United States Patent

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[72] Inventors **Harry Allison Hooper**
Larchmont, N.Y.;
Frank Hollenton, Richmond, Va.; Warren Arthur Brackmann, Ontario, Canada

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[73] Assignee **AMF Incorporated**

[54] **PATCH-FEEDING DEVICE FOR CIGAR-MAKING MACHINE**
11 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **221/73**
[51] **Int. Cl.** **B65h 5/28**
[50] **Field of Search** ..... 221/25, 70—74, 211

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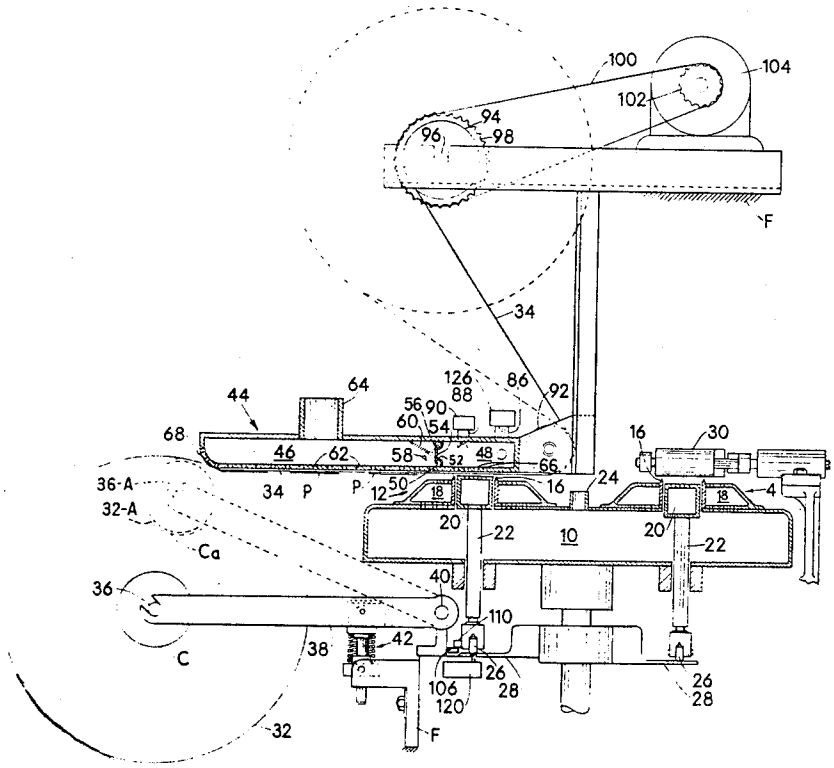
Primary Examiner—Samuel F. Coleman
Attorneys—George W. Price and Murray Schaffer

ABSTRACT: Apparatus for feeding stretched oriented tobacco leaf patches from a roll into the die turret of a cigar machine.



