Dec. 21, 1954 W. A. DAVIS 2,697,439

TOBACCO SEPARATING AND TEARING APPARATUS

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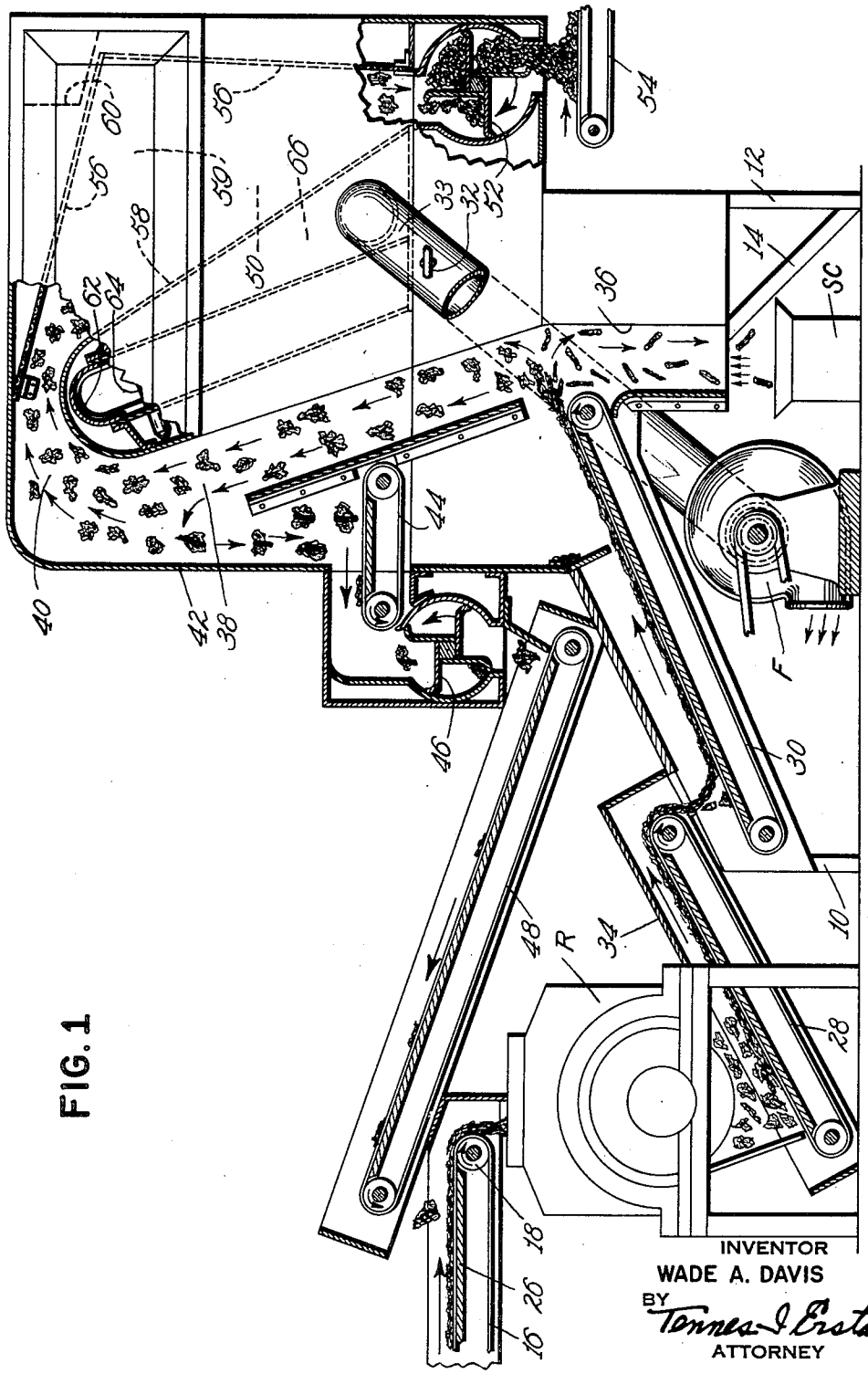


FIG. 1

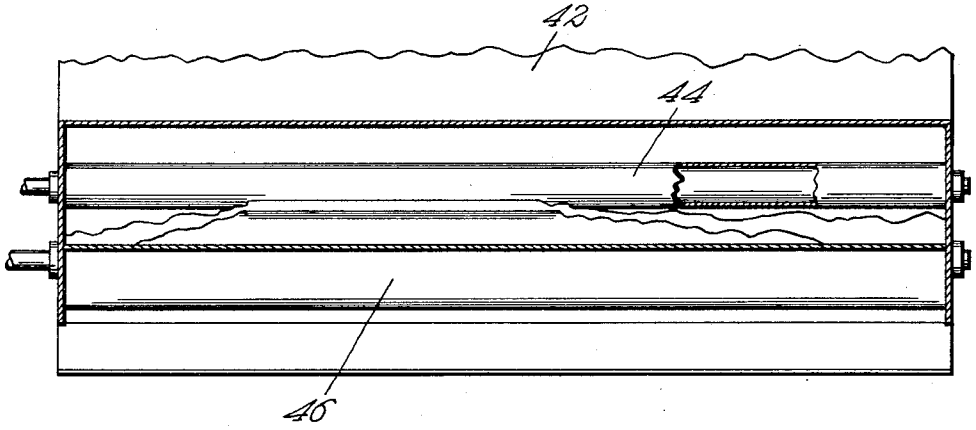
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FIG. 2



