Feb. 18, 1947. J. F. HALSTEAD 2,416,173

LEAF SEPARATOR

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FIG. 1

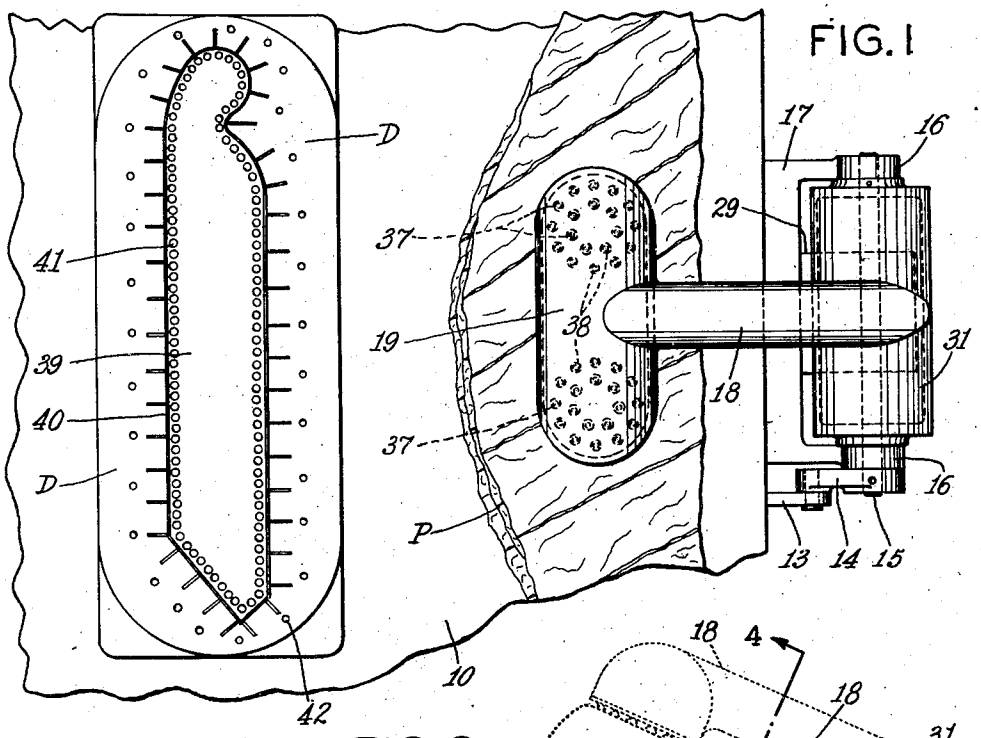
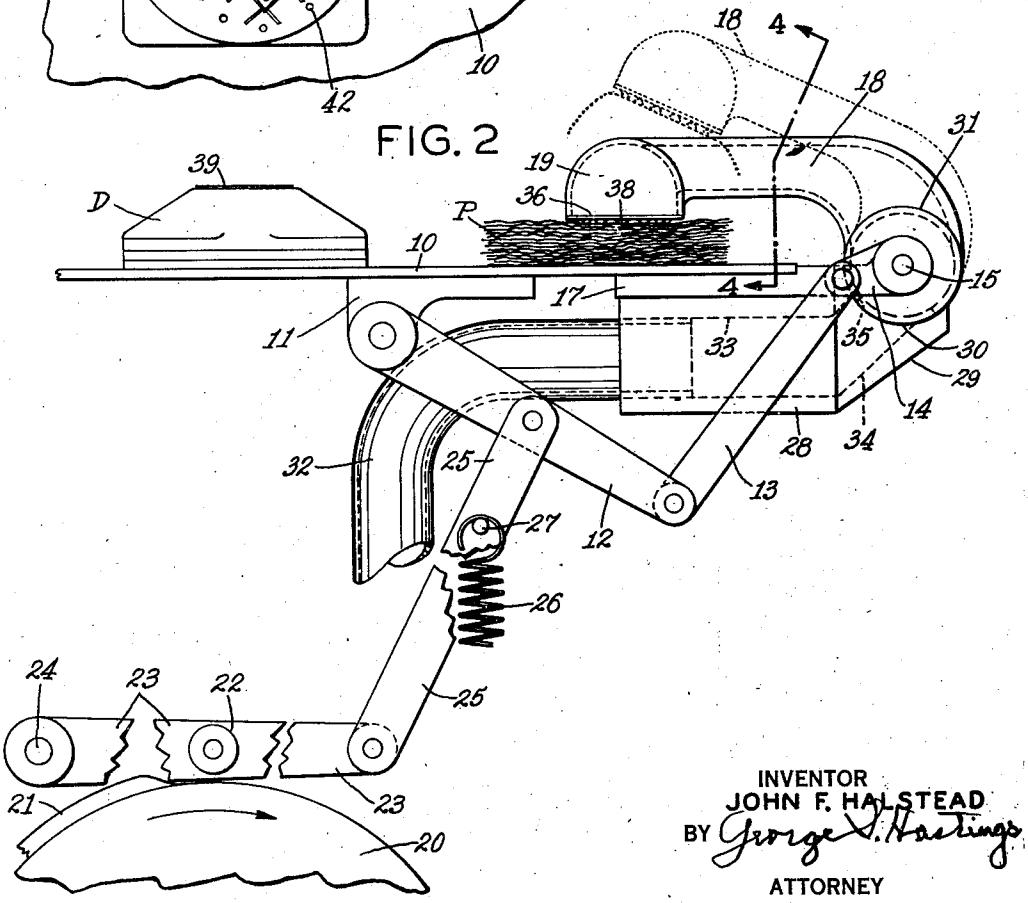


