

Oct. 15, 1957

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2,809,641

APPARATUS FOR FORMING BUNDLES OF TOBACCO LEAVES

Filed July 16, 1953

2 Sheets-Sheet 1

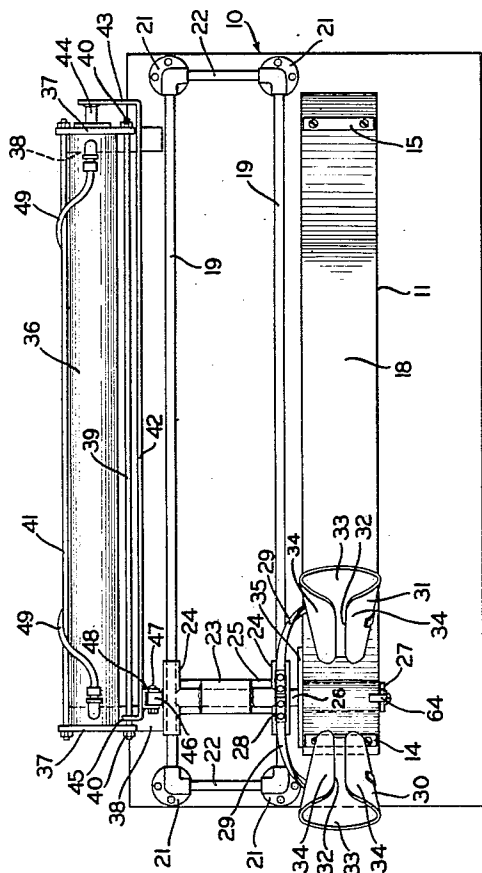


Fig. 1

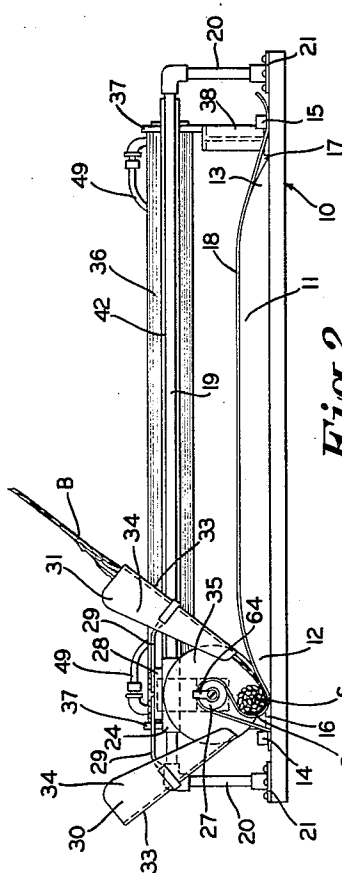


Fig. 2

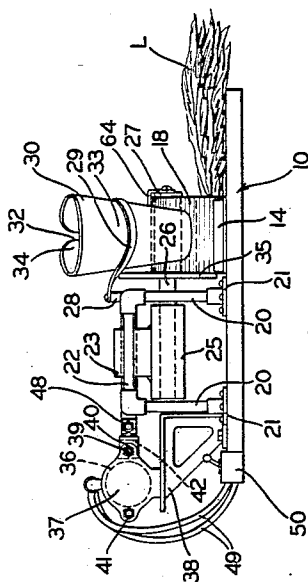


Fig. 3

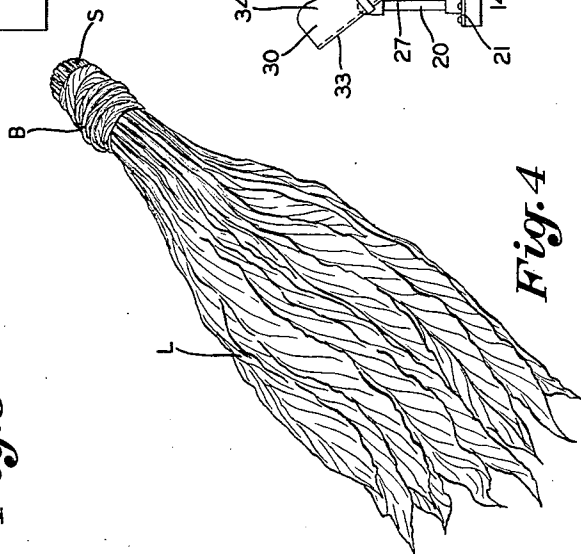


Fig. 4

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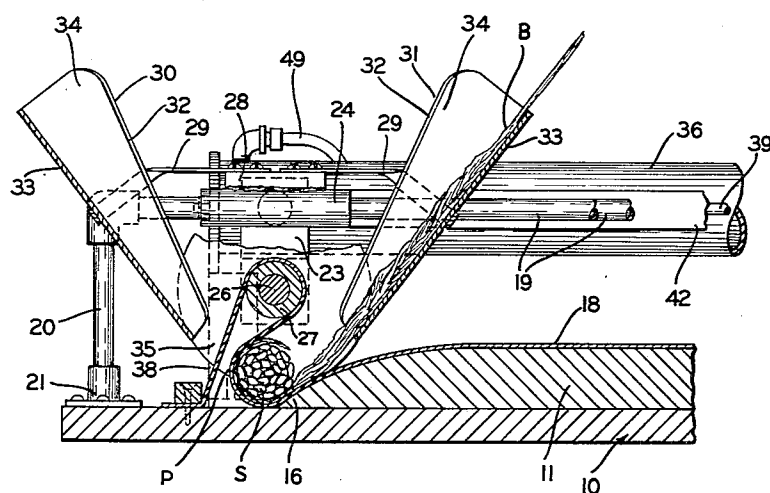
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2 Sheets-Sheet 2

Fig. 5



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APPARATUS FOR FORMING BUNDLES OF TOBACCO LEAVES

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Application July 16, 1953, Serial No. 368,430

4 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.

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 co-extensive 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 mechanical means for quickly, easily and efficiently bundling tobacco leaves into "hands," thereby not only greatly reducing the labor cost but also relieving the workers from physical discomfort and strain.

Another object is to provide for the bundling of tobacco leaves by rolling the collected stems of a bunch of tobacco leaves along a surface and simultaneously winding a binding leaf around the stems.

A further object is to provide apparatus for bundling tobacco leaves, comprising an elongated bed having a transverse recess at each end, a flexible apron connected at opposite ends to the bed, and a roller adapted to rotate on an axis movable longitudinally over the bed, the flexible belt having a certain amount of slack which is taken up by the roller, and leaves.

A still further object of the invention is to provide such a device in which the bed is of arcuate form and the roller is mounted to travel in an arcuate path over the bed.

It is also an object to provide such a device in which a trough or funnel is mounted to travel over the bed with the roller for guiding a binding leaf between the flexible apron and the stems of a bunch of tobacco leaves rolling along the bed.

Another object is to provide a device of the character referred to having stop means at one side of the bed for contacting the ends of the stems of the bunch of tobacco leaves to maintain them in substantially coextensive relation throughout the bundling and binding operation.

A further object is to provide power means for moving the roller longitudinally over the bed.

Still another object of the invention is to provide such an apparatus in which a fluid cylinder is mounted adjacent to the bed and operatively connected to the roller.

The above and other objects, apparent from the draw-

