

Sept. 2, 1952

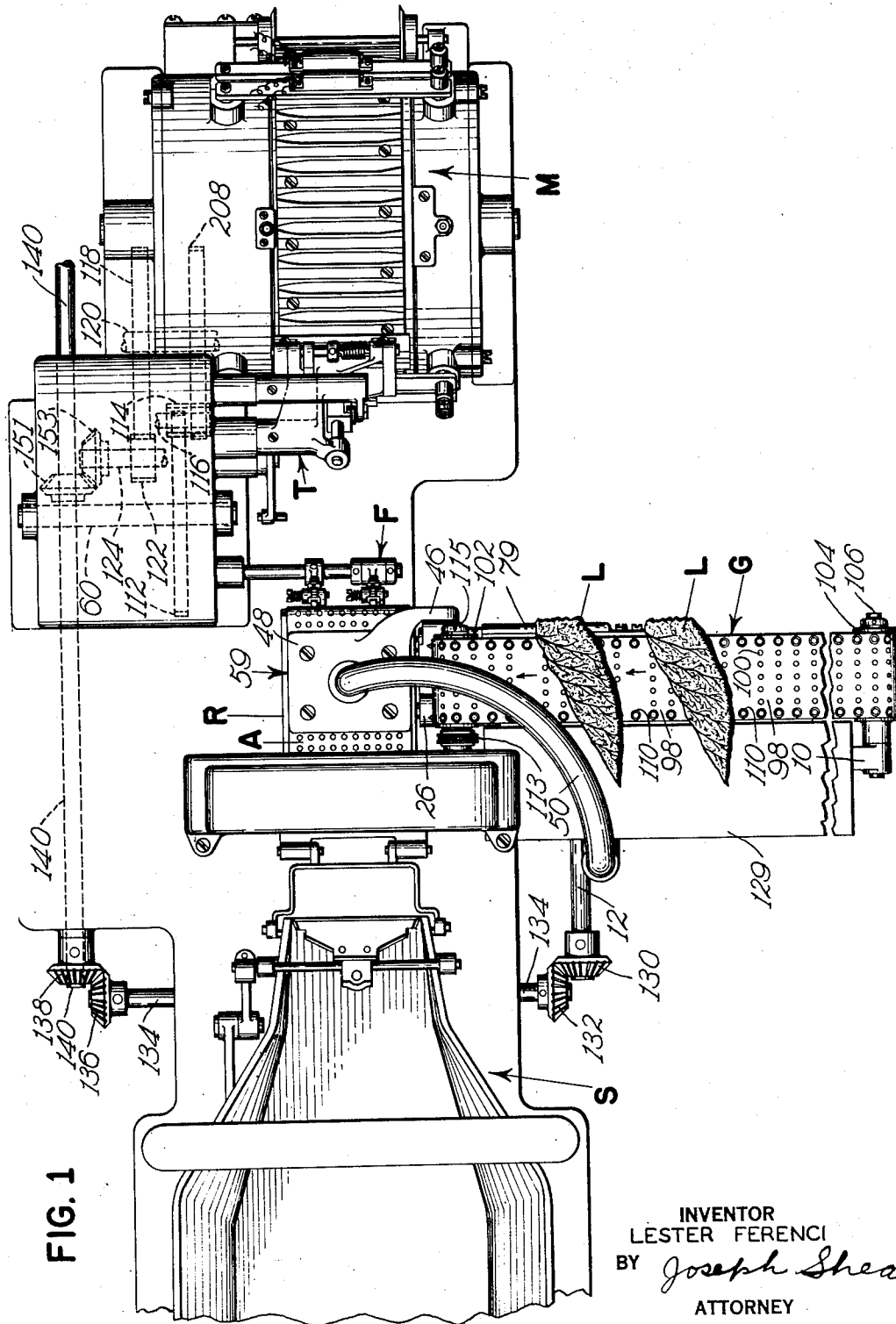
L. FERENCI

2,608,974

CIGARILLO MACHINE

Filed May 29, 1946

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