FIG. 2



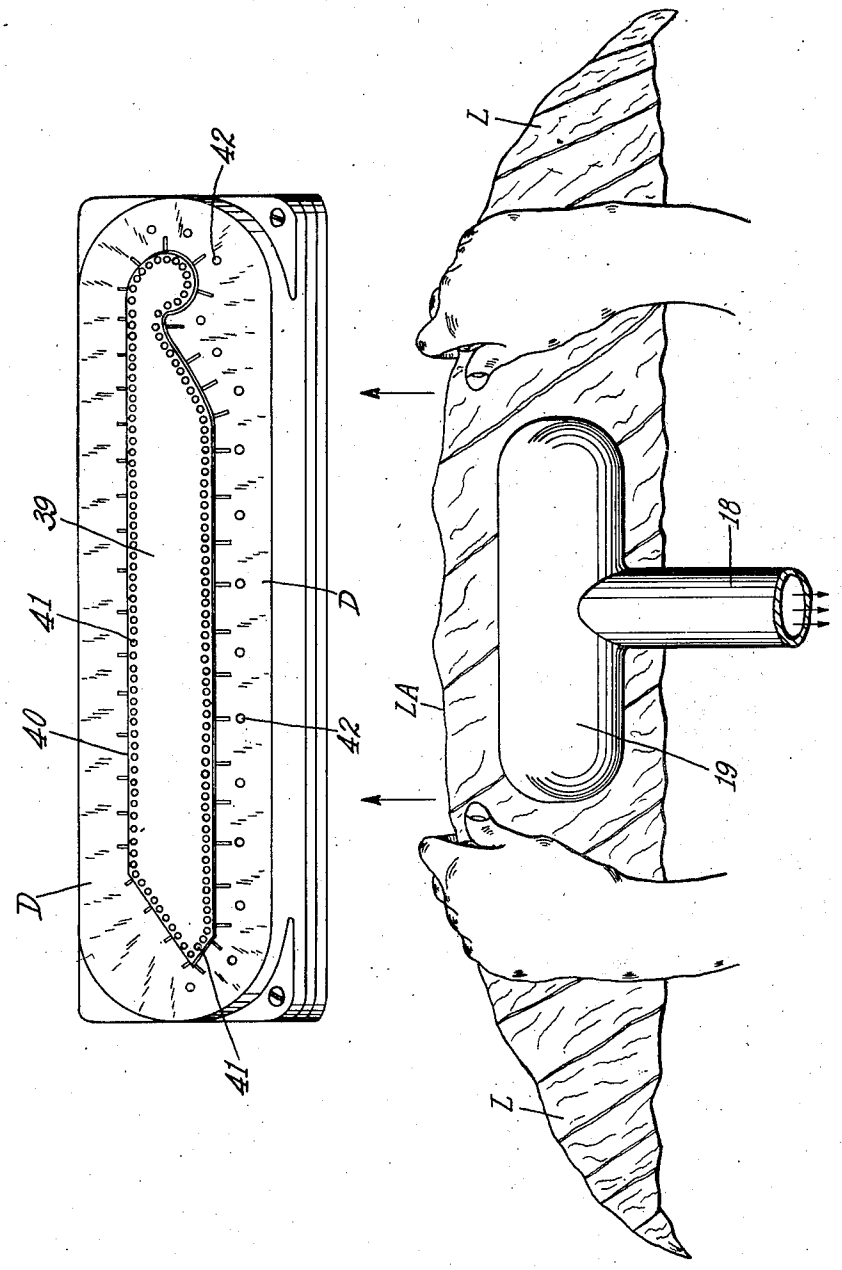
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LEAF SEPARATOR

