Feb. 5, 1957 S. BENNING ET AL 2,780,227

METHOD OF FORMING BUNDLES OF TOBACCO LEAVES

Original Filed July 16, 1953 2 Sheets-Sheet 1

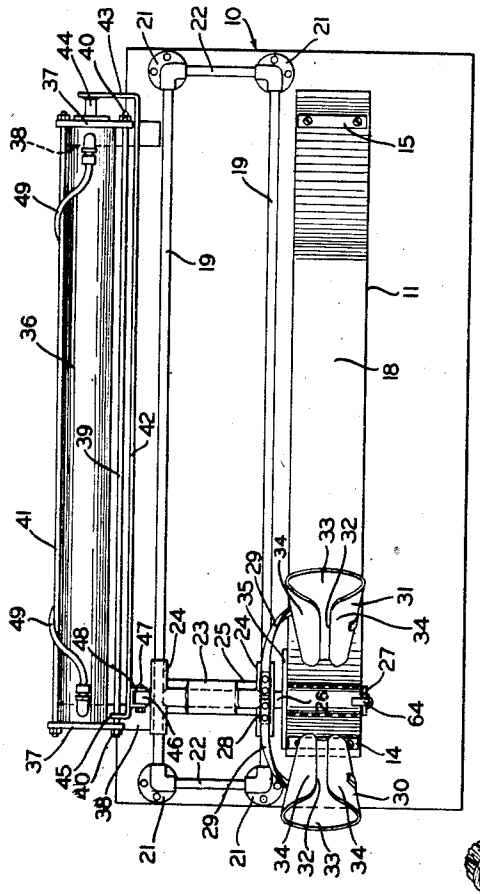


Fig. 1

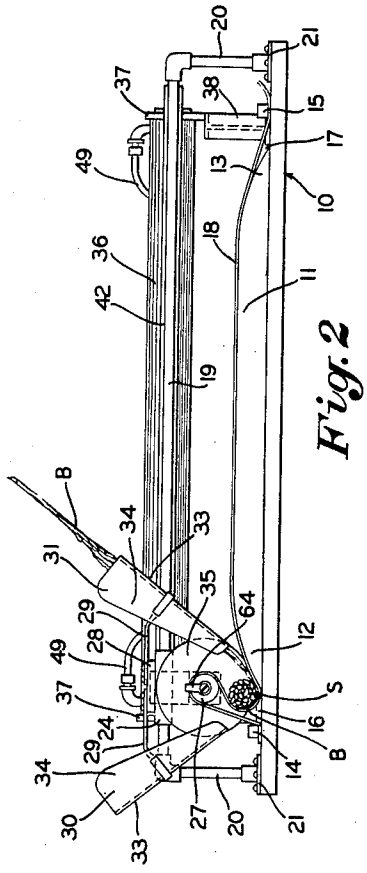


Fig. 2

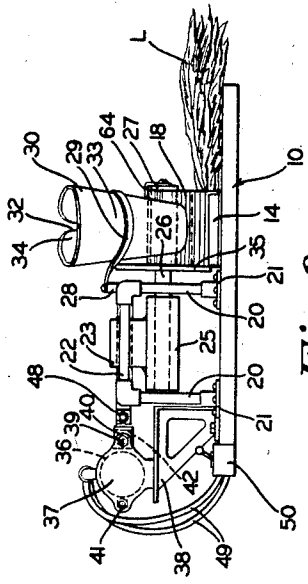


Fig. 3

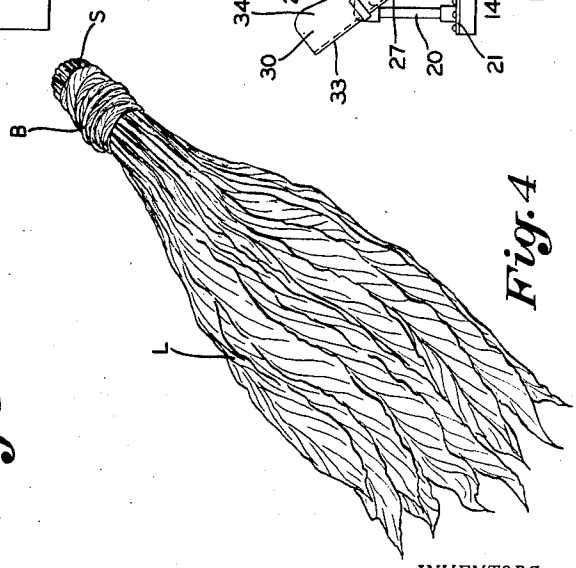


Fig. 4

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Feb. 5, 1957 S. BENNING ET AL 2,780,227

