it would not interfere with the continued operation of the cigarette making machine, and there would be sufficient time for the difficulty to be rectified.

A further object of this invention is to provide a cigarette collecting and turn around device which will allow for normal cigarette inspection at the collecting table before the tipped cigarettes reach the turn around device.

Another object is to provide a collector with a turn around device which combines two rows of tipped cigarettes facing in opposite directions into a single row with all of the tipped ends of the cigarettes in the single row facing in the same direction.

A further object is to provide a "water wheel" type of cigarette turn around apparatus which travels at a slow rate of speed but turns a large number of cigarettes end-for-end.

A further object is to provide a conveying device for turning batches of cigarettes end-for-end.

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 ap-

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plied to corresponding parts throughout the several views which make up the drawings.

Fig. 1 is a plan view of the tipped cigarette collecting and turning apparatus.

Fig. 2 is a side elevation of the same.

Fig. 3 is a front elevation of the cigarette turning apparatus as seen from line 3—3 of Fig. 1.

Fig. 4 is a partial sectional side elevation taken on line 4—4 of Fig. 1 illustrating the cigarette feeding station of the turning apparatus.

Fig. 5 is a partial sectional side elevation taken on line 5—5 of Fig. 1 illustrating the cigarette discharge station of the turning apparatus.

Fig. 6 is a detailed partial front elevation of the upper end of the turning apparatus illustrating the cigarette carrying members driving the turning operation.

Fig. 7 is a front elevation of a modified cigarette carrying member in conjunction with a modified discharge guide.

Fig. 8 is a partial sectional side elevation of the turning device in conjunction with modified slotted cigarette carrying buckets.

My invention comprises delivery and receiving conveyor belts traveling in a horizontal plane and a turn around conveyor traveling in a vertical plane. While various suitable apparatus could be employed to carry my invention into effect, I have shown how this may be accomplished by means of a water wheel type of conveyor coacting with a pair of horizontal receiving and delivery belts.

In the embodiment used to illustrate the invention, two rows of tipped cigarettes C and C¹ are delivered from a cigarette making machine producing tipped cigarettes, such as, for example, that shown in my co-pending application Serial No. 509,293, filed on May 18, 1955, or from a machine such as shown in U.S. Patent No. Reissue 19,375, granted November 20, 1934, to W. B. Bronander. The tipped cigarettes in each row of cigarettes so discharged on the collecting belt 14 have the tipped ends in each row facing in opposite directions. The collecting belt 14 travels over a suitable pulley 15 in the direction indicated by the arrow.

These two rows of cigarettes C and C¹ are delivered from the collecting belt 14 over a bridge 16 onto a pair of collecting belts 18 and 20 traveling in the direction indicated by the arrows. The cigarettes C on collecting belt 20 are discharged onto a suitable collecting table 22 shown in Figs. 1 and 2.

Belt 18 travels over suitable pulleys 17 and 19 while belt 20 travels over suitable pulleys 21 and 23. Pulleys 19 and 23 are mounted on a common shaft 56 which is driven by a suitable pulley 25 through a belt 27 from a suitable source of power such as the main drive of a cigarette making machine.

The cigarettes C¹ on belt 18 are advanced to the slide 24 which they roll over into the receiving pockets or buckets 26. The floor 78 of the receiving buckets 26 have declining surfaces so that the cigarettes C¹ roll to the bottom and rear of the bucket. The ceiling surfaces 80 of buckets 26 have similar declining ejector surfaces. Each bucket is preferably of such size that it can hold at least ten cigarettes, thereby permitting the conveyor 30 to travel at a relatively slow speed. As the buckets or pockets 26 are elevated in the direction indicated by the arrow in Figs. 3 and 4, the cigarettes C¹ are confined in the buckets 26 by the retainer plate 28.

In the embodiment of the turn around conveyor, the individual buckets 26 are connected to an endless conveyor such as sprocket chain 30 traveling in the direction of the arrows (Figs. 2—5), over pulleys or sprockets 32 and 34. Sprocket 32 is fixedly mounted on shaft 82 which in turn is rotatably supported in bracket 83.

The sprocket 34 is fixedly mounted on a shaft 36 to which is also fixedly secured a second sprocket 38 which is driven by the belt or sprocket chain 40 in the direction indicated by the arrow. As the cigarettes slide down the slide 24 and come to rest in the bottom of pocket 26, they are moved upwardly in the direction indicated by the arrow in Fig. 4.

After the buckets 26 travel upwardly around an arc as shown in Fig. 3, and commence descending, the cigarettes C¹ roll down the declining surface 80, formerly the ceiling 80 on the upward travel, of the individual buckets 26 in the manner shown in Fig. 5. The cigarettes C¹ are prevented from falling out of the pockets 26 by means of the retainer plate 28 as they are turned around by sprocket 32 and commence their descent as shown in Fig. 5.

When the descending cigarettes C¹ which are held in their respective pockets by the retainer plate 28, as shown in Fig. 5, pass beyond the lower tip end 29 of the retainer plate 28, they roll down the declining discharge guide 42 onto the collecting belt 44 which delivers discharged cigarettes to the collecting table 22.