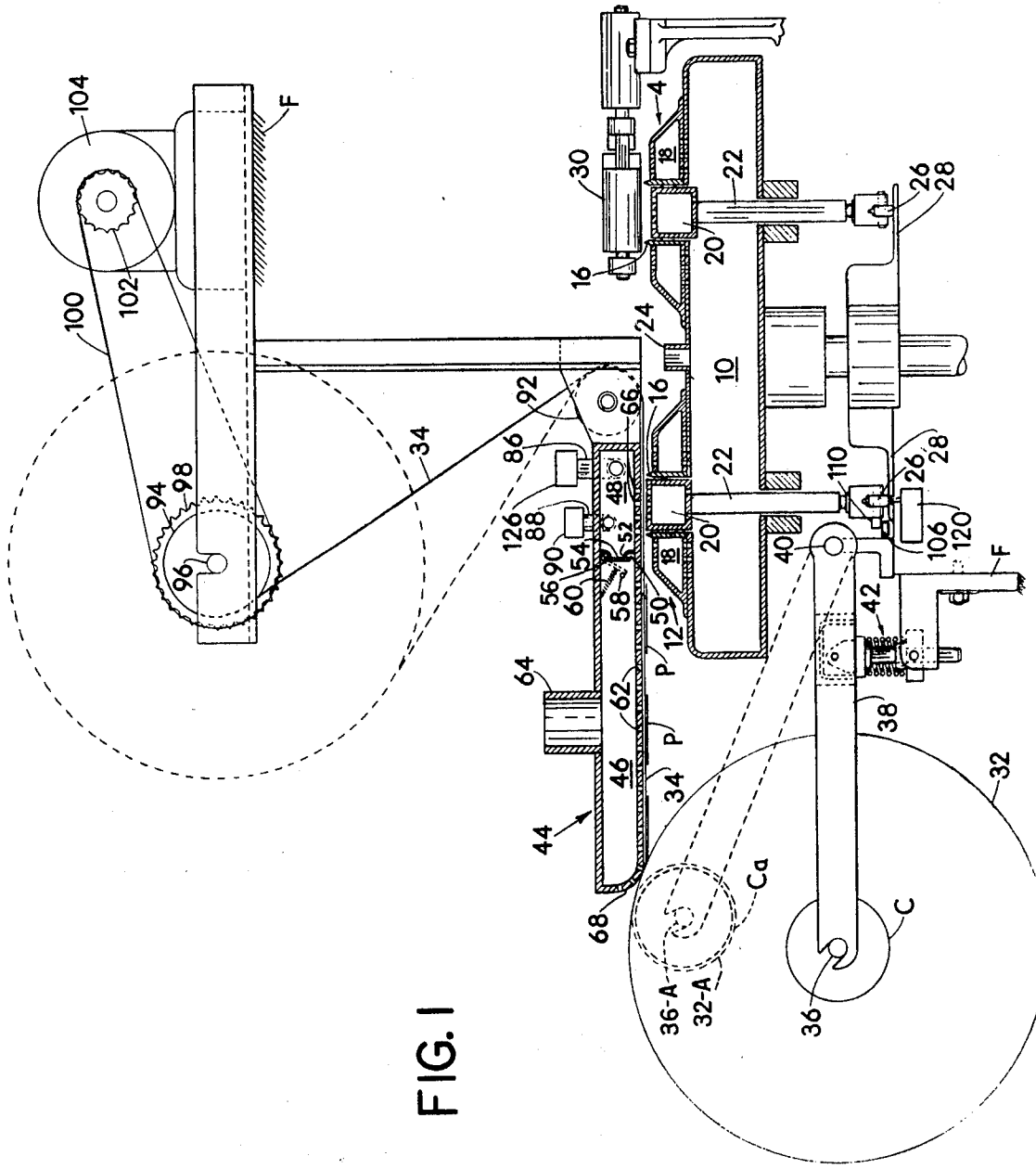


FIG. 1

INVENTORS
HARRY ALLISON HOOPER
BY FRANK HOLLENTON
WARREN A. BRACKMANN
ATTORNEY

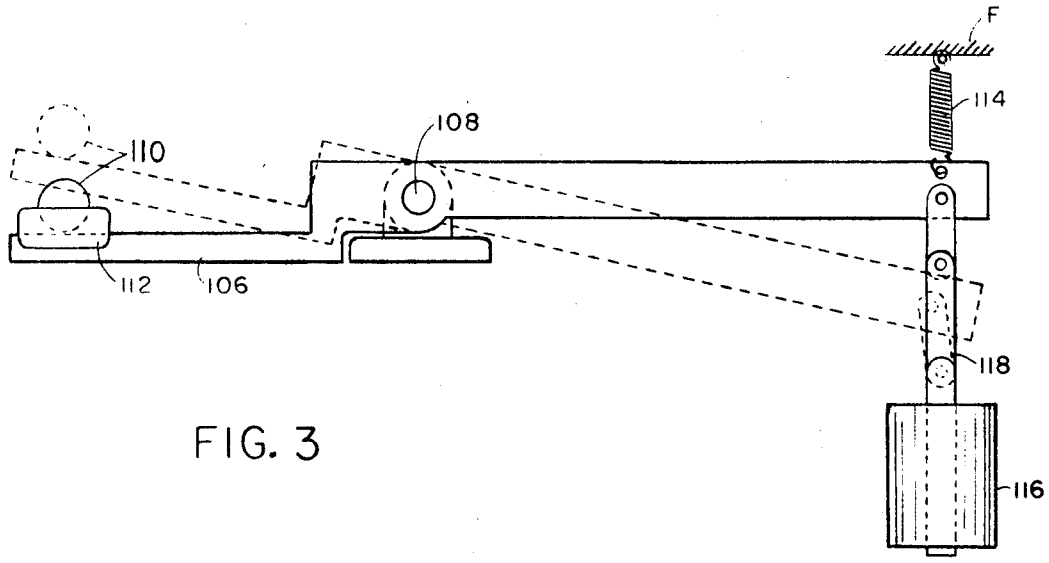


FIG. 3

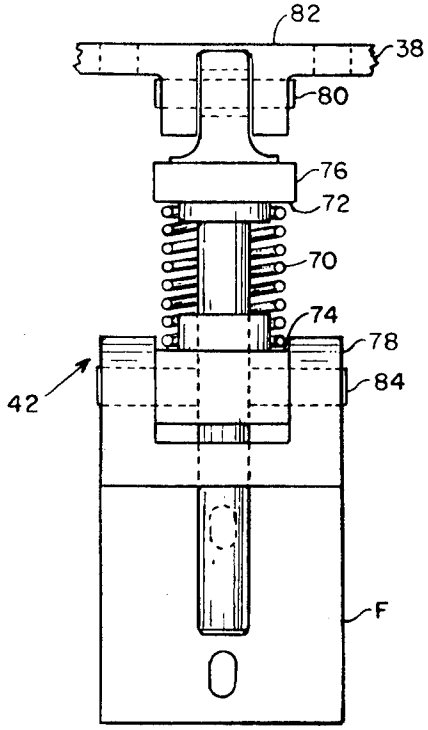


FIG. 2

INVENTORS
HARRY ALLISON HOOPER
FRANK HOLLENTON
WARREN A. BRACKMANN
BY Thurman Scharff
ATTORNEY

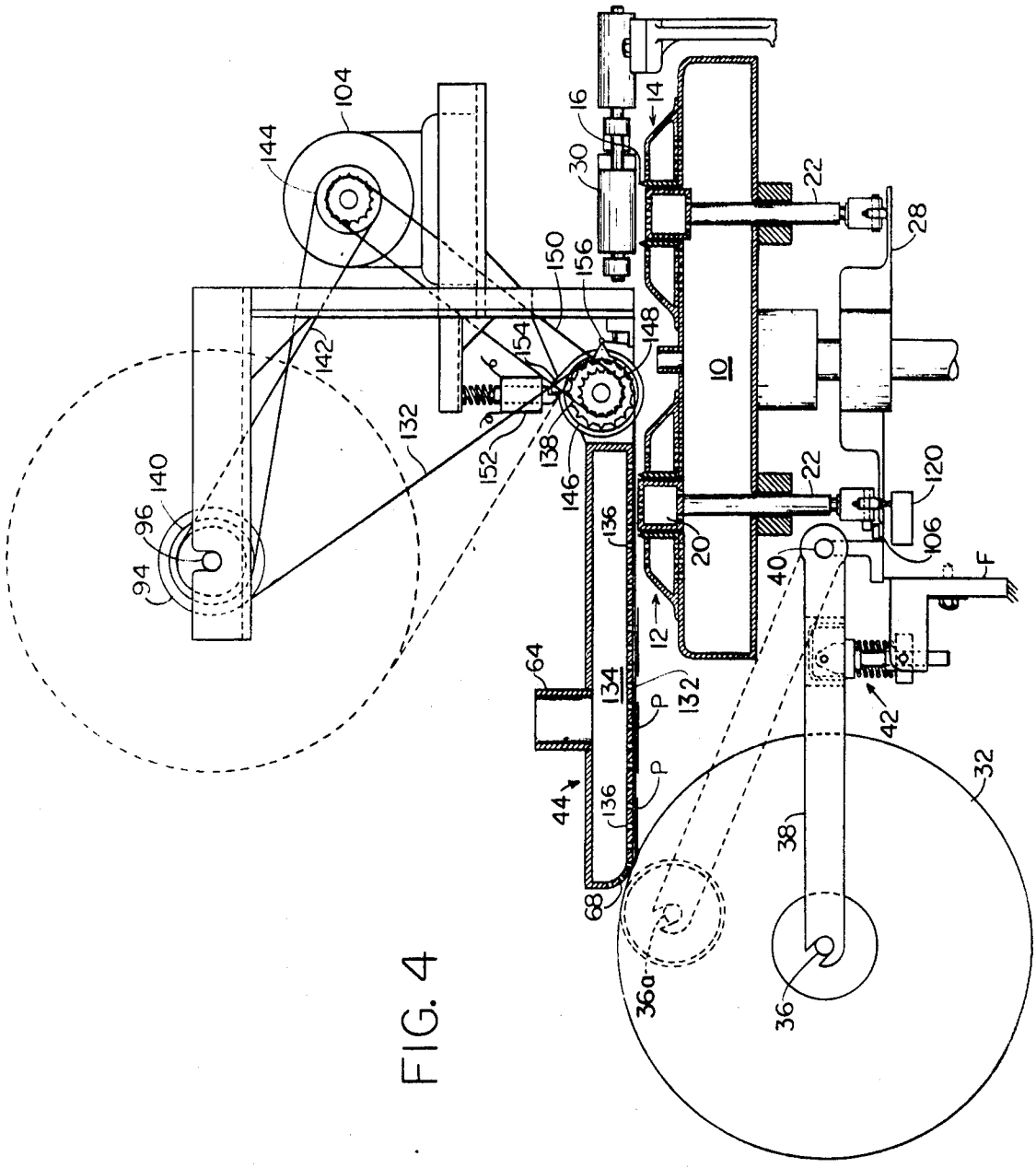


FIG. 4

INVENTORS
HARRY ALLISON HOOPER
FRANK HOLLENTON
WARREN A. BRACKMANN
BY
ATTORNEY

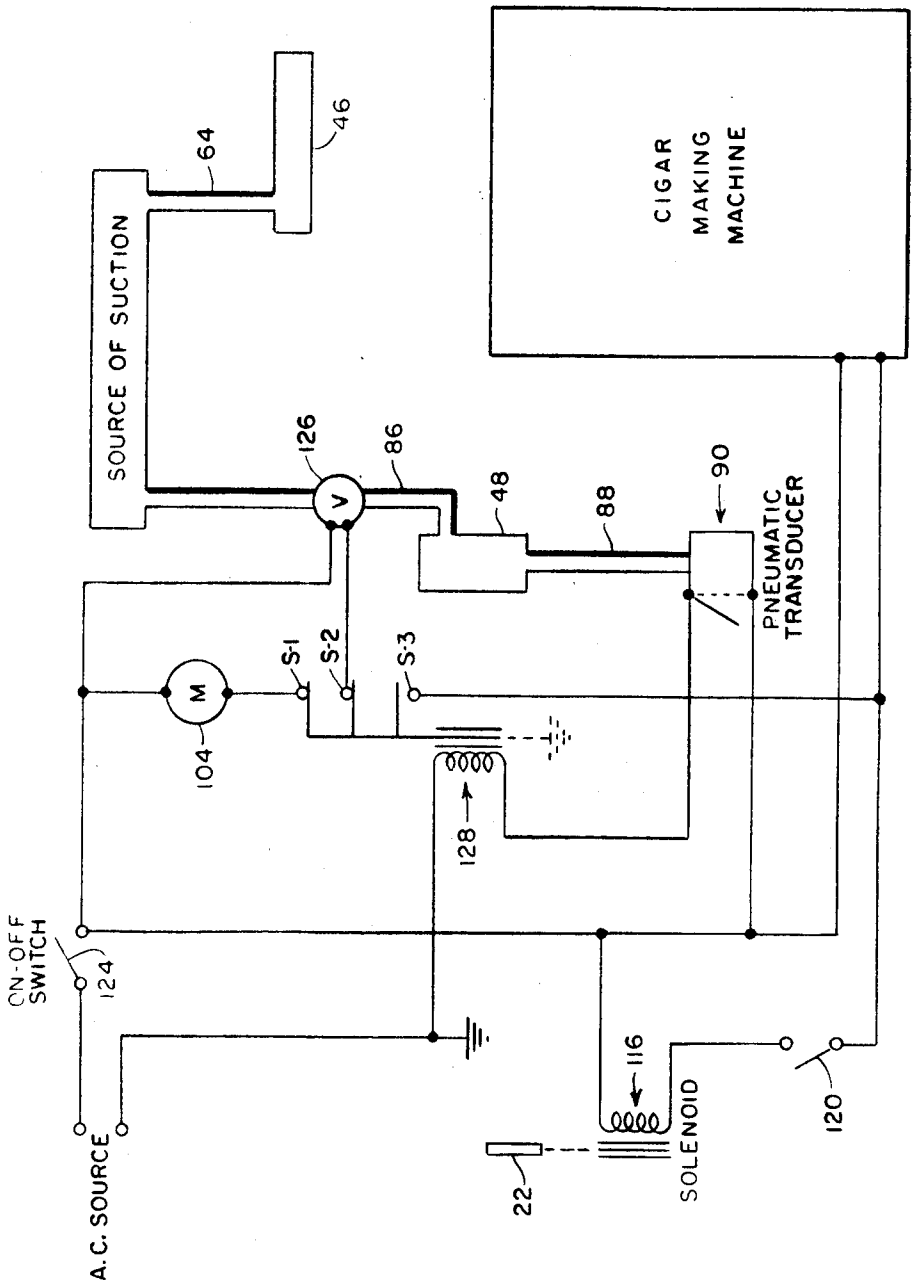


FIG. 5

INVENTORS
HARRY ALLISON HOOPER
FRANK HOLLENTON
WARREN A. BRACKMANN
BY Thomas Schaff
ATTORNEY

PATCH-FEEDING DEVICE FOR CIGAR-MAKING MACHINE

This invention relates generally to the production of cigars and particularly to a method and apparatus for automatically feeding individual wrappers or binders to cigar-making machines of the type of cigar-making machine on which cigars are produced serially, one at a time, by rolling them laterally to perform the wrapping operation.