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FIG. 3



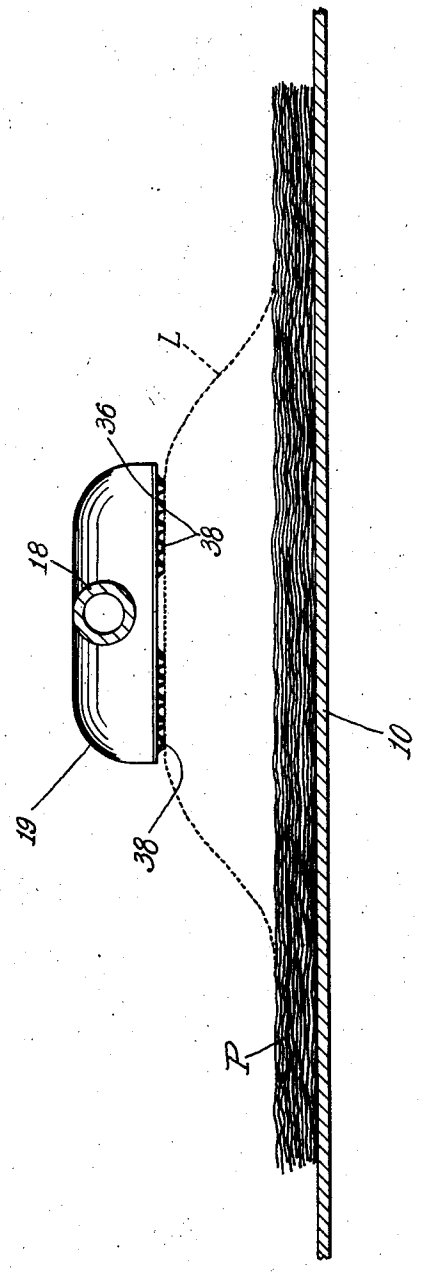
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LEAF SEPARATOR