METHOD OF FORMING BUNDLES OF TOBACCO LEAVES

Original Filed July 16, 1953 2 Sheets-Sheet 2

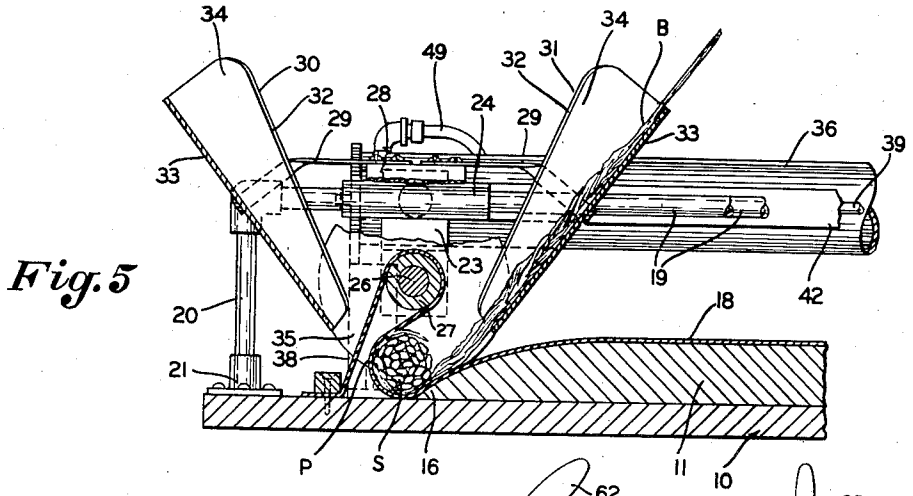


Fig. 5

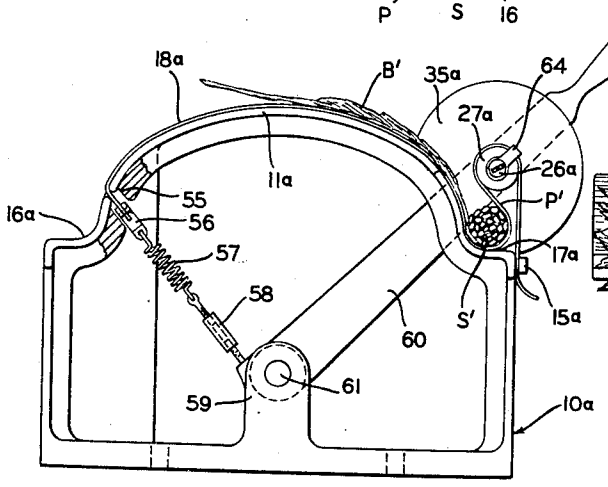


Fig. 6

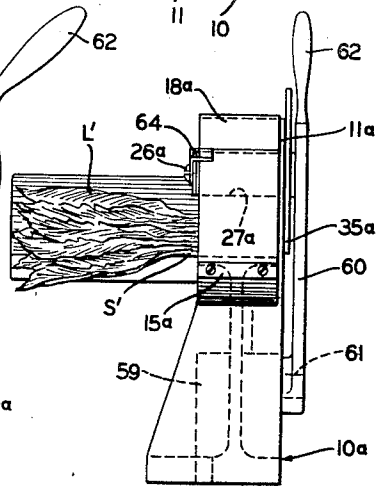


Fig. 7

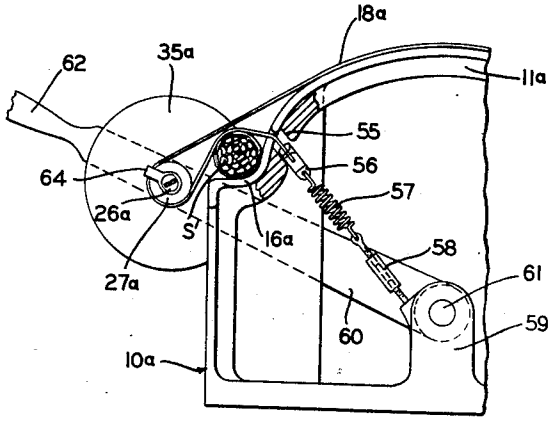


Fig. 8

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METHOD OF FORMING BUNDLES OF TOBACCO LEAVES

Samuel Benning and Louis E. Bacon, Alliance, Ohio

Original application July 16, 1953, Serial No. 368,430. Divided and this application July 22, 1954, Serial No. 444,986

6 Claims. (Cl. 131—149)

The invention relates to the forming of bundles, or "hands" as they are commonly known in the industry, of tobacco leaves by placing the desired number of leaves together and winding a leaf or other binding strip around the stems of the bundle, and this application is a division of our copending application Serial No. 368,430, filed July 16, 1953.

Tobacco leaves are customarily bound into bundles or "hands" by the tobacco planter and grower, and are ordinarily sold in this form. Heretofore, this binding of the tobacco leaves into bundles or "hands" has been performed by hand at a considerable cost in labor and time.

In carrying out this operation manually, the desired number of tobacco leaves to form a bundle are gathered together in a bunch, with the stems located parallel and coextensive with each other, and a binding leaf is then wound tightly around the stems of the bunch, producing a bundle or "hand" of tobacco leaves.

This is not only a tedious and time-consuming job, but becomes quite strenuous and tiring, as it involves considerable strain upon the hands and arms of the workman in holding the collected stems of the bunch of leaves tightly together with one hand and tightly winding the binding leaf around the stems with the other hand.

The present invention has for an object the provision of a novel method for the binding of tobacco leaves into "hands" or bundles.

Another object is to provide a method of bundling tobacco leaves which consists in rotating the collected stems of a bunch of tobacco leaves and simultaneously winding a binding leaf around the stems.