The cigarettes delivered to the collecting table 22 all have their tip ends facing in the same direction as the tipped cigarettes C¹ received from belt 20.

The belt 44 travels over pulleys 46 and 48. Pulley 48 is mounted on a shaft 50 which also has mounted thereon a pulley or sprocket 52 which is driven by a belt or sprocket chain 54, causing the belt 44 to travel in the direction indicated by the arrow.

The collecting belts 14, 18, 20, and 44 may be driven at the rate at which collecting belts are normally driven in a cigarette machine to allow an operator sufficient time to remove any defective cigarettes that are noted. Due to the large number of cigarettes C¹ that can be picked up in the collecting buckets or pockets 26, the turn around elevator, which resembles in effect a "water wheel," receives a large number of tipped cigarettes C¹ facing in one direction and conveys them around with the wheel at a relatively slow rate of speed whereby they are discharged facing in an opposite direction upon the collecting belt 44. Due to the large capacity of the vertical conveyor, Fig. 3, it is possible to avoid shutting down the operation of the cigarette making machine should the turn around apparatus, for one reason or another, temporarily become jammed, thereby giving the operator an opportunity to remove the jam without interfering with the continued operation of the cigarette making machine, and hence does not stop production.

In the modified form of my invention, shown in Figs. 7 and 8, the carrying buckets 76 have slots 78 and 80 formed therein. Forked arms or fingers 82 and 84 extend into these slots from the discharge slide 86. As the buckets 76 descend past the retainer plate 88, cigarettes carried thereby roll down the fingers 82 and 84 over the shield 86, onto the belt 90 which delivers them to the collecting table. This construction has the advantage that if any of the cigarettes hesitated in the pockets 76, they would be positively stripped therefrom by the fingers 82 and 84.

Due to the arrangement and capacity of the turn around device disclosed, it is capable of turning cigarettes C¹ end-for-end at a slow rate of speed, while still keeping up with the speed at which they are manufactured in a cigarette making machine, avoiding the formation of "collars," "indentations," or "wrinkles" in the finished cigarettes due to sudden acceleration and deceleration of the tipped cigarettes.

It will also be noted that all of the cigarettes C and C¹ issuing both from the cigarette making machine and the cigarette turning apparatus are collected in a single row facing in one direction so that there is no need for an operator to remove cigarettes from a plurality of rows. Also in the arrangement disclosed, it is possible for an operator to immediately inspect the cigarettes as they are

discharged from the maker in the same way she now does, thereby enabling adjustments in the maker to be immediately made without having to wait for the cigarettes to pass through the turn around device first.

From the foregoing description, it will be seen that I have provided a collecting conveyor traveling in a horizontal plane and an endless turn around apparatus operating in a vertical plane whereby cigarettes are delivered to one side of the vertical conveyor and carried upwardly and around the vertical plane, thereby turning the cigarettes end-for-end 180 degrees before discharging them back onto the horizontal conveyor. It will also be noticed another feature of this invention is that I am handling the cigarettes to be turned in batches, which procedure enables the speed of handling cigarettes to be decreased over that which was formerly necessary.

The invention hereinabove described may 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. A cigarette turn around device comprising collector belts for receiving rows of tipped cigarettes wherein the cigarettes in each row face in opposite directions, a pocketed conveyor traveling transversely to said collector belts, means for driving said transverse conveyor to swing cigarettes received in said pockets from one of said collector belts around an arc and to discharge said cigarettes therefrom so they face in a direction opposite to that in which they faced when received by said pocketed conveyor, another conveyor for receiving said discharged cigarettes and delivering them to a collecting area, and means for delivering the other row of cigarettes to said collecting area facing in the same direction in which they were facing when discharged from the cigarette making machine.

2. A cigarette turn around device for a cigarette making machine comprising a pair of conveyor belts traveling in opposite directions parallel to each other, a pocketed conveyor traveling in an endless path of travel transversely to the direction to which said conveyor belts travel, means for delivering cigarettes from the belt traveling towards said pocketed conveyor into the pockets of said conveyor, and a declined discharge guide positioned to receive cigarettes about to be discharged from said conveyor after they have been turned end-for-end and to deliver them to the conveyor belt traveling in the opposite direction, and a collecting station for collecting said turned around cigarettes.

3. A cigarette turn around device having the features provided for in claim 2 wherein said discharge guide has fingers interpassing said pockets to positively strip cigarettes from said pockets.

4. A cigarette turn around device for a cigarette making machine comprising a conveyor traveling vertically around an arcuate path of travel, one portion of said path of travel being in an upward direction while another portion of said travel being in a downward direction, a pair of belts for receiving two rows of tipped cigarettes as they are discharged from a cigarette making machine so that the cigarettes on one belt will have their tip ends facing in one direction and the cigarettes discharged on the other belt will have their tip ends facing in the opposite direction, means for delivering cigarettes from said first belt to the pockets in the conveyor as they travel in an upward direction, a third conveyor belt for receiving cigarettes from the pockets of said conveyor as the cigarettes descend with the pockets of said conveyor after the pockets and cigarettes have been turned end-for-end, and a collecting platform for receiving and accumulating cigarettes from said second and third collecting conveyor with the tip end of said cigarettes all facing in the same direction.