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FIG. 4



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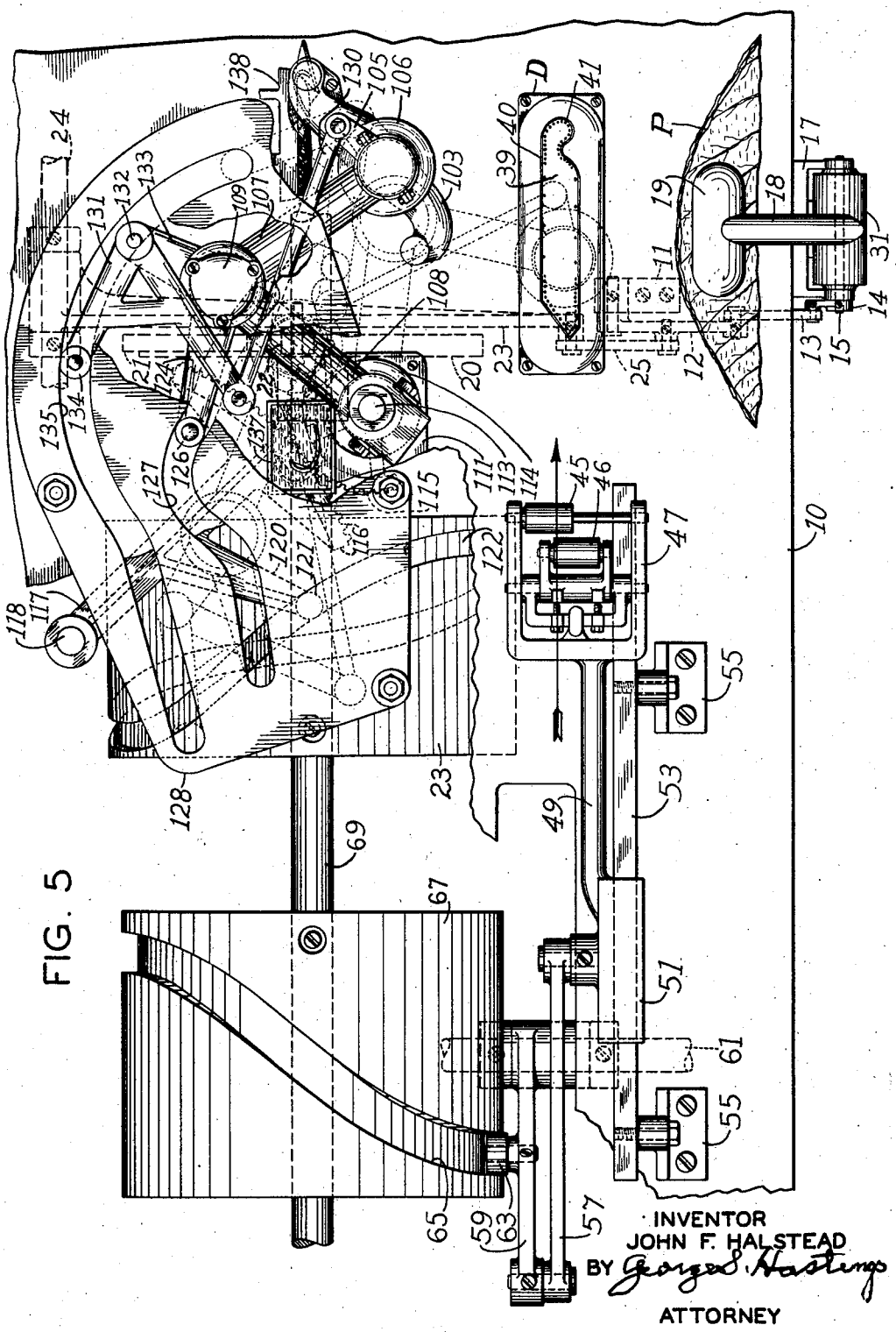


FIG. 5

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UNITED STATES PATENT OFFICE

2,416,173

LEAF SEPARATOR

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Application July 14, 1942, Serial No. 450,833

8 Claims. (Cl. 131—99)

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This invention relates to cigar machines, more particularly to the separation and removal of individual tobacco leaf sections from a "book" of stemmed leaf tobacco, in order to speed up the operation of laying the leaf sections on the cutting bed for severance of a wrapper. Heretofore a major portion of the time required for laying a leaf section on the cutting bed was spent in peeling the leaf section off the "book," as frequently a number of the leaf sections would be stuck together and would need to be manually separated. Therefore the main object of the invention is to separate a portion of the individual leaf sections from the "book," so that the remainder thereof may be manually separated from the "book" and the whole leaf section is then manually laid upon the cutting bed for severance of the wrapper. To this end there is provided apparatus for raising a portion of the top leaf from the "book," wherefore the attendant may insert her hands under the raised portion of this leaf and pass them between the remainder of said leaf and the "book" to complete the separation of the same, preparatory to grasping the forward edge of the ends thereof and thus transferring the leaf section to the cutting bed. With this and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter described and then set forth in the appended claims.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or like parts:

Fig. 1 is a plan view of the leaf separator device arranged adjacent the wrapper cutting die of a cigar machine;

Fig. 2 is a side elevation of the same;

Fig. 3 is a view showing the manner in which the operator transfers the wrapper leaf from the leaf separator to the wrapper die of the machine; and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 2, illustrating how the central portion of the top leaf is raised from the "book"; and

Fig. 5 is a plan view of a portion of a cigar machine equipped with the improved separator device.