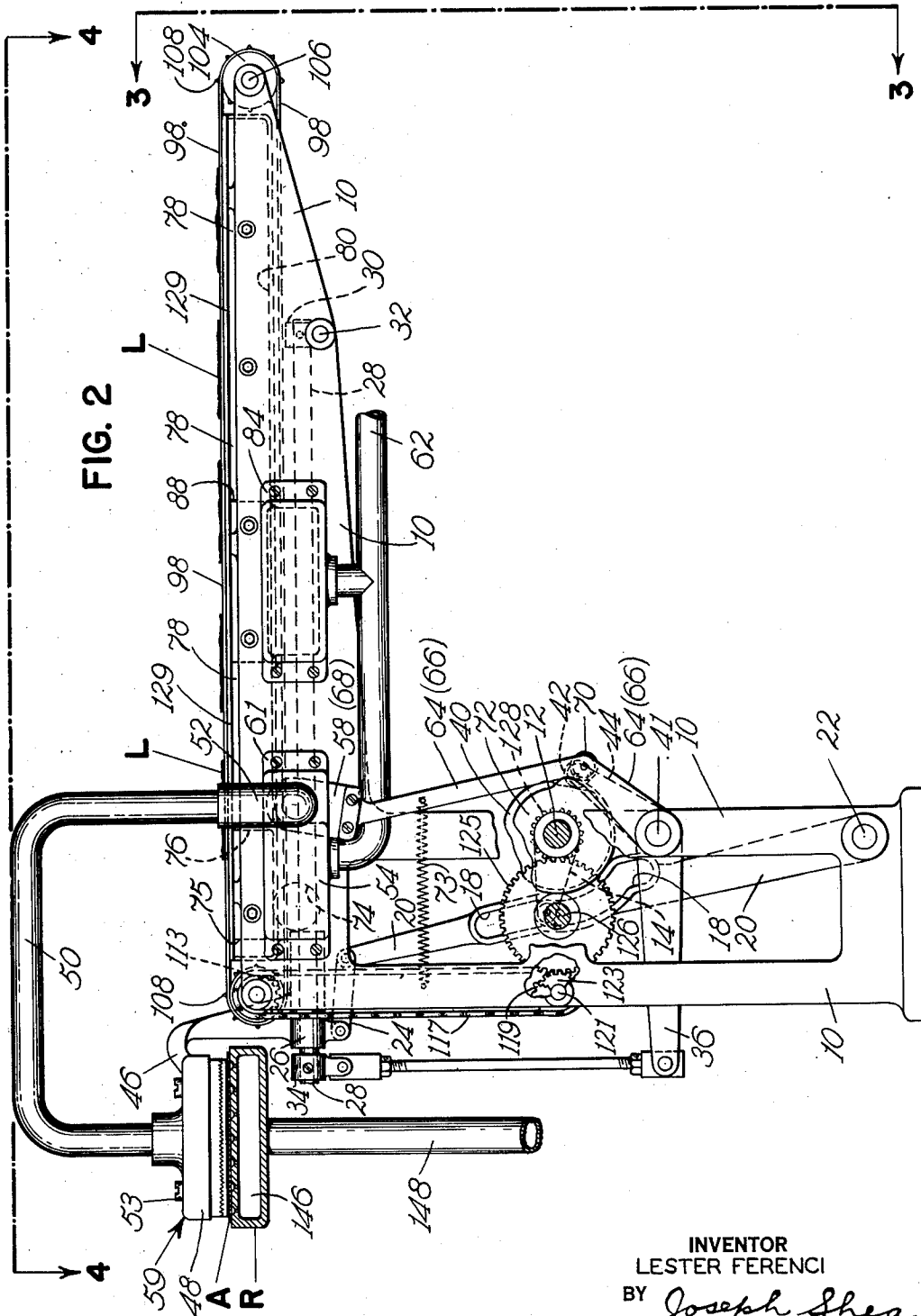
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INVENTOR  
LESTER FERENCI  
BY *Joseph Shea*  
ATTORNEY

