June 13, 1944. F. DI IANNI 2,351,410

POSITIVE TOBACCO CONVEYER

Filed Sept. 30, 1939

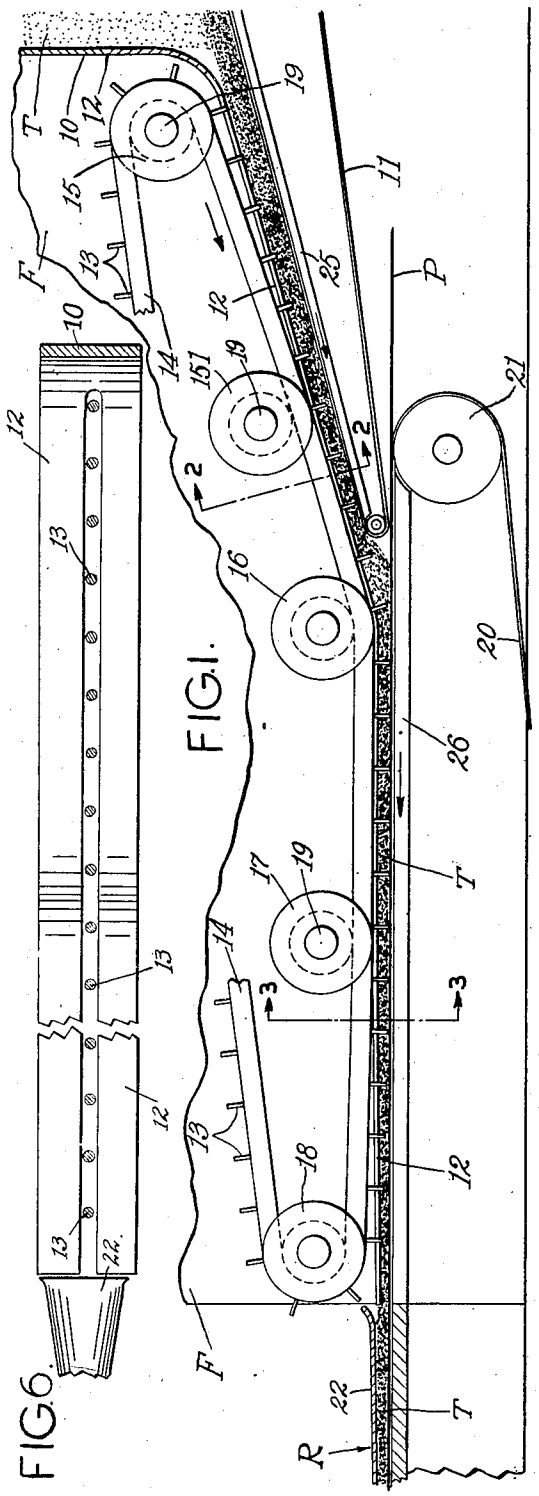

FIG. 1.

FIG. 6.

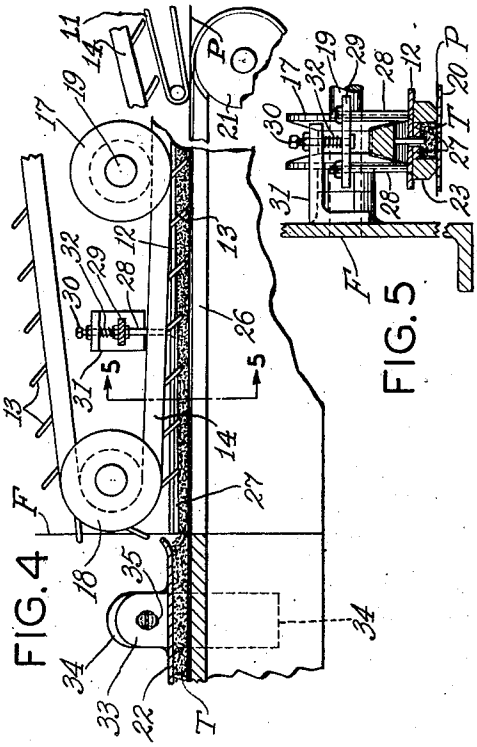

FIG. 4.

FIG. 5.

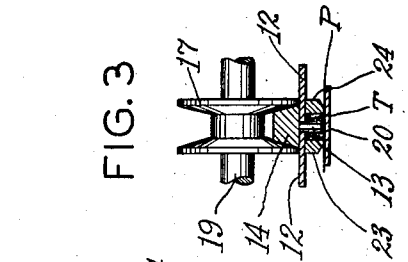

FIG. 3.