Such cigar-making machines have been in use for many years and are still employed for the production of cigars from natural or reconstituted leaf. It is usual in such machines to form a shaped core of tobacco filler by one of two different methods, depending upon whether the filler is composed of small pieces of tobacco leaf, generally known as "short filler," or composed of much larger-stemmed whole leaf arranged substantially longitudinally in the cigar, generally known as "long filler." In either case, the shaped core of tobacco is wrapped in a first sheet, usually termed the binder, and then in a second sheet, usually termed the wrapper, both of which in many cigars are made from natural tobacco leaf.

It is well known that the cigar industry is such that a very large variety of cigar shapes and sizes are necessary to meet the market conditions, most of which are cylindrical in shape, tapering to a relatively small diameter at least at one end, while at the other end the shape may vary widely, but may frequently be a somewhat similar taper, ranging to hemispherical.

In addition, custom demands that the wrapper, at least, be applied in a helical fashion so that the overlap of the wrapper sheet is seen on the finished cigar as a helical ridge running around it. Thus to produce the good, smooth appearance, which is necessary, it will be appreciated that a wrapper must conform to the peculiar shape of the finished cigar so that it may be wrapped smoothly around it, the wrapper must be cut to complex shape and presented to the cigar-shaped roll of filler in the correct attitude so that it is supplied to the roll in a precise manner.

For this purpose the cigar maker is provided with at least two cutting dies mounted on a turret arranged to index about a vertical axis. One turret being provided for each of the binder and wrapper functions respectively. Each cutting die is surrounded by a perforated surface, the perforation being connected to a source of vacuum whereby to hold a leaf taut across the die.