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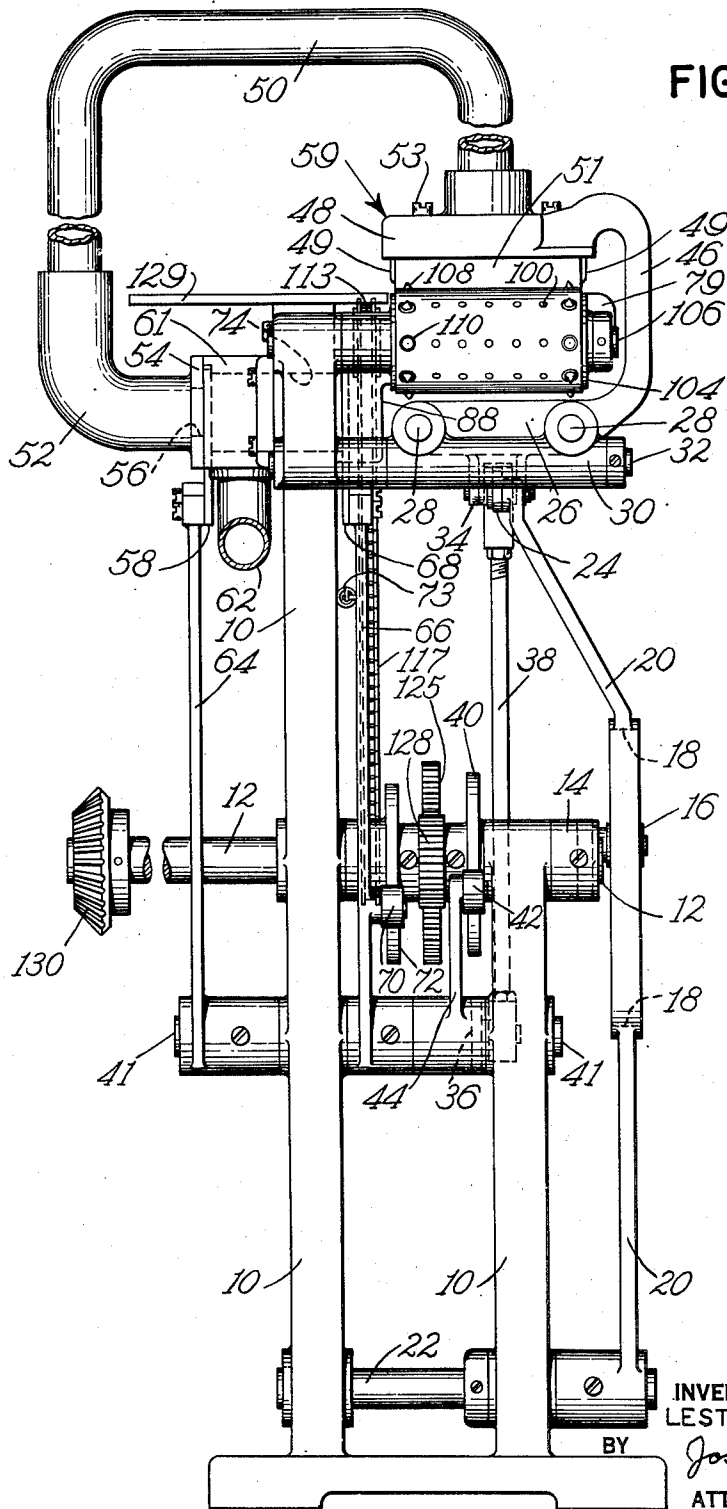


FIG. 3

INVENTOR  
LESTER FERENCI  
BY *Joseph Shea*  
ATTORNEY

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L. FERENCI

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## UNITED STATES PATENT OFFICE

2,608,974

## CIGARILLO MACHINE

Lester Ferenci, Indianapolis, Ind., assignor to  
International Cigar Machinery Company, a cor-  
poration of New Jersey

Application May 29, 1946, Serial No. 673,106

9 Claims. (Cl. 131—33)

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This invention relates to cigar machines, more particularly to binder feeds for scrap cigar bunch machines.

One of the main objects of this invention is to provide a binder feed on which a plurality of binder tobacco leaves may be manually placed to be advanced into a position adjacent the bunch rolling table of the scrap cigar bunch machine and then transferred to the bunch rolling apron of the bunch rolling table. Thus when a number of binder tobacco leaves are placed on the binder feed they will be delivered automatically to the bunch rolling apron to be wrapped about cigar bunch charges for the formation of cigar bunches. Prior to my invention the binders were manually placed on the bunch rolling apron of the scrap bunch machine after being cut to the proper length from binder tobacco leaves. A further object of my invention is to automatically trim the ends of the binder tobacco leaves to provide a binder of the proper length.