Referring to the drawings, the table 10 of the cigar machine is provided with a bracket 11 on which is pivoted an arm 12 whose outer end carries one end of a link 13 connected to an arm 14 secured on a shaft 15. Shaft 15 is supported in hubs 16 of a bracket 17 carried by table 10, and

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shaft 15 also carries a hollow arm 18 provided with a hub 31 secured on said shaft and terminating in a head 19.

The arm 18 receives intermittent oscillating motion from a cam 20 having an auxiliary cam piece 21 which may be integral with or attached in any suitable manner to the periphery of said cam. The cam piece 21 is adapted to engage a cam roller 22 provided on a cam lever 23 which is fulcrumed on a shaft 24 of the cigar machine. The outer end of cam lever 23 supports one end of a link 25 connected to arm 12, and while the cam roller 22 rides on the cam piece 21 the arm 18 and head 19 are maintained in the raised position during the major portion of the cycle of operations. Cam 20 is fastened on shaft 69 (Fig. 5).

A tension spring 26 is anchored to a spring post 27 carried by link 25, the other end of spring 26 being anchored to a stationary part of the machine (not shown), to return the arm 18 to its down position and thereby press the head 19 against the top leaf section in the "book" P. It should be noted that the periphery of cam 20 intermediate the ends of the cam piece 21 does not support the cam roller 21, wherefore the spring 26 will depress the head 19 sufficiently to assure engagement thereof with the "book" P, as the height of the latter diminishes with the removal of successive leaf sections, and even when a single leaf section is left from the "book."

The bracket 17, which is fastened to table 10, carries a hollow block 28 having an angular projection 29 which at its upper portion is provided with a semi-circular shaped face 30 engaging the hub 31 of arm 18. The hub 31 is of a hollow cylindrical shape and has ends provided with holes through which shaft 15 passes. A port 35 is formed in the bottom of hub 31 and communicates with the inclined bore 34 in the angular portion 29 throughout all positions to which the hub is turned. A pipe 32, which may be connected to the source of suction (not shown) of the wrapper cutting bed, is fitted into a bore 33 of block 28 which communicates with the inclined bore 34 in the projection 29 which registers with the port 35 provided in hub 31. In this manner sufficient suction is maintained continuously within the head 19 to produce adhesion of the leaf section to the bottom 36 of the head 19, which is provided with holes 37, and thereby pick up one leaf L at a time from the pile of leaves P placed on table 10.

Preferably the width of the bottom 36 is less than the breadth of the leaf sections, so that the

pile P need not be placed to coincide with the depressed position of said bottom. The bottom 36 may be provided with spaced projecting teats 38 arranged in a manner to form an outer and inner circle at each end thereof, as shown in Fig. 1, the suction ports 37 being formed in said teats. The teats 38 are provided to assure adequate contact with the top leaf section of the pile which might otherwise be prevented by thick stems in said leaf section. Moreover the tension of the spring 26 is sufficient to press the bottom 36 upon the pile P with enough pressure to assure the proper contact thereon of the teats 38 despite the curling or wrinkling of the leaf sections in pile P.

The wrapper cutting bed D is mounted on the table 10 in front of the head 19, and comprises a hollow suction head 39 slidably mounted within the wrapper die 40 of bed D, the die having a predetermined contour to suit the shape of the cigar bunch which is to be wrapped. The interior of the head 39, and the shell surrounding the die, are connected to a source of suction in a well known manner, whereby the perforations 41 in head 39 and the perforations 42 in the shell surrounding the die hold the leaf tobacco in position while the cutting rollers 45 and 46 traverse the wrapper die and cut a wrapper from the leaf tobacco corresponding to the shape of the die. The cutting rolls 45 and 46 may be supported, as shown in Fig. 5, in the usual manner in the bifurcated end 47 of an arm 49 projecting forwardly from a support 51 slidably mounted on the slide-bar 53 mounted on brackets 55 which are suitably fastened to the table 10. The support 51 is connected by a link 57 to a cam lever 59 mounted on a shaft 61. On cam lever 59 is mounted a cam roller 63 which engages a cam track 65 in a barrel cam 67 fastened on the shaft 69.