An operator sits in convenient proximity to the die turret, selects a portion of tobacco leaf, examines it for holes, coarse veins or other imperfections and stretches it over the cutting die where it is held in stretched, creaseless formation by the vacuum applied via the perforations in the surface surrounding the die, care being taken to ensure that the contour to be cut by the die will not include any imperfections. Having placed the leaf portion in position, the operator initiates one cycle of the cigar-making machine, usually by means of a foot switch, which causes the turret to index to the next position where the leaf stretched over the die is cut out. The cut leaf is then transferred from the die to be rolled about the shaped roll of tobacco filler. Simultaneously the turret movement had presented to the operator of the second turret dies on which there had been previously spread and cut a wrapper. This second die has the remainder of the leaf of the wrapper suctionally held on the perforated surface. This the operator removes and either discards, or places over the die again in a new position if, as frequently happens, sufficient leaf area remains to enable a whole binder or wrapper shape to be cut from the remainder.

From this it will be seen that the speed of production of the cigar maker is determined by the speed at which the operator can successively place the leaf portion over the dies.

To assist in this operation, whole tobacco leaves are preprepared and arranged in an orderly stack from which the operator may manually remove the topmost leaf portion for placement over the die without loss of time or motion. Such

preparation is usually termed "booking," and it is the universal practice to precede the booking of leaves by an operation to remove the coarse midrib from each tobacco leaf, which operation severs it longitudinally. Each half of the leaf is booked in a separate pile for, as is well known, the subsidiary veins on the leaf run out from the midrib diagonally and have a different texture on the front as compared with the back so that each half of the leaf is a mirror image of the other as far as veins are concerned. It is usual in the industry to feed the differing halves of leaves to different cigar-making machines to avoid mixing the production of cigars showing the vein pattern in a different position relative to the axis of the cigar.

For this reason it is not possible to provide the cigar machine operator with whole, unstemmed leaves, for should such leaves be used and successively repositioned over the die as each shape is blanked out, the coarse midrib could easily be avoided, but cigars would be produced, half of which would show the vein pattern different from the other half. Also, some tobacco leaves are quite large which, if positioned on the rotating die turret, would occupy an inconveniently large space, interfering with the machine's operation.

For these reasons it is the universal practice to remove the coarse midrib from each leaf, which operation is usually known as "stemming," thereby separating the leaf into two parts and to book each half of the leaf separately.

Consequently, it will be appreciated that the preparation of tobacco leaf for use as wrapper and/or binder and the subsequent application of such leaf in the actual formation of the cigar is complex, consisting of a number of mechanical and manual steps; time consuming, requiring separate visual, manual and intellectual functions on the part of the operator; and wasteful of tobacco in that often good tobacco lamina is discarded with the stem, or tobacco is incorrectly "booked" and leaf is misapplied to the turret die.

It is the prime objective of this invention to eliminate these deficiencies of operation, speed up the production of cigars and provide for a more economical use of tobacco and labor.

Accordingly, it is an object of this invention to provide means for automatically feeding cigar wrappers to a cigar-making machine.

Another object of this invention is to feed cigar wrappers to a cigar-making machine at such a rate that they are available to the machine faster than the machine can use them.

Another object is to eliminate the need for an operator to feed wrappers to the cigar-making machine.

Another object is to deliver cigar wrappers to a cigar-making machine in such a way that they are received by the existing die turret by which they are carried away.

Another object is to hold the booked cigar wrappers in the smooth stretched condition until they are received by the cigar-making machine.

Another object of this invention is to employ the booking means as means for transporting the wrappers to the cigar-making machine.

Another object of this invention is to deliver the cigar wrappers to the correct position on the cigar maker die turret irrespective of the position of the wrapper in the booked reservoir.

In this description, the term cigar "patch" will be used to mean a shaped portion of tobacco leaf or manufactured tobacco or other material sheet. It will be understood to include both binder and wrapper, in the finished contour, or slightly larger than finished size, from which the finished piece can be cut.

In the accompanying drawings which from part of this specification, like characters of reference have been applied to corresponding parts throughout all drawings.

FIG. 1 shows a side elevation of the apparatus and includes an outline of the cigar-making machine die turret onto which the cigar wrapper is being delivered;

FIG. 2 is a side view of the counterbalance spring device;

FIG. 3 is a view of the turret transfer lifting mechanism;

FIG. 4 is a side elevation showing an alternative method of feeding; and

FIG. 5 is a diagram of the electrical circuitry employed in the operation of the present device.

This invention is directed to the automatic feeding of separately booked cigar patches to cigar machines and employs patches stored in the form of a roll interleaved and supported by a porous web wound upon itself in such a way that the patches are stored in a flat and stretched condition. Such a storage roll and means for producing such rolls of booked wrappers are disclosed in out copending applications, Ser. No. 790,277 and Ser. No. 790,278, to which reference is incorporated herein as if more fully set forth.