ings and following description, may be attained, the above described difficulties overcome and the advantages and results obtained, by the apparatus, construction, arrangement and combinations, sub-combinations and parts which comprise the present invention, a preferred embodiment of which, illustrative of the best mode in which applicant has contemplated applying the principle, being set forth in detail in the following description and illustrated in the accompanying drawings, in which:

Fig. 1 is a top plan view of an apparatus embodying the invention, for binding tobacco leaves into bundles or hands, showing fluid cylinder means for operating the same;

Fig. 2 is a side elevation of the machine shown in Fig. 1, showing the start of an operation of bundling a bunch of leaf tobacco;

Fig. 3 is an end view of the machine;

Fig. 4 is a larger scale perspective view of a bound bundle or "hand" of tobacco leaves as formed upon the machine; and

Fig. 5 is an enlarged, fragmentary, longitudinal sectional view of one end portion of the machine, showing the manner in which it winds a binder leaf around the stem of a bundle of leaves.

Referring now more particularly to the embodiment of the invention illustrated in Figs. 1 to 5 inclusive, in which similar numerals refer to similar parts throughout, an apparatus 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 journaled 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 down-

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wardly, 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 18.²

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.

However, for the purpose of increasing the speed and capacity of the machine, in order to more rapidly bind and bundle tobacco leaves, mechanical means are preferably provided for operating the cross head.

This means is shown as comprising a fluid cylinder 36, opposite heads 37 of which are attached to the supporting brackets 38 mounted upon opposite end portions of the base 10 on the side thereof away from the bed 11.

A guide rod 39, spaced from and parallel with the cylinder 36, is located between the cylinder and the adjacent guide rod 19 and may be attached at opposite ends to the heads 37 of the cylinder as indicated at 40, thus constituting one of the tie bolts which hold the heads upon the cylinder, the other tie bolt being shown at 41.

A longitudinally disposed link 42 is provided with a laterally extending arm 43 connected to the piston rod 44 of the cylinder, and the opposite end of the link has a laterally disposed arm 45 slidably mounted upon the guide rod 39. A lug 46 is formed upon the adjacent side of the cross head 23 and connected, as by the pin 47, with the ears 48 secured to the link 42 as by welding or the like.