Still another object of the invention is to advance the binder tobacco leaves continuously into position to be transferred to the bunch rolling apron in order to permit formation of cigar bunches at a greater rate of production.

A further object of the invention is to provide a reserve supply of binder leaf tobacco sections, while advancing the same into position to be transferred to the bunch rolling apron, by advancing a series of leaf sections simultaneously. Accordingly the attendant does not have to wait until the binder transfer is transferring a binder to the bunch rolling apron to lay the next binder leaf section in position to be transferred in the next cycle of operations by the binder transfer. Instead the operator may lay the binder leaf tobacco sections independently of the operation of the binder transfer. If delayed in laying one leaf section this will not require the operation of the bunch rolling apron and the rest of the cigar machine to be delayed, as there will be a reserve supply of leaf sections in the series being advanced into position for delivery to the bunch rolling apron.

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

In the accompanying drawings which form a part of this specification:

Fig. 1 is a plan view of a scrap cigar bunch machine equipped with my novel automatic binder feed;

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Fig. 2 is a side elevation of my automatic binder feed;

Fig. 3 is an end elevation of the automatic binder feed from line 3—3 of Fig. 2;

Fig. 4 is a plan view of same with certain parts broken away, viewed from line 4—4 of Fig. 2;

Fig. 5 is a sectional view of the binder transfer at binder-receiving position and the adjoining portion of the binder feed taken on line 5—5 of Fig. 4; and

Figs. 6 and 7 are partial side elevations of the binder feed and binder transfer illustrating the successive positions of the binder transfer during the cutting and transferring operations.

The automatic binder feed is supported by a frame 10 (Figs. 2 and 3). The binder feed has a drive shaft 12 which is suitably driven from the scrap cigar bunch machine in properly timed relationship, as will be hereinafter described. A crank 14 secured on one end of shaft 12 carries a roller 16 which engages a cam slot 18 in a lever 20. The lower end of lever 20 is fulcrumed on a shaft 22 supported by suitable bearings of frame 10.

A link 24 is pivotally connected to the upper end of lever 20 and a lug on a reciprocating member 26 slidably mounted on rods or guides 28. One end of the guides 28 is secured in a bracket 30 loosely mounted on a stub shaft 32 secured in frame 10 (Fig. 2). At their other ends the guides 28 are secured in a bracket 34 which is intermittently raised and lowered by an arm 36 of a cam lever 44 mounted on shaft 41, an adjustable connecting rod 38 being pivotally connected to bracket 34 and arm 36.

Secured to shaft 12 is a cam 40 whose periphery engages a cam roller 42 mounted on the cam lever 44 which is loosely mounted on shaft 41 supported in bearings in frame 10. On the hub of lever 44 is formed the lifter arm 36 whose outer end is pivotally connected to the connecting rod 38. The shape of cam 40 is such that it imparts to bracket 34 an intermittent upward and downward motion at the desired time, and thereby raises and lowers the member 26 while it is being reciprocated on guides 28.

Integral with and extending upwardly from one side of reciprocating member 26, is an arm 46 on whose outer end is formed a hollow binder transfer head 48 which is connected by a flexible conduit or hose 50 to a source of suction which will be hereinafter described. A hollow suction head 51 (Fig. 5) is slidably mounted inside of transfer head 48 and supported from head 48 by screws 53. Springs 55 on screws 53 urge head

51 downwardly and permit it to be moved upwardly into head 48. The suction head 51 and transfer head 48 constitute a binder transfer 59 having a suction chamber. The bottom of suction head 51 is provided with suitable suction holes 57, which permit binder material to adhere to the bottom of said head when suction is to be applied to the suction chamber in the binder transfer 59.

Secured to the inner faces of both sides of the transfer head 48 and extending downwardly beyond the lower edge thereof are two knives 49 whose inner faces slide against the outer faces of the side walls of the suction head 51 as shown in Fig. 5. Knives 49 are provided with serrated cutting edges.

The flexible conduit 50 may be formed of any suitable material such as rubber, woven metal, or covered fabric, and connects the suction chamber of the binder transfer 59 to a hollow elbow 52 extending upwardly from the cover 54 of a suction box 61 attached to frame 10. Suction is maintained in suction box 61 continuously through a connection pipe 62 leading to any suitable source of suction (not shown). A port 56 (Fig. 5) in cover 54 opens into elbow 52. This port 56 in conjunction with an oscillating suction control valve 58, which extends upwardly through a slot in the bottom of suction box 61 into a position overlying port 56, permits the suction in suction box 61 to be applied to or shut off from the suction chamber of binder transfer 59.