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United States Patent Office 2,697,439
Patented Dec. 21, 1954

2,697,439

TOBACCO SEPARATING AND TEARING APPARATUS

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Application July 6, 1951, Serial No. 235,428

6 Claims. (Cl. 131—146)

The present invention relates to improvements in tobacco leaf ripping and separating apparatus, and more particularly, to devices for removing laminae from the stems of tobacco leaves, and for re-tearing incompletely torn leaves.

Heretofore apparatuses for re-tearing incompletely torn tobacco leaves have been of such design that they have caused tobacco leaves to be bunched together before re-tearing which has caused the leaves being processed a second time to be threshed into undesirable small pieces. One of the reasons for this was due to the fact that the conveyor mechanism was long and elongated, thus, causing a narrowing of the tobacco stream being conveyed to the tobacco ripper for re-tearing. While this facilitated bringing the tobacco back for re-tearing, it did not prevent such retorn tobacco from being broken up into a mass of small pieces. This was due to the fact that all the tobacco conveyed back to the re-ripper was deposited in a concentrated mass in the re-tearing apparatus and thus subjected to a considerable beating action that would not have occurred had the tobacco been more dispersed on being reintroduced to the ripper a second time.

An object of this invention is to provide a separating apparatus which will be very efficient in separating laminae from clean stems and which will effect a separation of stems having laminae adhering thereto from the clean laminae without stems so that the partially torn leaves will be conveyed back to the re-ripping apparatus in a manner which avoids having the partially ripped tobacco broken up into undesirable small pieces.

Another object of this invention is to provide a separating apparatus which will have a flat conveyor extending across the entire width of the separator for receiving incompletely torn tobacco leaves and conveying them in a broad stream back to the tobacco ripper for re-tearing.

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 sectional side elevation of the tobacco separator and reprocessing apparatus.

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

The separating and re-tearing apparatus that I have disclosed in the drawings accompanying this specification is particularly well suited for separating tobacco leaf lamina and other materials from a continuous stream of ripped or torn tobacco and removing incompletely torn tobacco leaves and conveying said incompletely torn leaves in a wide stream back to the re-tearing apparatus.

The apparatus consists of a frame having legs **10** and **12** and suitable braces **14** which support the unit above the floor. Tobacco leaves to be torn and re-torn are conveyed in a continuous stream by conveyor belt **16** which travels over suitable rollers **18**. The roller **18** is supported in suitable bearings (not shown) and rotary movement is imparted thereto in the direction indicated by the arrow. A suitable support plate **26** is provided for supporting the belt **16** which carries the tobacco. The tobacco is discharged from belt **16** into a suitable ripper such as is indicated by the symbol R which rips the tobacco and discharges the torn tobacco onto a conveyor belt **28**. The conveyor belt **28** carries the tobacco in the direction indicated by the arrow onto a second conveyor belt **30** which in turn further advances the tobacco in the direction indicated by the arrow and discharges the torn tobacco into an air stream at the discharge end of the conveyor belt. The velocity of this air stream is regulated by the speed of the suction fan F and also by the setting of the damper control handle **32** in duct **33**. The conveyor belts **28** and **30** are enclosed in a housing **34** and thus prevents air from entering the separating apparatus at this area of the machine.

The clean stems fall downwardly through chute **36** into a suitable stem collector SC. The rest of the material is elevated upwardly by the rush of air through channel **36** toward the expanded area **38** where the air velocity drops down due to the greater expanse. The air velocity, however, is sufficient to elevate all the leaf portions which do not have stems up around the bend **40** in a manner similar to that disclosed in co-pending application S. N. 729,818 filed by O. E. Eissmann on February 20, 1947, now matured as U. S. Patent No. 2,643,768, issued June 30, 1953, into a second expansion chamber **50**.

The leaf portions, which still have some stem pieces attached are blown towards the front wall **42** due to the lower velocity at this portion of the chamber where they drop downwardly onto the conveyor belt **44**. The conveyor belt **44** extends across the entire width of the separator housing and forwards the tobacco leaves so received in the direction indicated by the arrow to discharge the same into a revolving gate **46**. The gate **46** also extends across the entire width of the separator housing and discharges tobacco leaves onto a conveyor belt **48** which is of the same width as the revolving air gate **46**.

The conveyor belt **48** discharges the tobacco leaves onto the belt **16** which carries them back to the tobacco ripping apparatus R for re-tearing. Since no air is entering the separator immediately above the conveyor belt **44**, the partially torn leaves immediately commence settling onto the belt **44** as soon as they have departed from the upward currents caused by the suction fan F.