A further object is to provide such a method in which the stems of the bunch of leaves are rolled upon a surface while simultaneously winding the binding leaf around the stems.

A still further object is the provision of such a method of bundling leaves, in which the stems of a bunch of tobacco leaves are confined under pressure while they are rolled over a surface, and while the binding leaf is wound around the stems.

It is also an object of the invention to provide a method of the character referred to, which is performed upon mechanical means comprising an elongated surface with a flexible apron connected to opposite ends thereof and containing a certain amount of slack forming a pocket to receive the collected stems of a bunch of tobacco leaves, and a roller for compressing the stems and rolling them over the surface.

Another object is to perform the novel method upon such apparatus in which means is provided for maintaining the stems coextensive with each other during the rolling operation.

A further object is to provide for carrying out the method of bundling tobacco leaves upon such mechanical means in which the surface over which the leaves are rolled is provided with a recess at each end, the bunch of stems being placed in the pocket of the flexible apron, in one of said recesses, and rolled over the surface into the other recess.

A still further object of the invention is to provide for carrying out the method of bundling tobacco leaves by rolling them over an arcuate surface in the manner above referred to.

Furthermore, it is an object of the invention to perform the novel method of bundling tobacco leaves upon such mechanical means in which a stop disc is movable with the pressure roller for holding the stems of the bunch of leaves coextensive during the bundling operation.

And finally, it is an object of the invention to provide such a method of bundling leaves upon mechanical means including means for guiding a binding leaf around the stems as they are rolled.