Suction control valve 58 is fastened to a control arm 64 secured to shaft 41 (Fig. 3.) Also fastened on shaft 41 is another valve control arm 66, also shown in Fig. 3, similar to arm 64, which has secured at its upper end a suction control valve 68, similar to suction control valve 58. A cam roller 70 on arm 66 contacts the periphery of a valve control cam 72 secured to shaft 12. In order to maintain cam roller 70 against cam 72 a suitable tension spring 73 is connected to arm 66. Cam 70 through the linkage just described, imparts to both suction control valves 58 and 68 a simultaneous oscillatory motion.

The automatic binder feed is also provided with a hollow table 78 secured to frame 10 and provided with a delivery suction chamber 76 and a feed suction chamber 80 (Fig. 4). Frame 10 is provided with a duct 74 communicating with suction box 61 and also communicating through a duct 75 with the suction chamber 76. The duct 75 is formed in a boss 77 of the table 78. Duct 74 is normally closed by the control valve 68 which permits the suction in suction box 61 to be applied to or cut off from the suction chamber 76 of the table 78.

As previously noted, table 78 is provided with two hollow suction chambers, the chamber 76 and the suction chamber 80. The latter by means of duct 86 in a boss 88 protruding from the side of chamber 80, and a passage 90 in frame 10, is connected to a suction box 84 secured to frame 10. This suction box is directly connected to pipe 62 through a suitable connection as shown in Fig. 2.

The table 78 is provided with a top 92 having suitable suction holes 94 located in the bottom of longitudinal grooves 96 formed in the outer face of the top 92. The table top 92 supports the upper run of a continuously moving belt 98 that is perforated with suction holes 100 properly spaced to coincide with grooves 96 and arranged in a series of transverse rows 100a, 100b, 100c, 100d and 100e (Fig. 4). Each series of trans-

verse rows of suction holes 100a, 100b, 100c, 100d and 100e provides a perforated section of belt 98 on which a binder tobacco leaf may be positioned. Thus when suction is applied to the suction chambers 76 and 80, binder leaf tobacco placed on the upper run of belt 98 will suctionally adhere to the portions of these belts overlying chambers 76 and 80. Belt 98 is positively driven by a driving pulley 102 and is supported by idler pulley 104 on shaft 106 held by frame 10. Cogs 108 mounted on the peripheries of pulleys 102 and 104 engage properly spaced eyelets 110 in belt 98 to prevent slippage thereof and to assure a properly timed relationship of belt 98 relative to the cigar machine. Driving pulley 102 and a sprocket 113 secured thereto are both loosely mounted on a shaft 115 held by frame 10. Sprocket 113 through a chain 117 is driven by a sprocket 119 (Fig. 2) secured to a shaft 121 supported in bearings of frame 10. Also mounted on shaft 121 is a gear 123, Fig. 2, meshing with a gear 125 which is secured to a shaft 126 supported in bearings of frame 10, gear 125 being driven by a gear 128 (Figs. 2 and 3) fastened to the drive shaft 12 of the automatic binder feed.

The automatic binder feed, which is generally designated by the letter G in Fig. 1, is employed for the purpose of continuously forwarding binder leaf tobacco to a cigar bunch rolling machine designated generally by the letter S, as shown in Fig. 1.

In the operation of the binder feed, an operator places tobacco leaves L, Fig. 1, in properly spaced position on the perforated sections of the continuously moving belt 98. The leaves L adhere to the belt, due to suction supplied to the outer surface of same through holes 100, and are carried forward in the direction of the arrows shown in Fig. 1. A supporting table 129, on which the ends of leaves L projecting over the edge of said belt may rest, is fastened to the top of frame 10. The perforated sections of the belt 98, and therefore the tobacco so placed upon these sections, are so arranged as to assure a properly timed pick up by the reciprocating binder transfer 59 at the end of the upper run of belt 98.