Referring to Fig. 2, the operator of the machine places a "book" or pile of leaves P on table 10 in a position under the head 19, as shown. While the wrapper cutting rolls are traversing the cutting bed D, the cam piece 21 engages roller 22 and the arm 18 is caused to ascend to its dotted position 18 shown in Fig. 2. Thus the central portion of the top leaf section L is lifted from the pile P and the end portions of the leaf droop downwardly into contact with the pile P, as indicated in dotted lines in Fig. 4. While the central portion of the leaf section is thus raised, the operator passes her hands under the drooping end portions of the leaf section to separate the same from the pile P and grasps the hanging forward edge LA of the leaf sections, as shown in Fig. 3, and slides it from the suction head 19 in the direction indicated by the arrows and places the leaf section L upon the wrapper cutting bed D of the machine.

After the wrapper has been cut from the leaf tobacco, the cutting rolls return to their initial position shown in Fig. 5, and the suction head is then elevated to deliver the cut wrapper to the means for transferring the wrapper to wrapper-applying mechanism. Any suitable form of wrapper transferring device may be used, such as that shown in Fig. 5, which is identical in construction with the wrapper delivering means shown in the patent to R. E. Rundell, No. 1,539,274.

Referring to Fig. 5 of the drawings, the hollow flying wrapper carrier 103 is of the usual construction, having a hollow stem pivotally mounted in the free end of carrier supported means, and provided at its upper end with an arm 105 by means of which it is rocked in a boss 106 formed

on the free end of the carrier supporting means. The carrier supporting means consists of two hollow interconnected sections 107 and 108 which are articulated at 109 approximately at the center of said means. The end of the carrier supporting means opposite the boss 106 is secured to the upper end of a vertical pipe (not shown) mounted in a standard 111 rising from the table 10 of the machine. The lower end of the pipe is connected by a tube, not shown, with suitable suction producing means of a well known character. The upper end of the pipe is closed by a cap 113, and the interior of the pipe is in open communication with the interior of the section 108 of the carrier supporting means. The section 108 is secured to the upper end of the pipe by means of a clamping bolt 114. The pipe not only serves as a part of the suction apparatus for holding a wrapper on the carries 103, but it also serves as a rock-shaft by means of which the carrier supporting means is moved about the anchorage. With this end in view, a segmental gear 115 is secured upon the pipe below the table 10. The segmental gear 115 is in mesh with a segmental gear 116 formed on an arm 117 fulcrumed at 118. The arm 117 carries a branch arm 120, which in turn carries a cam bowl 121 tracking in a cam groove 122 formed on the perimeter of a cam drum 23 which is mounted on the shaft 69. The mechanism just described oscillates the section 8 about the anchorage for the flying wrapper carrier.

Means are provided for controlling the relative movement of the sections 107 and 108, which controls the movement of the axis of the flying wrapper carrier and, as shown, this means has a direct connection with the movement controlling device for the carrier. With this end in view, the section 107 of the carrier supporting means is provided with a horn 124, upon the free end of which is a cam bowl 126 tracking in a cam slot 127 formed in a cam plate 128. As the section 108 is swung about the anchorage, the engagement of the cam bowl 126 with the cam slot 127 alters the relative positions of the sections 107 and 108 and controls the path of movement of the axis of the flying wrapper carrier.

The flying wrapper carrier is also given a rocking movement on its axis. This is accomplished in the following manner: The arm 105 before referred to is pivoted to one end of a connecting rod 130, the other end of said rod being pivoted to a bell-crank 131. This bell-crank is fulcrumed at 132 to a horn 133 projecting from the section 108 beyond its point of articulation with the section 107. The bell-crank 131 carries a cam bowl 134 tracking in a cam groove 135 formed in the cam plate 128 before referred to. By means of the mechanism just described, as the section 108 is moved about the anchorage, the engagement of the cam bowl 134 with the cam slot 135 changes the relative angular positions of the section 107 and the flying wrapper carrier.

The carrier 103 moves the wrapper over the paste applying mechanism 137 also of the usual type, which applies paste to the flag end of the wrapper. In Fig. 5, the various parts are shown in full lines in the position they occupy when the greater part of a wrapper has been applied to a bunch in the wrapping mechanism which is diagrammatically indicated at 138, and the position of some of the parts is indicated in said figure by dotted lines in the two extreme positions of the flying wrapper carrier; that is, a position over the wrapper cutting die at the forward end of

the movement of the wrapper carrier, and at a position over the paste applying mechanism 137.