The present invention will be first described in connection with the employment of presently available cigar-making machines of which a great number are in constant use in the industry. Only minor modification to the existing machines is necessary to adapt them for the present invention, and it is therefore felt that it is only necessary to briefly sketch those elements which are directly effected. Attention is made to U. S. Pat. Nos. 3,225,772; 3,222,967; 3,187,756 and 3,152,497 amongst others which show cigar-making machines in great detail, the description of which is incorporated herein by such reference should it be necessary to refer to any specific structure.

Before turning to the present invention a brief description of the appropriate patch feed and delivery means for existing cigar machines is in order. Such means comprise inter alia (see FIG. 1) a turret 10 having a receiving station 12 and a transfer 14 mounted about a central axis. Each station 12 and 14 consists of a die 16, having a thin hardened steel wall shaped in plan view to the complex contour desired for the finished wrapper shape. The upper edge of this shaped steel wall terminates in the form of a sharp V-shaped cutting edge which is adapted to cut the leaf. The cutting edge carefully made to occupy a single plane. Surrounding the die is a two-part vacuum shell 18 perforated in its upper and lower faces, while inside the die is a hollow head 20 which conforms to the complex inner contour of the die, and is perforated in its upper face and lower faces for the application of vacuum as required. The head 20 is secured on the end of a plunger 22 and is movable in a vertical direction. A fitting 24 mounted on the turret 10 is connected to a source of vacuum-applying suction through the perforation onto upper faces of shell 18 and head 20.

The operator when manually working this machine stretches the tobacco leaf portion over receiving station 12, the head 20 remaining substantially level with the surrounding vacuum shell 18 and with the top edge of the die 16. Suction means acting through the head and the shell holds the leaf in stretched position. The leaf is then carried to the machine by the turret which is made to index from the left to the right, rotating it about its central axis to the transfer station 14. The level of the head 20 is controlled throughout the period of rotation by means of wheel 26, mounted at its lower extremity, running around the supporting cam track 28.

Upon reaching the right-hand position or transfer station 14 as indicated in FIG. 1 a cylindrical roller 30 is caused to pass over the top of the die 16, crushcutting the stretched leaf by cooperating with the cutting edge. The head 20 is then caused to rise, by actuating the plunger 22 lifting the now blanked-out wrapper above the plane of the die, from which position the wrapper is passed on to a suction transfer mechanism, (not shown) ultimately to be wrapped about a cigar filler core. The next movement of the turret returns the die assembly to the receiving position still carrying the waste or unused remainder of the leaf adhering to the shell 18. The operator removes this unused leaf before stretching a new piece of leaf over the station. Under some circumstances, the same piece of leaf may be sufficiently large to be repositioned and a second wrapper formed from it. This procedure continues indefinitely.

It will be appreciated that the speed of operation is in greatest measure determined solely by the speed at which the operator works, since the operator must spread a leaf properly, index the turret, remove old leaf and respread a second leaf. This operation is time consuming and tiresome. Consequently, the need for the present invention is manifest.

As described briefly heretofore, the present invention provides for the automatic feeding of prestretched patches in booked rolls in almost continuous fashion to the cigar machine, eliminating manual operation. In order that the maximum number of patches may be contained in the booked roll, it is desirable to position the patches with their longest dimension parallel with the axis of the roll. It has been found that by employing a suitably thin porous web it is possible to produce a roll of reasonable size, say 14 inches diameter, which will contain sufficient patches to keep the cigar-making machine running for about half a day at the existing speed. From this it follows that very little manual supervision is required and little loss of time is experienced in replenishing patch supply rolls. All of such features are described in detail in the aforementioned copending applications.

Referring to FIG. 1, there is to be seen apparatus for delivering the patches from a booked roll to an existing cigar machine. The roll or bobbin 32 of booked cigar patches P is contained on a core C between the webbing 34 of an endless belt. The core C is supported on its axis 36 by a pair of arms 38 which are pivoted at 40. The weight of the roll 32 is counterbalanced by a spring device 42 which is designed to press the roll upwardly with a substantially constant force as the roll is consumed.

A hollow box 44 is positioned as shown above and slightly to the rear of roll 32, and is divided into two compartments 46 and 48. A dividing wall 50, pierced with a large opening 52, which is closeable by means of a flap valve 54 pivoted about an axis 56, separates the two parts. The valve 54 is held in the normally open position shown in dotted lines against a stop 58 by a light tension spring 60.

The lower face of the compartment 46 is furnished with a series of holes 62 and a fitting 64 connected to a source of vacuum such as a suitable fan or pump (not shown) communicates with the interior of compartment 46. The secondary compartment 48 is also furnished with a series of holes 66, along its bottom surface, but in this case the holes are arranged in a definite pattern similar to that of the die 16 to match the size and shape of the cigar patch to be handled, as more fully explained. The entire bottom surface of the box 44 is smooth and the box is provided with a rounded forward edge 68 against which the outer surface of the webbing 34 abuts.

The webbing 34 is caused to abut against the surface of the edge 68 by action of the spring device 42 as seen in FIG. 2 which comprises a compression spring 70 secured between the shoulders 72 and 74 of an upper and lower pivot mount 76 and 78, respectively. The upper mount 76 is pivoted about an axle 80 secured to a crossmember 82 secured at each end to one of the roll-holding arms 38. The lower mount 78 is pivoted about axle 84 secured to bracket forming part of the machine frame F.