During its reciprocating motion the binder transfer 59 has to be raised and lowered, which is accomplished through the action of cam 40 upon the linkage connected to the bracket 34. The reciprocating motion of binder transfer 59 is obtained by the rotation of crank 14 whose roller 16 engages cam slot 18 of lever 20.

After a binder blank B (Fig. 7) has been delivered to the bunch rolling apron A of rolling table R (Fig. 1) of scrap bunch machine S, the binder transfer 59 is lifted in the manner previously described and is returned to its initial position above conveyor 98. The binder transfer 59 then descends and engages a binder leaf L on conveyor 98 and then travels a short distance with the conveyor at the same speed as the conveyor. While transfer 59 moves downward the suction head 57 is pressed against the binder leaf L while the knives 49 trim its ends. The trimmed binder adheres to suction head 57 and is lifted off said conveyor and transferred on to the rolling apron A of rolling table R of scrap bunch machine S as shown in Figure 1. It may be noted that the vertical and horizontal movements of the binder transfer just described occur more or less simultaneously and the motion of the binder transfer is in reality a forward swooping one. That is the head 48 moves backwards, then starts moving forward, and while moving forward moves

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downward. While traveling forward at the same speed as the conveyor belt, head 48 moves down and knives 49 cut off the ends of the binder leaf. Then, while the binder transfer is still moving forward, the suction head 51 picks up the trimmed binder and continues its motion as shown in Figs. 6 and 7.

A more detailed description of the operation of the automatic binder feed follows:

When the drive shaft 12 of the automatic binder feed is driven, transfer head 48 is lifted off the bunch rolling apron A, whereon it has just deposited a trimmed binder, as shown in Figs. 1, 2 and 4. Head 48 is then moved backwards over the conveyor belt 98. At the same time conveyor belt 98 is continuously advanced to move binder tobacco leaves into a predetermined pick-up position.

As the binder transfer head 48 reaches its rear-most position, it is above the foremost tobacco leaf L and starts forward again, moving at the same speed as conveyor 98. At the same time the head 48 is lowered until suction head 51 contacts the underlying binder leaf L. While still moving forward the head 48 continues to move downwards, and knives 49 are thereby lowered sufficiently to cut the binder leaf L to the desired length as shown in Fig. 6. To assure a cleaner cut and prevent the bending of leaves L during cutting, the overhanging portions of leaves L are supported by one edge of table 129 and a guide member 79 secured to the side of table 78. The lateral edges of the table top 92 serve as ledger plates for knives 49.

From the moment transfer head 48 started moving backwards suction control valve 58, which is actuated by means previously described, has been in front of port 56. Therefore there is no suction in the suction chamber of the binder transfer 59 during its backward movement. Therefore the binder remains on the rolling apron R while the binder transfer returns to its initial position. However suction has been maintained in the chamber 76 of table 78. Immediately after knives 49 have trimmed the binder leaf L, suction control valve 58 moves away from port 56 to allow suction to be applied to the suction chamber of binder transfer 59. At the same time suction control valve 68 moves to the position shown in Fig. 6 in front of duct 74 thereby shutting off the suction in delivery chamber 76 of table 78. At this stage the transfer head 48 is almost directly above delivery chamber 76, Fig. 6. The binder leaf L, after being cut to desired length to form a binder B, adheres to the bottom of suction head 51, Fig. 7.

The transfer head 48 is now raised and suction control valves 58 and 68 assume the position shown in Fig. 7, so that suction is on both in the binder transfer 59, to hold the leaf to the suction head 51 during transfer operation, and in delivery chamber 76 to suctionally hold the binder leaf L as it is advanced above chamber 76 on conveyor belt 98. The binder leaves are also suctionally held on belt 98 while above the suction chamber 80 in which suction is maintained continuously.

The knives 49 may be omitted if precut binders of the correct or approximately cut size are placed on conveyor belt 98 by the operator. The pieces of binder leaf left on table 129 after cutting may be combined to form binders.

The binder transfer after picking up a binder moves at a faster rate towards the rolling table R of scrap bunch machine S. As the binder transfer reaches a position above said table it

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descends and the binder B held on suction head 51 comes in contact with the bunch rolling apron A of the bunch rolling table R. Table R is provided with a suction chamber 146 in which suction is maintained continuously through a suitable pipe 148 that is connected to the same source of suction, not shown, as the automatic binder feed.