As often happens, the leaf section L is large enough to permit two or more wrapper sections to be cut therefrom. When this occurs the operator re-positions the leaf on the die so that another wrapper will be cut from it by the cutting rolls. In the meantime the head 19 has previously ascended with the next leaf. If the operator is still using the previously cut leaf section, the head 19 will descend and return the adhering leaf section to the pile, since suction is maintained continuously within the head. The leaf section so returned to the pile will again be lifted, and if at this time a new leaf section is needed, the operator will grasp the same and remove it from head 19.

While the invention has been illustrated in conjunction with wrapper cutting and applying mechanism, it will be understood that it may be applied to separation of binder leaf tobacco from a "book" for manual transfer to the binder cutting die. In this case it is desirable to enlarge the holes 37 in head 19 to assure adhesion of the heavier binder tobacco to the head.

What is claimed is:

1. The combination with a perforated suction head, of automatic mechanism for moving said head to engage the perforated portion thereof with the top leaf of a pile of leaf tobacco with sufficient pressure to cause adhesion of said top leaf to said perforated portion, said perforated portion constituting the bottom of said head and being provided with teats in which said perforations are formed, and said mechanism including means for yieldingly pressing said head into engagement with the top of a pile of leaf tobacco whereby the bottom of the head will be engaged with the top of said pile irrespective of variations in the height of the pile due to depletion thereof, said head being provided with a hollow extension, a hollow hub formed on said extension, a shaft to which said hub is secured, said mechanism being connected to said shaft for moving said head into engagement with the top of said pile and then elevating the head with an adhering leaf, said hub being provided with a suction port, a suction conduit having an arcuate face engaging said hub, the breadth of said conduit being sufficient to permit said hub to be turned without interrupting the communication between said port and said conduit whereby suction will be maintained continuously in said head.

2. In a cigar machine having a wrapper cutting die, cutting rolls adapted to coact with said die to cut a wrapper from leaf tobacco spread thereon and mechanism for periodically moving said rolls from an initial ineffective position to and fro over the die to cut a wrapper from leaf tobacco on the die; the combination with means driven from said machine in properly timed relationship thereto for separating an individual leaf section from a pile of leaf tobacco while said rolls are traversing said die, whereby the leaf section may be manually removed from said means and positioned upon the die when the cutting rolls are returned to said initial position, for severance of a wrapper from the leaf section so positioned on the die in the next traverse of the rolls over the die, and mechanism for transferring the severed wrapper from said die after said rollers have returned to their initial position, said means including a suction head having a perforated portion adapted to engage the top leaf section in the pile of leaf tobacco, a device for lowering said head to engage the perforated portion thereof with the top of said pile and cause adhesion thereto of the top leaf section in the pile and then raising said head with the adhering leaf section while the cutting rolls are traversing the die, and means for continuously applying suction to said head to produce suctional adhesion of the next leaf section in said pile thereto following the manual removal of the preceding leaf section from said head which will continue until the said next leaf section is manually removed from said head whereby the cut leaf section may be manually repositioned on said die for cutting of an additional wrapper therefrom while the said next leaf section continues adhering to said head.

3. In a cigar machine having a cutting bed whereon leaf tobacco may be positioned for severance of a section therefrom by the passage of cutting rolls thereover in each cycle of the machine, the combination with a hollow member supporting a hollow head portion disposed in front of said die and adapted to engage the mid-section of the top leaf section in a pile of leaf tobacco disposed in front of said die, the leaf tobacco in said pile extending lengthwise of said die, of means for continuously applying suction to said hollow member to create suction in said head portion, and means for automatically lowering said head portion to engage the same with the top leaf section in said pile in each cycle of the machine to cause suctional adhesion of the mid-section of said top leaf to said head portion, and then raising said head portion in the same cycle with the adhering midportion of said top leaf section sufficiently to permit the attendant's hands to be passed under the end portions of the top leaf section for separation thereof from the pile, whereby the ends of the adhering leaf section may be manually grasped and said leaf section thereby drawn off the suction head and laid upon the die in the next cycle, and the next leaf section removed from said pile will continue adhering to said head portion until removed manually.