The above objects together with others which will be apparent from the drawings and following description, or which may be later referred to, may be attained by carrying out the novel method of bundling tobacco leaves in the manner hereinafter described in detail, as by the apparatus illustrated in the accompanying drawings, in which;

Fig. 1 is a top plan view of apparatus by means of which the novel method of binding tobacco leaves into bundles may be carried out;

Fig. 2 a side elevation of the apparatus shown in Fig. 1;

Fig. 3 an end view of the apparatus shown in Figs. 1 and 2;

Fig. 4 a larger scale perspective view of a bundle or "hand" of tobacco leaves as formed by the method to which the invention pertains;

Fig. 5 an enlarged, fragmentary, longitudinal sectional view of one end portion of apparatus on which the method may be performed, showing the manner in which a binder leaf is wound around the stems of the bundle;

Fig. 6 is a front elevation of a modified form of apparatus upon which the method may be performed by rolling the stems of a bunch of leaves over an arcuate surface, showing the start of the bundling operation;

Fig. 7 is an end view of the apparatus shown in Fig. 6, showing a bunch of leaves in the process of being bundled thereon; and,

Fig. 8 is a fragmentary front elevation of the apparatus shown in Figs. 6 and 7, showing the completion of a bundling and binding operation embodying the invention.

Referring now more particularly to the embodiment of the invention as carried out on apparatus such as illustrated in Figs. 1 to 5 inclusive, in which similar numerals refer to similar parts throughout, an apparatus for performing the novel method of bundling leaves is shown comprising a base **10**, having a substantially flat, elongated bed **11** thereon, terminating in the downwardly inclined ends **12** and **13**, beyond which are mounted the stop members **14** and **15**, forming therebetween the transverse recesses **16** and **17** respectively.

A flexible apron **18**, of greater length than the bed **11**, is fixed at opposite ends to the base, beyond the ends of the bed **11**, as for instance to the stop blocks **14** and **15**, as best shown in Fig. 2. This apron extends longitudinally over the top of the bed **11** and the recesses **16** and **17**, and has considerable slack therein for a purpose to be later explained.

At one side of the bed **11**, and parallel therewith, is mounted a guide frame, which may be formed of pipe or rods as shown, and comprises the spaced, parallel, longitudinally disposed guide rods **19**, supported above the base **10** as by the corner posts **20** secured to the base as by the flange collars **21**. For the purpose of holding the

guide rods **19** rigidly in spaced relation, they may be connected together at opposite ends by the short pipe sections or rods **22**.

An H-shape cross head **23** is mounted for longitudinal sliding movement upon the guide rods **19**, as by the sleeve portions **24** of said cross head, and is provided with the bearing portion **25** within which is journalled the transversely disposed shaft **26**, extending transversely across the bed **11** and having the roller **27** mounted thereon.

A cross arm **28** is mounted upon the cross head **23**, at the side adjacent to the bed **11**, and supports the bracket arms **29**, which project in opposite directions therefrom to which are secured the downwardly inclined, converging guide troughs **30** and **31**.

These troughs are preferably of funnel shape as shown in the drawings and may have the longitudinal openings **32** along their opposed sides, and are for the purpose of guiding a binder leaf around the stems of a bunch of tobacco leaves being rolled upon the machine, as will be later described in detail.

As best seen in Fig. 2 the converging lower ends of the guide troughs **30** and **31** are disposed slightly below and on opposite sides of the roller **27** so as to guide the binder leaf onto the apron, substantially tangential to and around the bunch of stems.

Each of these funnels **30** and **31** has an arcuate bottom wall **33**, opposite side edges of which converge downwardly, and the opposed flanges **34** which extend toward each other to the longitudinal opening **32** form guide flanges by means of which a binder leaf passing downwardly into the smaller end of either funnel will be folded into a binding strip and directed tangentially to the stems of a bunch of tobacco leaves placed upon the apron **18**.

For the purpose of maintaining the ends of the stems of a bunch of leaves substantially coextensive during the binding and bundling operation, suitable stop means is provided adjacent the side of the bed toward the guide rods **19**. As shown in the drawings this stop may be in the form of a disc or plate **35** carried upon the shaft **26** of the roller directly adjacent to the inner edge of the apron **18**.

As in usual practice in a double acting cylinder, opposite ends of the cylinder **36** are provided with ports (not shown) which are connected through conduits **49** with a valve indicated generally at **50** by means of which fluid, from a suitable source of fluid pressure, may be alternately admitted to and exhausted from the opposite ends of the cylinder **36**.