The clean bladed portions of the tobacco leaf which have no stems attached thereto are carried upwardly around the bend **40** into the air chamber **50** where they settle out of the air stream and fall downwardly into an air gate **52** which discharges the clean tobacco leaf lamina onto a collector belt **54**. Lint and feathers are screened from the air stream by means of screens **56** in the same manner as is described in the aforementioned application S. N. 729,818. Heavy particles of sand fall downwardly onto the inclined wall **58** which may be of perforated design to allow the sand to be separated therefrom in a manner described in the aforementioned application 729,818. The air pulled through the screens **56** enters into a duct **59** through an opening **60** and is conveyed to a second opening **62** which connects with the intake side **64** of a bank of small diameter cyclone separators.

Air is exhausted from the outlet end of the small diameter cyclone separators through a duct **66** out through the exhaust fan F.

This invention has the advantage that partially torn tobacco leaves are not bunched together when separated from the completely torn leaves and are conveyed back to the ripping apparatus for re-tearing in the same dispersed manner. As a consequence, undesirable recycling of such leaves is thereby avoided because the ripper receives these leaves for re-tearing across a wide area.

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 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. Apparatus for ripping, separating, and re-ripping incompletely torn tobacco leaves comprising, a tobacco separator having an air passageway formed therein, means for moving a stream of air through said air passageway, a tobacco ripper, means for conveying tobacco leaves to said ripper, a conveyor system for receiving torn tobacco leaves from said ripper and discharging said tobacco leaves into the air stream passageway of said tobacco separator, said air passageway having an expanded portion for effecting

separation of incompletely torn tobacco leaves from said air stream, a collector belt extending across substantially the entire width of the separator positioned under said expanded chamber for receiving incompletely torn tobacco leaves settling out of said air stream while preventing air from entering said separator at this area, and a second conveyor system for returning said incompletely torn tobacco leaves back to said ripping apparatus for re-tearing.

2. Apparatus for ripping, sorting, and re-ripping incompletely torn tobacco leaves comprising, a tobacco ripper, a conveyor system receiving torn tobacco leaves from said ripper and conveying them to a discharge station, a tobacco separator having an air passageway into which said torn tobacco leaves are discharged by said conveyor, said passageway having an expanded area, means for moving a stream of air through said air passageway and said expanded area to elevate torn tobacco leaves through said passageway and area, a conveyor belt extending across the entire width of said tobacco separator and positioned below said expanded area for receiving incompletely torn leaves, an air gate of the same width as said conveyor belt for receiving and discharging said incompletely torn tobacco leaves, and a second collecting belt system for receiving said incompletely torn leaves and conveying them back to said ripper for re-tearing.

3. Apparatus for ripping, classifying, and re-tearing incompletely torn tobacco leaves comprising, a tobacco ripper, a classifier into which ripped tobacco leaves are discharged, said classifier having an air passageway formed therein, means for moving a stream of air through said air passageway, an expanded chamber for separating partially torn tobacco leaves from the torn tobacco leaves delivered to said classifier, a collector belt extending across substantially the entire width of the separator and positioned under said expanded chamber for receiving incompletely torn leaves separated from said torn tobacco, and a conveyor system for receiving incompletely torn tobacco leaves from said collector belt and conveying them back to the ripper for re-tearing.

4. Apparatus for ripping, classifying, and re-tearing incompletely torn tobacco leaves comprising, a pneumatic classifier for separating laminae, stems, and stems having laminae attached thereto into separate categories,

said classifier having an air passageway formed therein, means for moving a stream of air through said air passageway, and a conveyor system having a width which extends across the entire width of said classifier for receiving the stems having laminae attached thereto which settled out of the air stream and conveying them back to the re-tearing apparatus without narrowing the width of the stream.

5. Apparatus for ripping, classifying, and re-tearing incompletely torn tobacco leaves comprising, a pneumatic classifier for separating laminae, stems, and stems having laminae adhering thereto into separate categories, a tobacco leaf ripper, a conveying system for delivering a stream of torn tobacco leaves to said classifier having an air passageway formed therein, an expanded chamber extending across the entire width of said pneumatic classifier for effecting separation of incompletely torn tobacco from the stream of torn tobacco, and a conveyor system of the same width as said expanded chamber for receiving stems and laminae adhering thereto settling out of the air stream of said air passageway and conveying said stems and laminae adhering thereto back to the ripper without narrowing the width of said stream.

6. Apparatus for classifying torn tobacco leaves into separate categories for stems, laminae, and laminae having stems attached thereto comprising, a tobacco ripper, a conveyor system for delivering ripped tobacco leaves to said ripper, a pneumatic separating chamber for causing stems having laminae adhering thereto to settle downwardly in said chamber, and a second conveyor system of the same width as said chamber to receive said stems and lamina and convey them back to the ripper for re-tearing without reducing the width of said stream.

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