4. The combination with a perforated suction head, of automatic mechanism for moving said head to engage the perforated portion thereof with the top leaf of a pile of leaf tobacco with sufficient pressure to cause adhesion of said top leaf to said perforated portion, said perforated portion constituting the bottom of said head and being provided with rigid teats in which said perforations are formed, said teats projecting downwardly from the bottom of said head a sufficient distance to engage the web of the top leaf section despite the presence of thick stems in said leaf section, and said mechanism including means for pressing said head into engagement with the top of a pile of leaf tobacco with sufficient pressure to assure proper contact of the head therewith despite curling or wrinkling of the leaf sections in the pile.

5. The combination with a perforated suction head, of automatic mechanism for moving said head to engage the perforated portion thereof with the top leaf of a pile of leaf tobacco with sufficient pressure to cause adhesion of said top leaf to said perforated portion, said perforated portion constituting the bottom of said head and being provided with rigid teats in which said perforations are formed, and said mechanism including means for yieldingly pressing said head into engagement with the top of a pile of leaf tobacco with sufficient pressure to assure proper contact of the head therewith despite curling or wrink-

ling of the leaf section in the pile whereby the bottom of the head will be engaged with the top of said pile irrespective of variations in the height of the pile due to depletion thereof, said teats projecting downwardly a sufficient distance from said bottom to properly engage the web of the top leaf section despite the presence of thick stems in the leaf section.

6. In a cigar machine having a wrapper cutting die, cutting rolls adapted to coact with said die to cut a wrapper from leaf tobacco spread thereon and mechanism for periodically moving said rolls from an initial ineffective position to and fro over the die to cut a wrapper from leaf tobacco on the die; the combination with means driven from said machine in properly timed reltionship thereto for separating an individual leaf section from a pile of leaf tobacco while said rolls are traversing said die, whereby the leaf section may be manually removed from said means and positioned upon the die when the cutting rolls are returned to said initial position, for severance of a wrapper from the leaf section so positioned on the die in the next traverse of the rolls over the die, and mechanism for transferring the severed wrapper from said die after said rollers have returned to their initial position, said means including a suction head adapted to engage the top leaf section in the pile of leaf tobacco, a device for lowering said head to engage with the top of said pile and cause adhesion thereto of the top leaf section in the pile and then raising said head with the adhering leaf section while the cutting rolls are traversing the die, and means for continuously applying suction to said head to produce suctional adhesion of the next leaf section in said pile thereto following the manual removal of the preceding leaf section from said head which will continue until the said next leaf section is manually removed from said head whereby the cut leaf section may be manually repositioned on said die for cutting of an additionally wrapper therefrom while the said next leaf section continues adhering to said head.

7. The combination with a suction head adapted to engage the top leaf section in a pile of leaf tobacco disposed in front of a bed, of a suction conduit in communication with the interior of said head for creating suction therein, and means for lowering said head to engage it with the top leaf section in said pile to cause suctional adhesion of a portion of said top leaf, and then raising said head with the adhering portion of said

top leaf section sufficiently to permit the attendant's hands to be passed under said adhering portion for separation of the remainder thereof from the pile, whereby the leaf section will continue adhering to said head until manually grasped and drawn off the suction head and laid upon said bed, and a device connecting said suction conduit with the interior of said head to maintain suction constantly in the head while it is moved to and fro from its lower position to its upper position and back to its lower position.

8. In a cigar machine having a cutting die, cutting rolls adapted to coact with the die to cut a wrapper from leaf tobacco spread thereon, mechanism for periodically moving said rolls from an initial ineffective position to and fro over the die to cut a wrapper from leaf tobacco spread on the die, and mechanism for transferring the cut wrapper from said die after the cutting rolls have returned to their initial position; the combination with a suction head engaging the top leaf in a pile of leaf tobacco disposed in front of said die, to cause suctional adhesion of said top leaf to said head, and means driven from the cigar machine and operated during each traverse of said rolls over said die to raise said head with the adhering leaf while said rolls are traversing said die whereby the adhering leaf may be manually removed from said head to be positioned on said die after the cutting rolls have returned to initial position, and instrumentalities for applying suction to said head.

JOHN F. HALSTEAD.

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