With this arrangement it will be evident that by operating the control valve **50** the piston within the cylinder **36** may be reciprocated to move the roller **27** longitudinally above the bed **11** from either end thereof to the other.

In carrying out the novel method to form bundles or "hands" of tobacco leaves upon apparatus as shown in Figs. 1 to 5, the required number of leaves L are placed together in a bunch, with the stems S thereof held together in a bundle, as shown in Figs. 2, 4 and 5, and this bundle of stems is placed in the loop or pocket P of the apron located at either recess **16** or **17** at either end of the bed as shown in Figs. 2 and 5, with the ends of the stems butted against the stop **35**.

A binder leaf is then selected and fed, tip end forward, into the upper, open end of the trough or funnel on the side of the roller **27** adjacent to the bed **11**. As shown in Figs. 2 and 5, the roller is located at the left hand end of the bed with the bundle of leaf stems S inserted into the pocket of the apron between the roller and the recess **16** of the bed, and in that position of the parts the binder leaf indicated at B is inserted into the upper, open end of the trough or funnel **31** at the right side of the roller, as viewed in these figures.

In this position the valve **50** is operated to admit fluid to the left hand end of the cylinder **36**, as viewed in the drawings, and to exhaust fluid from the right hand end of the cylinder, thus moving the piston rod **44** to the right,

and through the link **42**, lug **46** and ears **48**, moving the cross head **23** to the right upon the guide rods **19**, and carrying with it the roller **27** toward the opposite end of the bed.

During this operation the binder leaf B is folded as it is passed down through the trough or funnel, the tip end thereof being advanced toward the apron, substantially tangential to the bundle of stems S, so that as the roller **27** advances toward the other end of the bed **11** this binding leaf will be wrapped around the stems S, and upon reaching the depression **17** at the opposite end of the table, the bundle or hand of tobacco leaves will be ejected from the apron into the recess **17** of the bed, and the stem end of the binder leaf B may be tucked into the spaces between the stems or leaves of the bundle in conventional manner, forming a bundle or hand of tobacco leaves as shown in Fig. 4.

The operation may be repeated by placing another bunch of leaves in the machine with the stems thereof located in the pocket of the apron formed between the roller and the recess **17**, and the cylinder **36** operated in reversed direction, moving the roller to the left, and at the same time, a binder leaf is inserted tip first into the left hand trough or funnel **30** and a bundle is formed and ejected from the machine at the left hand end thereof. It will be seen that throughout the operation the stop **35** or its equivalent will maintain the ends of the stems of the bunch of leaves substantially coextensive.

It will thus be seen that the binding or bundling of tobacco leaves into "hands" or bundles may be very quickly and easily performed, the only manual steps required being the insertion of a binder leaf into the trough at the beginning of each operation and the removal of the bound bundle or "hand" from the machine and tucking under of the end of the binder leaf stem at the completion of each operation.

Referring now to Figs. 6, 7 and 8, a modified form of apparatus for performing the invention is illustrated, in which the base of the machine is indicated generally at **10***a* and provided with an arcuate bed **11***a*, terminating at opposite ends in the recesses **16***a* and **17***a*.

The flexible apron **18***a*, which is of greater length than the bed, as described with reference to the embodiment of Figs. 1 to 5, may be fixed to the frame at one end, as indicated at **15***a*, and the other end may extend through a slot **55** in the bed, and has a connection **56** secured thereto for attachment to one end of a coil spring **57**, the other end of which is connected to one end of a turnbuckle **58** which is secured to the central lug **59** of the base. Thus the apron may be adjusted in length with any desired amount of tension thereon.

The roller **27***a* is journalled upon a shaft **26***a* carried by the lever **60** which is fulcrumed as at **61** upon the central lug **59** of the base and provided at its outer end with a hand grip portion **62** by means of which the lever may be manually operated to move the roller **27***a* in an arcuate path over the bed **11***a*, from one end thereof to the other, that is from the position shown in Fig. 6 to that shown in Fig. 8, and vice versa.