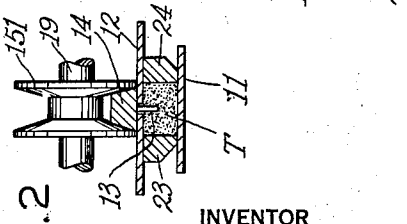

FIG. 2.

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Patented June 13, 1944 2,351,410

UNITED STATES PATENT OFFICE

2,351,410

POSITIVE TOBACCO CONVEYER

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Application September 30, 1939, Serial No. 297,253

17 Claims. (Cl. 131—84)

This invention relates to cigarette machines, and more particularly to improvements in tobacco feeding mechanisms used for advancing a stream of tobacco into the rod forming device of continuous rod cigarette machines.

In feeding shredded cigarette tobacco to cigarette rod forming mechanism there is often a tendency on the part of the tobacco to hesitate in its forward travel, particularly as it enters under the rod former tongue, and this tends to create inequalities in the resulting cigarette rod. It is, therefore, the main object of this invention to provide means for positively advancing tobacco to rod forming mechanism and preventing any hesitation or temporary holding up of the tobacco as it travels to the rod forming device.

It is a further object of the invention to provide novel conveying means for feeding shredded cigarette tobacco, and at the same time make it practically impossible for the tobacco being fed to get displaced because of friction or other causes, and in this manner prevent the formation of unsatisfactory cigarettes.

A further object of the invention is the provision of an improved conveyer device supporting elements which engage the tobacco and propel it forward into the cigarette rod forming mechanism.

It is an additional object of the invention to provide a cigarette tobacco feeding conveyer mechanism such as a carded belt conveyer, wherein pins carried thereby will be imbedded in the stream of tobacco and move it forward in compressed condition through the feeding channel to the rod forming mechanism without the formation of inequalities or holes due to any hesitation of the tobacco as it enters the former.

The invention also consists in the provision of associated tobacco forwarding means so arranged that one may be moved relative to another and at the same or faster speed in order to build up a tobacco rod at a point adjacent the rod former which is greater in density than the stream of tobacco as it enters between the forwarding means.

The invention also contemplates the use of adjustable devices which will make it possible to change the cross section of the stream of tobacco forwarded by the tobacco conveying device so that changes may be made in the compaction of the tobacco fed to the rod former, under the influence of a pin belt conveyer which positively propels the tobacco to the former.

With these and other objects not specifically mentioned in view, the invention consists in certain combinations and constructions which will be hereinafter fully described, and then specifically set forth in the claims hereunto appended.

In the accompanying drawing which forms a part of this specification, and wherein the several reference characters designate the same or like elements:

Figure 1 is a partial side elevation of the improved tobacco conveyer;

Figure 2 is a sectional end elevation taken on line 2—2 of Figure 1;

Figure 3 is a sectional end elevation taken on line 3—3 of Figure 1;

Figure 4 is a partial side elevation of a modified form of my invention;

Figure 5 is a sectional end elevation taken on line 5—5 of Figure 4; and

Figure 6 is a partial sectional plan view showing the spaced tobacco stream confining plates forming a part of the tobacco feed chute, and their relationship to the rod forming tongue.

In the embodiment selected for purposes of illustration my invention is shown as a device attached to and forming a part of a cigarette machine of the general type shown and described in Smith patent, No. 1,892,257, granted December 27, 1932, although it is readily adapted for use on any other rod cigarette machine.

Referring to the drawing, the entire shower of tobacco T falling through chute 10, is angularly intercepted by the inclined upper run of belt 11 traveling over a support 25. This belt and plates 12 are spaced vertically from each other and comprise a compressing chute or trough through which the tobacco T, resting on belt 11, is advanced towards the rod forming mechanism designated generally at R. In the embodiment illustrated plates 12 form a part of chute 10 and extend downwardly therefrom, as shown in Figures 1 and 6, above belts 11 and 20. Plates 12 are so located that they provide a longitudinal slot through which tobacco propelling elements, such as pins 13, which may be either rounded or blunt on their ends, fixed to a conveyer 14, project and engage the tobacco. Belt 11 is shown converging towards plates 12 in order to compress the tobacco progressively as it moves through the trough.