It will be readily seen that as the bobbin 32 gets smaller, the compression springs in the device 42 will cause the bobbin arms 38 to pivot about 40, lifting the bobbin to maintain the roll and the web 34 in contact with the surface of box 44, the springs extending as this occurs. By choosing the correct spring rate to match the reduction in weight of the roll 32, the pressure of the roll against the box is easily maintained constant. The dotted lines 32*a* shows the position and size of the roll 32 when it is all consumed, the axis 36 then having moved to position 36*a*.

As stated above, the flap valve 54 is normally open so that as air is pumped via the fitting 64 it can enter the compartment 48 via holes 66, from whence it passes into compartment 46 via opening 52. At the same time air enters the larger compartment 46 directly via holes 62. Compartment 48 is furnished with a fitting 86 of its own which can also be connected at appropriate times to a source of vacuum somewhat higher than that connected to compartment 46 via fitting 64. Also communicating with compartment 48 is pipe 88 transmitting the air pressure in that compartment to an electropneumatic switch 90 of known construction in which the vacuum moves a diaphragm to operate an electrical switch or

switches, which may be adapted to change electrical circuits responsive to the vacuum in compartment 48.

Substantially tangent to the undersurface of box 44 is mounted a roller 92, freely rotatable about its own axis, while substantially above the box 44 a bobbin core 94 similar to that employed to support the roll of booked cigar wrappers is mounted on its axis 96. Mounted to the axis 96 is a sprocket 98 which in turn is connected by chain 100 to sprocket 102 mounted upon the shaft of electric motor 104.

It will then be observed that on actuation of motor 104 the webbing 34 can be caused to unreel from bobbin 32 and reel itself upon core 96, simultaneously passing along the under surface of the box 44, where by action of the suction source the patches P contained on the webbing are held firmly and in fixed position relative thereto although moving therealong.

It is now seen that with the aforementioned apparatus the patches P can be fed from the book bobbin 32 to a position directly above the receiving station 12 of turret 10. As so far described, little alteration is made to the cigar machine itself, only the table at which the operator would normally sit has been removed and replaced with the described mechanism. One further adaptation is necessary and that is to provide for the raising of plunger 22 while it is in the left-hand or receiving position, in order to remove the presented patch P from the webbing 34 and transfer it to the surface edge of the die 16.

This is accomplished by mounting a lever 106 below the receiving station 12 and below the lower edge of plunger 22 tangentially to the circular cam track 28. The lever 106 (FIG. 3) is pivoted at substantially its center 108 and has a forward extension extending adjacent to the wheel 26 at the lower end of the plunger. The wheel 26 is mounted to the plunger 24 by a pin 110 which extends radially outwardly of the circular track 28 over the terminal portion 112 of the lever. The rearward end of the lever 106 extends some distance and is connected to a compression spring 114 mounted above it to the machine frame F. Thus, the rear end of the lever 106 is normally biased upwardly. Opposed to the spring 114 there is provided a solenoid motor device 116 whose piston 118 is linked to rear end of the lever. On actuation of the solenoid, the piston 118 is adapted to overcome the force of spring 114 and to pivot the lever 106 clockwise about pivot 108 consequently causing upward engagement of the forward terminal portion 112 with extension pin 110, thereby raising the plunger 22 upwardly through the die shell 18. A switch 120 (FIG. 1) is provided to permit operation of the solenoid 116 only when the turret is in position placing the die assemblies at their respective stations. The switch 120 is located directly below the position where wheel 26 comes to rest when the turret is accurately located and has a finger 122 which is depressed by the wheel.

The apparatus functions as follows. A bobbin of booked cigar patches 32 of the type described in our aforementioned copending application is mounted on arms 38, being supported at its axis 36. It is oriented so that the unwound porous web 34 will leave the roll at the rounded edge 68 of the suction box 44 to pass along its smooth undersurface, around roller 92 and up to bobbin core 94 to which it is fastened. Turning to FIG. 5 there is illustrated the electrical circuitry of the device connected to a source of power S and to a source of vacuum V. Motor 104 is connected through an on-off switch 124 to the source of power of intermittent operation. Fittings 64 and 86 are connected to the source of vacuum which is applied continuously to box 44 and intermittently through a suction valve 126 to box 48. The vacuum-entering fitting 86 and subsequently chamber 48 is, however, more intense than that coupled to fitting 64 even when only applied intermittently. Control of suction through fitting 86 is exercised by means of the electropneumatic transducer 90, which is connected to a multiple-switch relay 128. The relay 128 exercises on/off control over three separate circuits simultaneously. When the relay 128 is in the passive state, the positions of its three switches are as follows. One switch S-1, starting and stopping motor 104 is closed, causing the motor to run. A second switch S-2 controls the supply of energy to the suction valve 126 which determines the supply of vacuum to fitting 86 and thence to compartment 48. This switch S-2 is also normally closed, resulting in a constant supply of vacuum to this larger compartment. A third switch S-3 normally open is connected to the microswitch 120, which in turn is connected to solenoid 116 actuating the plunger 22. When the transducer 90 is operated by the application to its diaphragm of a vacuum of predetermined value being reached in box 48, all three of the switch systems are reversed and latched in that position, until unlatched as described below.