For the purpose of maintaining the ends of the leaf stems coextensive during the binding and bundling operation, a stop in the form of a disc **35***a* may be mounted upon the shaft **26***a* of the roller and adapted to move therewith adjacent to that side of the bed **11***a*.

This form of the machine is quite simple and the guide troughs or funnels may be dispensed with if desired, a binder leaf B′ being folded to narrow width and inserted tip end first into the loop or pocket P′ of the apron, within one of the recesses at the ends of the bed.

As shown in Fig. 6, the operation is started with the bundle of stems S′ of the leaves located in the loop or pocket of the apron positioned in the recess **17***a*, at the right hand end of the machine, and as the lever **62** is moved from that position to the position shown in Fig. 8, the binder leaf B′ will be tightly wound around the

stems S' of the bunch of leaves, and the bound bundle or "hand" of leaves will be ejected from the apron as the roller 27*a* reaches the position shown in Fig. 8. The bundle or "hand" of leaves thus formed is the same as that shown in Fig. 4.

In each form of apparatus for carrying out the invention, a clip 64 may be provided to hold the belt in line on the roller and to help hold the belt down upon the roller in better position to receive the bundle of leaves.

Moreover, the embodiments of the improved construction illustrated and described herein for carrying out the invention are by way of example, and the scope of the present invention is not limited to the exact details of construction.

Having now described the invention or discovery, the construction, the operation, and use of preferred embodiments thereof, and the advantageous new and useful results obtained thereby; the new and useful constructions, and reasonable mechanical equivalents thereof obvious to those skilled in the art, are set forth in the appended claims.

We claim:

1. The method of binding leaves of tobacco into a bundle, which consists in rotating the collected stems of a bunch of tobacco leaves and continuously rolling them forwardly in the direction of rotation while confining the stems only under pressure, simultaneously folding a binding leaf to form a binding strip and guiding the tip end of said binding leaf forwardly around the stems only, as they are being rolled forwardly, and winding the binding strip around the stems while they are being rolled forwardly.

2. The method of binding leaves of tobacco into a bundle, which consists in rotating the collected stems of a bunch of tobacco leaves and continuously rolling them forwardly in the direction of rotation while confining the stems only under pressure, maintaining the stems coextensive with each other during said forward rolling operation, simultaneously folding a binding leaf to form a binding strip and guiding the tip end of said binding leaf forwardly around the stems only, as they are being rolled forwardly, and winding the binding strip around the stems while they are being rolled forwardly.

3. The method of binding leaves of tobacco into a bundle, which consists in continuously rolling the collected stems of a bunch of tobacco leaves forwardly along a surface, while confining the stems only under pressure,

simultaneously folding a binding leaf to form a binding strip and guiding the tip end of said binding leaf forwardly around the stems only as they are being rolled forwardly, and winding the binding strip around the stems only, while they are being rolled forwardly.

4. The method of binding leaves of tobacco into a bundle, which consists in continuously rolling the collected stems of a bunch of tobacco leaves forwardly along a surface, while confining the stems only under pressure, maintaining the stems coextensive with each other during the rolling operation, simultaneously folding a binding leaf to form a binding strip and guiding the tip end of said binding leaf forwardly around the stems only as they are being rolled forwardly, and winding the binding strip around the stems only, while they are being rolled forwardly.

5. The method of binding leaves of tobacco into a bundle, which consists in rotating the collected stems of a bundle of tobacco leaves and continuously rolling them forwardly in a straight path in the direction of rotation while confining the stems only under pressure, simultaneously folding a binding leaf to form a binding strip and guiding the tip end of said binding leaf forwardly around the stems only, as they are being rolled forwardly, and winding the binding strip around the stems while they are being rolled forwardly.

6. The method of binding leaves of tobacco into a bundle, which consists in rotating the collected stems of a bunch of tobacco leaves and continuously rolling them forwardly in an arcuate path in the direction of rotation while confining the stems only under pressure, simultaneously folding a binding leaf to form a binding strip and guiding the tip end of said binding leaf forwardly around the stems only, as they are being rolled forwardly, and winding the binding strip around the stems while they are being rolled forwardly.

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