Conveyer 14 runs over a pulley 15, mounted on frame F, and is suitably driven from the drive of the cigarette machine (not shown). The conveyer illustrated is an endless belt which is trained over idler pulleys 151, 16, 17 and 18, all of which, including the driving pulley 15, are mounted on shafts 19 supported by the machine

frame F. In order to prevent tobacco from working up between belt 14 and the top of plates 12, the plates have been bent up towards the wall of chute 10 (Figure 1). Belt 14 is so located with respect to the mat of tobacco, that pins 13 thereon move into engagement with the tobacco, with a movement substantially perpendicular to said mat of tobacco beginning at that point where plates 12 have been turned up toward chute 10 (Fig. 1). In this manner the pins engage and aid in advancing the tobacco stream, and thereby prevent hesitation on the part of the tobacco, the formation of holes and other irregularities in the mat which would be carried through the machine and result in the production of unsatisfactory cigarettes. The action of the pins 13 also tends to eliminate jamming of the tobacco at the paper contact point, or that point where the tobacco leaves the belt 11 and is deposited on the paper web P.

The rod forming tape 20 running over roller 21, is driven by a tape wheel of conventional type, such for instance as shown in Rundell Patent No. 1,851,264, granted March 29, 1932, and forwards the cigarette paper under the lower run of belt 14 in order to position it to receive the stream of tobacco T as it issues from the trough formed by the upper run of belt 11 and plates 12. The stream of tobacco is further compressed as it moves towards the rod former due to the action of pins 13, tape 20, and plates 12, which converge towards tape 20 whose upper run is supported by member 26. Belts 11 and 14 and the tape 20 may be driven at the same speed so that the compressed tobacco stream or mat T and the cigarette paper P have the same speed when coming together and when entering the tongue 22 of the rod former. However, if desired, one or more of the belts may be driven at different speeds. For example, if belts 11 and 14 be driven at the same speed, though faster than belt 20, the tobacco will be compacted axially in the direction of its advancing movement between plates 12 and belt 20.

The pins 13 on belt 14 are provided for the purpose of engaging the tobacco stream or mat on the belts 11 and 20 and forwarding it to the rod former with a positive forwarding manner in order to overcome any likelihood on the part of the tobacco to hesitate in its forward movement. Pins 13 are so arranged with respect to their supporting belt 14 and belt 20 that they extend towards and move closely adjacent tape 20 with a slight running clearance. This arrangement insures uniform and positive control by belt 14 over the tobacco stream advancing to the rod former.

Referring to Figure 1, it will be observed that the pins 13 move into the tobacco with a movement that is substantially perpendicular to the tobacco mat in order not to form holes or tear the mat, and that at the point of exit of the pins adjacent the rod former, the pins are also moved with a similar movement for a like reason. Plates 12 also act as strippers to prevent any tobacco from adhering to the propelling members, as they move out of engagement with the tobacco mat.

The tobacco stream, at all times during its advance from the chute 10 to the rod forming tongue, is confined laterally by means of side guide plates 23 and 24 (Figures 2 and 3) which may be mounted in a manner similar to that disclosed in United States Patent No. 1,998,146, granted April 16, 1935, to Smith.

Although the pins of the carded belt conveyer 14 are usually arranged substantially at right angles to the belt, in the modification shown in Figures 4 and 5, pins 13 may be inclined with respect to the belt 14. Adjacent the exit end of the compression trough formed by belt 14 and tape 20, filler plates 27 are secured to plates 12 in order to make it possible to adjust the cross section of the trough and control the tobacco moving therethrough. In this manner it is possible to provide for sidewise or lateral compaction of the tobacco filler as it moves to the rod former tongue 22. In order to provide for adjusting plates 12 to and from tape 20, studs 28 are secured to the plates as shown in Figure 5, and fixed to the studs is a bar 29, which has connected thereto an adjusting screw 30. A spring 32 bearing against bar 29 and bracket 31, which supports the adjusting device, maintains plates 12 in proper position relative to tape 20. In order to compensate for the variation in height when plates 12 are raised and lowered, filler plates 27 are secured to plates 12 and move between side guides 23, 24 (Figs. 4 and 5).

When plate 12 is lowered, plate 27 will descend between the side walls of the channel and compact the filler therein. When plate 12 is raised, plate 27 will prevent the filler from escaping over the side walls 23 of the channel.

Under some conditions it may be advisable to adjust the rod former tongue vertically in conjunction with the plates 12, and hence a mount 34 is provided to support tongue member 22, which may have a support lug 33 having an elongated slot 35 for raising and lowering the tongue on the support.