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 operating the machine above described to form bundles or "hands" of tobacco leaves, 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

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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.

In each form of 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 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. Apparatus for binding tobacco leaves into bundles, comprising a bed having at each end a transversely disposed recess, a flexible apron of greater length than the bed extending longitudinally above the bed, means connecting opposite ends of the apron to opposite ends of the bed, a roller mounted to rotate above the bed and engaging the underside of the apron, and forming a transverse pocket therein, means for moving the roller longitudinally over the bed for carrying said pocket over the bed by said roller, a downwardly and rearwardly angled funnel movable with the roller for guiding a binding strip between the apron and the stems of a bunch of tobacco leaves in said pocket, and stop means adjacent one side of the bed for contacting the ends of the stems of a bunch of tobacco leaves rolled in said pocket and maintaining the stems coextensive with each other.

2. Apparatus for binding tobacco leaves into bundles, comprising a bed having at each end a transversely disposed recess, a flexible apron of greater length than the bed extending longitudinally above the bed, means connecting opposite ends of the apron to opposite ends of the bed, a roller mounted to rotate above the bed and engaging the underside of the apron, and forming a transverse pocket therein, means for moving the roller longitudinally over the bed for carrying said pocket over the bed by said roller, a downwardly and rearwardly angled funnel movable with the roller for guiding a binding strip between the apron and the stems of a bunch of tobacco leaves in said pocket, and a stop disc carried at one end

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of the roller adjacent one side of the bed for contacting the ends of the stems of a bunch of tobacco leaves rolled in said pocket, and maintaining the stems co-extensive with each other.

3. Apparatus for binding tobacco leaves into bundles, comprising a base, a bed upon the base having at each end a transversely disposed recess, a flexible apron of greater length than the bed extending longitudinally above the bed, means connecting opposite ends of the apron to opposite ends of the bed, a spaced pair of longitudinal guide rods parallel to and located at one side of the bed, a cross-head longitudinally slidable upon said guide rods, a fluid cylinder mounted upon the base parallel to the bed, a piston rod in the cylinder, a guide rod located parallel to the cylinder, a link connected at one end of the piston rod and at its other end to the cross-head and slidably connected to said last-named guide rod, a roller carried by said cross-head and engaging the underside of the apron and forcing a transverse pocket therein, said roller being movable longitudinally over the bed for carrying said pocket over the bed, means mounted to move with the roller above the apron for guiding a binding strip between the apron and the stems of a bunch of tobacco leaves in said pocket, and a stop disc carried at one end of the roller adjacent one side of the bed for contacting the ends of the stems of a bunch of tobacco leaves rolled in said pocket and maintaining the stems coextensive with each other.

4. Apparatus for binding tobacco leaves into bundles, comprising a base, a bed upon the base having at each end a transversely disposed recess, a flexible apron of greater length than the bed extending longitudinally above the bed, means connecting opposite ends of the apron to opposite ends of the bed, a spaced pair of longitudinal guide rods parallel to and located at one side of the bed, a cross-head longitudinally slidable upon said guide rods, a fluid cylinder mounted upon the base parallel to the bed, a piston rod in the cylinder, a guide rod located parallel to

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the cylinder, a link connected at one end to the piston rod and at its other end to the cross-head and slidably connected to said last-named guide rod, a roller carried by said cross head and engaging the underside of the apron and forming a transverse pocket therein, said roller being movable longitudinally over the bed for carrying said pocket over the bed, a downwardly and rearwardly inclined funnel mounted to move with the roller above the apron for guiding a binding strip between the apron and the stems of a bunch of tobacco leaves in said pocket, and a stop disc carried at one end of the roller adjacent one side of the bed for contacting the ends of the stems of a bunch of tobacco leaves rolled in said pocket and maintaining the stems coextensive with each other.

References Cited in the file of this patent

UNITED STATES PATENTS

77,010	Delinger	Apr. 21, 1868
103,862	Fowler	June 7, 1870
172,120	Hennaman	Jan. 11, 1876
211,548	Block	Jan. 21, 1879
409,785	Greensfelder	Aug. 27, 1889
444,768	Rickards	Jan. 13, 1891
674,148	Wisburn	May 14, 1901
704,742	Gardner	July 15, 1902
707,742	Weierbach	Aug. 26, 1902
1,133,847	Fearon	Mar. 30, 1915
2,048,042	Wedge	July 21, 1936
2,198,913	Grounds	Apr. 30, 1940
2,199,114	Rosenberg	Apr. 30, 1940
2,271,632	Diehl	Feb. 3, 1942
2,406,675	Gallup	Aug. 27, 1946
2,667,173	Wheeler	Jan. 26, 1954

FOREIGN PATENTS

445,076	France	Aug. 24, 1912
578,139	France	June 24, 1924