Shortly after the binder is deposited on apron A, valve plate 58 moves in front of port 56 and the suction in binder transfer 59 is shut off, thereby causing the binder blank to adhere to apron A. The transfer head 48 then ascends and returns to pick up another binder.

The bunch rolling table R is a portion of a suitable scrap bunch machine such as disclosed in the Durning Patent No. 2,306,381, issued December 29, 1942.

In order to assure properly timed relationship between the scrap bunch machine S and the automatic binder feed G, the drive shaft 12 of the automatic binder feed is provided with a bevel gear 130 secured to one end thereof and driven by a bevel gear 132 fastened to the main drive shaft 134 of the scrap bunch machine S (Fig. 1). Mounted on the opposite end of shaft 134 is a bevel gear 136 driven by a bevel gear 138 secured to shaft 140 which is the main drive shaft of a cigar rolling machine (not shown), which may be any suitable construction. These drives are shown in Fig. 1.

In connection with scrap bunch machine S there is provided a bunch transfer mechanism T (Fig. 1) such as disclosed in the co-pending application of J. F. Halstead, S. N. 452,001, filed July 23, 1942, for Cigarillo Machine. The cigar bunch is delivered from the bunch rolling table R to bunch transfer fingers F (Fig. 1) which carry the bunch to a position wherein it is gripped by the transfer mechanism T and deposited in a bunch shaping mechanism M also shown in Fig. 1. Since the construction of the mechanisms F, T and M is fully disclosed in said Halstead application, a detailed description thereof is deemed unnecessary.

Since these mechanisms have to operate in properly timed relationship to the bunch machine S and the cigar rolling machine they may be driven in the following manner. As shown in Fig. 1, the main drive shaft 140 of the cigar rolling machine has secured thereon a bevel gear 151 which drives a bevel gear 153 fastened to a shaft 124 on which is mounted a pinion 122 which drives a gear 118 secured to shaft 120. Also mounted on shaft 120 is a gear 208 which drives a pinion 114 fastened to shaft 116. The pinion 114 drives a gear 112 secured to shaft 60 which is the drive shaft for the bunch transfer device T.

Gear 208 drives a gear (not shown) corresponding to the gear 206 shown in said Halstead application and thereby drives an indexing mechanism, also not shown but illustrated and described in detail in said Halstead application whereby, the mold turret of the bunch shaping mechanism M is intermittently driven. In the accompanying drawings, the reference characters A, F, R, T, M, 60, 112 to 124 inclusive, and 208 correspond to similarly numbered parts of said Halstead application.

Preferably, paste is applied to a portion of the binder deposited on the bunch rolling apron A by mechanism such as shown in the Clausen Patent 2,391,294. The paste so applied to the binder



will hold it in position on the bunch charge about which it is wrapped.

The apparatus described herein may be used to manufacture cigar bunches for cigarillos or scrap bunch cigars. If cigarillos are to be made the paste will be applied to the binder on the rolling apron A by a binder paster (not shown) to hold the same together after it is wrapped around the bunch charge to form the cigar bunch. When making scrap bunch cigars, the pasting of the binder may be omitted and the transfer T will hold the binder in place while transferring the cigar bunch to the mold turret M.

What is claimed is:

1. In a cigar machine having a bunch rolling apron, the combination with an endless flexible conveyor having spaced sections adapted to retain binder leaf tobacco thereon for simultaneously forwarding a series of binder tobacco leaf sections transversely of the leaf sections to advance successive leaf sections on said spaced sections of the conveyor to a predetermined position, of a device at said predetermined position for trimming the ends only of the leaf sections advanced by said conveyor to form binders of a predetermined length, and mechanism for transferring said binders to the bunch rolling apron to be wrapped about cigar bunch charges by the apron for the formation of cigar bunches.
2. In a cigar machine having a bunch rolling apron, the combination with a continuously moving endless flexible conveyor having spaced sections adapted to retain binder leaf tobacco thereon for advancing simultaneously a series of binder tobacco leaf sections to move the leaf sections on the spaced sections of the conveyor continuously to a predetermined position adjacent the bunch rolling apron, of means for transferring a binder tobacco leaf section from said predetermined position to the rolling apron to be wrapped about a bunch charge by the apron for the formation of a cigar bunch.
3. In a cigar machine having a bunch rolling apron, the combination with mechanism for advancing simultaneously a series of binder tobacco leaf sections to move the leaf sections successively to a predetermined position adjacent the bunch rolling apron, of means for transferring a binder tobacco leaf section from said predetermined position to the rolling apron to be wrapped about a bunch charge by the rolling apron for the formation of a cigar bunch, said mechanism including a continuously moving endless perforated apron and a device for suctionally holding binder tobacco leaf sections on said perforated apron until they are advanced to a predetermined pick-up position, and said binder transferring means including a binder transfer adapted to pick up a binder tobacco leaf section at said pick-up position and transfer the same to the bunch rolling apron.
4. In a cigar machine having a bunch rolling table, the combination with an endless flexible conveyor having spaced sections adapted to retain binder leaf tobacco thereon for continuously advancing binder leaf tobacco sections on said conveyor sections to a predetermined position, of means for continuously driving said conveyor and a device for transferring binder tobacco leaf sections from said predetermined position to the bunch rolling table.
5. In a cigar machine, the combination with an endless continuously traveling perforated apron having an upper run adapted to advance