The invention above 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 concrete embodiments of the same. It is not, therefore, to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. In a cigarette machine, the combination with a traveling web having an extended portion for carrying tobacco, of means for guiding a shower of tobacco onto said web, spaced members positioned above said web and forming therewith a trough for the tobacco on said web, spaced tobacco stream confining plates positioned above said spaced members and web to form therewith an elongated trough substantially enclosed on all sides, and tapered flat members fixedly connected to said confining plates and located beneath said plates and in a plane above said web, said tapered flat members being constructed and arranged to project downwardly between said spaced plates to progressively compact tobacco passing through said trough.

2. In a cigarette machine, the combination with a traveling web having an extended portion, of means for guiding a shower of tobacco onto said web, a slotted compression device positioned above and tilted at one end toward said web, said compression device being constructed and arranged to coact with said web to progressively compress tobacco resting thereon, a traveling member located above said device and extending along the extended length of a substantial portion of said web, and means on said member projecting through said slot for propelling tobacco on said web.

3. In a cigarette machine, the combination with a traveling web traveling over a path hav-

ing at least one elongated portion for conveying tobacco, of means for guiding a shower of tobacco onto said web, laterally spaced plates positioned above said web and forming therewith a tobacco compressing trough for tobacco resting on said web, an endless conveyer made of a flexible material located above said plates and extending along the length of at least one of said elongated portions, and a plurality of tobacco engaging and propelling elements mounted on said conveyer, said elements being constructed and arranged to project into the tobacco on said web and move it forward through said trough in timed relation to the movement of said web in order to maintain the stream of tobacco thus formed substantially uniform in cross section and longitudinal extent.

4. In a cigarette machine, the combination of traveling conveying means for carrying tobacco over an elongated path of travel, of a chute for guiding a shower of tobacco onto said means, tobacco compressing mechanism positioned above and tilted toward said means for progressively compacting the tobacco as it travels along on said means, an endless flexible traveling member positioned above said means and extending along said means for a substantial portion of the elongated path of travel of said means, and projections connected to said member for engaging and propelling tobacco on said means to form a uniformly compacted cigarette rod.

5. In a cigarette machine, the combination with an endless belt conveyer adapted to move at a given speed, of means for guiding a shower of tobacco onto said belt conveyer, a second belt conveyer located above said first-named belt conveyer, tobacco propelling members fixed to said second-named belt conveyer and projecting a substantial distance into the tobacco on said first-named belt conveyer and traveling therewith, and means coacting simultaneously with said belt conveyers for compressing said tobacco.

6. In a cigarette machine, the combination with a rod forming tongue, of traveling web means having at least one portion thereof traveling along a substantially straight path, means for guiding a continuous shower of tobacco to said traveling web means to form an elongated stream of tobacco filler, stationary members for gradually compressing said tobacco on said traveling web means, a traveling conveyer having a substantially straight portion spaced above that portion of said traveling web means having a straight path of travel and traveling in the same direction as said traveling web means, and a plurality of tobacco propelling elements connected to said conveyer entering into the tobacco on said web at a portion substantially adjacent to the means for guiding a shower of tobacco on said web and withdrawing from said elongated stream of tobacco filler at a portion substantially adjacent to said rod forming tongue.

7. In a cigarette machine, the combination with an endless traveling web, of means for guiding a continuous shower of tobacco onto said web, means for compressing the tobacco on said web into a substantially uniform mat, elements projecting through said compressing means and traveling along a substantially straight path for a portion of their travel for engaging and propelling said tobacco, said elements being so constructed and arranged that the tobacco mat is engaged thereby without disturbing the regularity of the tobacco forming said mat.

8. In a cigarette machine, the combination with a traveling web, of means for guiding a shower of tobacco onto said web, a tobacco compressing member located above said web, a conveyer positioned above said web, a plurality of pins secured to said conveyer and arranged to engage and propel tobacco beneath said member, and means mounting said conveyer so that the pins move into contact with said tobacco in a direction along the axis of the respective pins approximately at right angles with the plane of said member without pulling or tearing the tobacco on said web.

9. In a cigarette machine, the combination with a traveling conveyer, of means for guiding a shower of tobacco onto said conveyer, a tobacco compressing member located above said conveyer, a rod forming tongue, a second conveyer mounted above said member, a plurality of pins secured to said second-named conveyer and arranged to engage and propel tobacco on said first-named conveyer, means positioning said second-named conveyer for travel above said member, and means mounting said second-named conveyer so that said pins move into contact substantially perpendicular to the tobacco on said first-named conveyer at the point of introduction of tobacco beneath said member, and means mounting said second-named conveyer adjacent said rod forming tongue so that said member acts as a stripper to prevent the removal of tobacco from beneath said member as said tobacco is fed to said tongue.