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5. A cigarette turn around device for a cigarette making machine comprising a pair of collecting belts traveling in the same direction for receiving two rows of cigarettes wherein the tip ends of each row face in opposite directions, a rotary member positioned at the end of one of said rows and traveling vertically, means on said rotary member for receiving cigarettes from one of said rows for turning the cigarettes end for end in a vertical path and discharging them onto a collecting device, and means for accumulating the turned cigarettes with the cigarettes of the other row to form an accumulation of cigarettes having all tipped ends facing in the same direction in a single stack.

6. A cigarette turn around device comprising a pair of conveying parallel belts traveling horizontally in opposite directions, an endless member traveling vertically positioned at the end of said pair of belts, means mounted on said endless member for picking up cigarettes from one of said belts and causing them to travel with said endless member in a 180 degree path of travel until they reach the second of said belts, and means for effecting a release of said cigarettes onto said second belt so as to cause cigarettes so picked up to face with their tips in the opposite direction, and an accumulating station for accumulating cigarettes with the tip ends all facing in the same direction.

7. A cigarette turn around device for a cigarette making machine for turning a row of tipped cigarettes end-for-end to cause all tipped cigarettes to be collected side-by-side with the tip ends facing in the same direction, comprising a pair of belts for conveying two rows of cigarettes having the tip ends thereof in each row facing in opposite directions, a collector for receiving and accumulating cigarettes received from one of said belts, a turn around device traveling in an endless path vertically positioned at the end of the other belt so as to receive the cigarettes from the other of said conveying belts and to convey said cigarettes around with said turn around device for approximately 180 degrees and to then discharge said cigarettes onto a collecting belt with the tip ends of the cigarettes facing in the opposite direction, and means for connecting said collecting belt with said collector to deliver cigarettes thereto, with the tip ends all facing in the direction desired.

8. A cigarette turn around device for a cigarette making machine comprising a pair of belts traveling in opposite directions, a conveyor traveling in an endless path, means formed on said conveyor for receiving batches of cigarettes from one of said belts and for conveying said batches of cigarettes around a 180 degree path of travel to deliver the batches of cigarettes to the other conveyor belt with the tipped ends facing in the opposite direction, a collecting table for receiving the cigarettes delivered from said other conveyor belt, and means for delivering to said collecting table tipped cigarettes received from the cigarette making machine and having the tips thereof facing in the same direction as the cigarettes received from said other conveyor belt.

9. A cigarette turn around device for a cigarette making machine comprising a conveyor traveling vertically around an arcuate path of travel, one portion of said

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vertical path of travel being in an upward direction while another portion of said path of travel being in a downward direction, a pair of belts for receiving two rows of cigarettes as they are discharged from a cigarette making machine with the tip ends in each row facing in opposite directions, pockets for carrying cigarettes in batches mounted on the conveyor, means for delivering cigarettes from one of said belts to the pockets on the conveyor as they travel in an upward direction, and means for receiving the cigarettes from the said pockets when they travel in a downward direction and means for combining the batches of cigarettes so received with the cigarettes on the first conveyor so as to accumulate all of the cigarettes with their tip ends facing in the same direction.

10. A cigarette turn around device comprising a horizontal collector belt system for receiving rows of transversely arranged tipped cigarettes from a cigarette making machine, a vertical traveling conveyor traveling in an arcuate path at its uppermost end, a plurality of cigarette containers carried by said conveyor, each container being individually attached to said conveyor to cause said containers to be turned up side down as they travel with said conveyor, thereby turning the contents of said container end-for-end, means for delivering tipped cigarettes from one of said rows to said containers, and means for receiving said cigarettes from said containers after they have been turned end-for-end and combining them with the tipped cigarettes of the other row.

11. A cigarette turn around device comprising a horizontal feed belt system, a vertical arcuate bucket conveyor system, means for the feeding of tipped cigarettes into the buckets prior to their upward travel, means for discharging the cigarettes from said buckets after they have been turned in an arc and have traveled in a downward direction, means for accumulating the end-over-end turned cigarettes, and a horizontal conveyor for combining tipped cigarettes having their tip ends facing in the same direction with the tip cigarettes turned end-for-end.

12. A cigarette turn around apparatus comprising a conveyor for receiving rows of tipped cigarettes wherein the cigarettes in each row have their tip ends facing in opposite directions, a conveyor traveling in a vertical path for receiving cigarettes from one of said rows and turning them end-for-end vertically and combining them with the tipped cigarettes in the other row, pockets having slots formed therein mounted on said vertical conveyor, a stripping member having fingers extending into the slots of said pockets to positively strip cigarettes therefrom as said pockets descend past said fingers and a collecting table for combining the turned cigarettes with the cigarettes of the other row to form a row of stacked cigarettes having all their tipped ends facing in the same direction.

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