binder tobacco leaf sections to a predetermined pick-up position, of a primary suction chamber having a perforated portion underlying a portion of the upper run of said apron to cause suctional adhesion of binder leaf tobacco sections to the overlying portion of said apron, means for continuously maintaining suction in said primary suction chamber, a secondary suction chamber having a perforated portion underlying the portion of said apron at said pick-up position to suctionally hold a binder tobacco leaf upon said apron at pick-up position, a transfer mechanism including a suction chamber adapted to pick up said leaf at said pick-up position, and a device for cutting off suction in said secondary suction chamber and applying suction to said suction chamber of the transfer mechanism to permit a binder tobacco leaf section at said pick-up position to be picked up by said transfer mechanism.

6. In a cigar machine having a bunch rolling table, the combination with an endless traveling perforated apron having an upper run adapted to advance binder tobacco leaves to a predetermined pick-up position, of a suction chamber having a perforated portion underlying the pick-up position of the binder tobacco leaf sections on said apron to suctionally hold a leaf section at said pick-up position, a device for intermittently cutting off suction in said chamber to permit removal of the leaf section at pick-up position, and a binder transfer adapted to remove a binder tobacco leaf section from said pick-up position while suction is cut off in said chamber and transfer it to the bunch rolling table, said binder transfer being provided with knives adapted to trim off the ends of a binder tobacco leaf section at said pick-up position to form a binder of predetermined length.

7. In a cigar machine having a bunch rolling table, the combination with a continuously traveling endless perforated apron having a run adapted to advance binder tobacco leaf sections to a predetermined pick-up position, of a suction chamber having a perforated portion adjacent the pick-up position of the binder tobacco leaves on said apron to suctionally hold a binder tobacco leaf section at said pick-up position, a device for intermittently cutting off suction in said chamber to permit removal of the binder tobacco leaf at said pick-up position, and a binder transfer provided with a perforated bottom adapted to pick up and transfer a binder tobacco leaf section from said pick-up position to the bunch rolling table, and mechanism for moving said binder transfer into engagement with the leaf section at pick-up position while simultaneously moving said binder transfer along with and at the same speed as said apron, and devices for applying suction to said binder transfer while it engages the binder tobacco leaf and cutting off the suction from said chamber to permit the leaf section to adhere to and be picked up on the bottom of the binder transfer.

8. In a cigar machine having a bunch rolling apron, the combination with mechanism for advancing a series of binder tobacco leaf sections including a continuously moving endless conveyor belt arranged to support a plurality of said leaf sections in outspread condition, of means for transferring leaf sections one at a time from a delivery position on said conveyor belt while it is in motion to said bunch rolling apron for rolling a bunch charge therein.

9. In a cigar machine having a bunch rolling

apron, the combination with mechanism for advancing a series of binder tobacco leaf sections including a continuously moving endless conveyor belt arranged to support a plurality of said leaf sections in outspread condition, of means for transferring leaf sections one at a time from a delivery position on said conveyor belt while it is in motion to said bunch rolling apron for rolling a bunch charge therein, said conveyor belt having spaced binder receiving portions for receiving binders in predetermined position to register the binders with said transfer means at said delivery position.

LESTER FERENCI.

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