10. In a cigarette machine, the combination with a lower traveling tobacco conveying device, of a chute for guiding a continuous shower of tobacco onto said device, an endless conveyer having a portion traveling along a substantially straight path of travel located above said device and coacting with said lower conveying device, a compression member coacting with said device and conveyer to compress the tobacco on said device, tobacco propelling elements projecting into the tobacco through said compression member carried by said conveyer and assisting said device in advancing said tobacco, a rod forming tongue located adjacent one end of said member, and means for adjusting said tongue and member for movement to and from said device.

11. In a cigarette machine having a rod forming tongue, the combination with an endless conveyer system having at least one portion thereof traveling along a substantially straight path, of a chute for guiding a shower of tobacco onto said conveyer system, tobacco propelling mechanism having a portion constructed and arranged to travel along a substantially straight path located above said system, a plurality of tobacco propelling elements secured to said mechanism and traveling therewith for projecting into the tobacco on said conveyer system to maintain it uniform as it travels along said conveyer system, and compression members coacting with said mechanism and system, said members comprising an elongated plate extending above said system and spaced therefrom, and side guides through which tobacco is moved by said system and mechanism, and means for withdrawing said elements from the tobacco filler mat without disturbing the uniforming thereof before it enters a rod forming tongue.

12. In a cigarette machine, the combination with a rod forming mechanism, of a conveying device for feeding tobacco to said mechanism, tobacco compressing members coacting with said

device, a conveyer positioned above and extending along said device, a plurality of tobacco engaging and propelling elements secured to said conveyer and arranged to assist in advancing tobacco on said device to said mechanism, and means for mounting said conveyer above said device at the point of entry and discharge of tobacco from said device, said means being so constructed and arranged that the tobacco engaging elements thereon move into and out of the tobacco in planes substantially perpendicular to said device.

13. In a cigarette machine, the combination with a traveling web and a rod former, of means for guiding a shower of tobacco onto said web, a tobacco compressing member located above said web, a conveyer having a portion thereof traveling along a substantially straight path of travel above said web, a plurality of inclined pins secured to said conveyer and arranged to engage and propel tobacco beneath said member while moving rectilinearly, and means mounting said conveyer so that the pins move into contact with said tobacco without disturbing the uniformity of the filler and withdraw from said filler at an angle so as not to pull or tear the filler before it enters the rod former.

14. In a cigarette machine, the combination with an endless conveyer adapted to travel at a given speed, of means for guiding tobacco onto said conveyer, a second conveyer located above and extending along said first-named conveyer and traveling at a faster rate of speed than the first-named conveyer, tobacco propelling members fixed to said second-named conveyer and projecting a substantial distance into the tobacco on said first-named conveyer while traveling in a substantially rectilinear path, and means coacting with said conveyers for compressing said tobacco.

15. In a cigarette machine having a rod forming tongue, the combination with traveling web means having a portion traveling along a substantially straight path, of a device for depositing a shower of tobacco on said traveling web means, means for compressing said tobacco progressively as it travels along on said web means, and flexible traveling means having a portion thereof traveling along a straight path mounted above said web means, projections connected to said flexible traveling means to project into said tobacco for propelling tobacco forward to said rod forming tongue, and a stripper located adjacent said tongue for removing tobacco from said projections.

16. In a cigarette machine, the combination with an endless conveyer adapted to travel at a given speed, of means for guiding a shower of tobacco onto said conveyer, a second conveyer located above and extending along said first-named conveyer, tobacco propelling members fixed to said second-named conveyer and projecting a substantial distance into the tobacco on said first-named conveyer while traveling in a substantially rectilinear path, and means coacting with said conveyers for compressing said tobacco.

17. In a cigarette machine, the combination with an endless conveyer, of means for feeding tobacco onto said conveyer, a second conveyer located above said first-named conveyer, an elongated adjustable compression member provided with a longitudinal slot extending along said member, means for mounting said member to extend beneath said second-named conveyer and above said first-named conveyer, said member having at least one portion positioned at a slight angle with respect to said second-named conveyer to compress the tobacco on said first-named conveyer, a plurality of tobacco propelling members secured to said second-named conveyer and projecting downwardly through said slot in said compression member into said tobacco compressed between and advanced by said first-named conveyer and said second-named conveyer, a rod forming tongue adjacent said compression member constructed and arranged to receive tobacco advanced by said first and second named conveyers, and means for adjustably mounting said tongue and member for vertical movement to and from said first-named conveyer.

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