Thus, upon first supplying all services to the machine the motor 104 will cause the porous web to be pulled from the booked bobbing, which web will be pressed against the underside of box 44 by means of the air caused to enter the perforations by the constantly applied vacuum. It is important to notice that the point of contact between the booked roll 32 and the suction box 44 at edge 68 is such that suction is applied to the porous web before it leaves the roll. Thus, it is certain that the cigar patches interleaved between the two layers of porous web are under full suction control at the point of divergence, so that they maintain the stretch and oriented condition as booked on core 32 as they travel along the underside of box 44.

As the web progresses, patches P will be unwound and will move until the first reaches the vicinity of the second compartment 48. Further movement progressively closes the series of perforations 66 in the under surface of the compartment 48, gradually preventing the ingress of air, which in turn causes the vacuum to become more intense. As a result, more air tends to flow through opening 52 from compartment 46 which eventually will cause such a difference in pressure on the two sides of valve 54 that the valve 54 will close, isolating compartment 48 completely. Continued movement of the wrapper across the perforations 66 will eventually cover all of them, under which conditions the vacuum in compartment 48 will be substantially equal to the supply vacuum through pipe 86. The electropneumatic transducer 90 set to respond just below this maximum value, reverses all three switches of the relay 128 controlled by it. The motor 104 will stop, leaving the leading patch in the correct position above the die-receiving station 12, ready for transfer. Switch S-2 will open and the vacuum to the second compartment 48 will be cut off by means of its suction valve 126 which vacuum will rapidly decay, due to the semiporous nature of the patch, until the valve 54 is opened by the spring 60, permitting the lower suction in compartment 46 to enter compartment 48 to hold the patch in position for any length of time. Simultaneously, the third switch S-3 will close, permitting switch 120 to exercise control over solenoid 116 to raise the plunger 22 and cause head 20 to remove the patch as soon as it is ready.

Normally, the rate of arrival of patches to the receiving position or compartment 48 takes place at such a rate that the leading one arrives there before the cigar machine turret has finished its rotary movement from the preceding cycle and the patch will be caused to wait for a fraction of a second while the turret completes its movement. Upon such completion, the roller 26 of plunger 22 depresses switch 120 which energizes solenoid 116 causing the plunger 22 to rise, so that the top perforated face of head 20 contacts the patch held against the porous web above. The vacuum present inside the hollow perforated head 20 being more intense than that suction holding the patch against the porous web causes the transfer of the patch to the head 20, with the result that upon descent of the plunger as a result of the interruption of electrical current to solenoid 116 the patch is carried with it.

The descent of plunger 22 is effected by operation of a timing relay 130 connected to it which after a given period of time breaks the circuit of solenoid 116. The timer 130 is also in circuit with the transducer 90 additionally providing a signal to unlatch the relay system 128 associated with it. The timer is also connected to the cigar-making machine, to initiate one index of the turret, thus advancing the delivered patch to be processed by usual devices of the cigar machine.

That is, the patch is cut at the transfer station 14 where the transfer arm (not shown) removes it and places about the filler core as described in the aforementioned patents. Means for removal of the scrap material is provided as is also well known.

The unlatching of the relay system 128 associated with the electropneumatic transducer 90 results in a repetition of the series of events described, causing the whole machine to continue to feed patches and produce cigars as long as patches are present, automatically stopping when patches are not available.

It will be noted that this apparatus provides means for locating the patches in the correct delivery position no matter how their spacing may vary on the porous web, but the locating device shown is intended as an example only, other devices being available within the scope of this invention, such as a simple pneumatic device sensing the arrival of the patch by means of one small hole only, which hole would be closed as soon as the leading edge of the patch covered it. Dielectric devices are known which can sense the difference between the patch and the porous web, thus being adaptable to sense the arrival of the patch. Photoelectric devices capable of sensing the difference in color between the patch and porous web, using reflected light or on/off devices using transmitted light are very common and would be quite suitable, etc.

The apparatus described above is designed to provide the maximum economy by employing the comparatively high vacuum in compartment 48 for only part of the time, but it is self-evident that by permitting this vacuum to be used all the time, the valve 54 and the suction valve 126 employed to interrupt the vacuum supply could be dispensed with, simplifying the apparatus at the expense of increased running costs; or, the second compartment 48 together with its particular vacuum source could be dispensed with altogether if one or the other of the alternative locating devices mentioned above were employed to sense the arrival of the patch to the delivery position.

It will also be self-evident that the booked roll could easily comprise patches cut to size in all details instead of the slightly oversize ones described above. In this case the cutting dies 16, together with their associated cutting rollers would be eliminated from the cigar-making machine, leaving only the perforated plunger 22 on the die turret to handle the finished patch from the receiving station to the machine transfer station.

It is also proposed that the porous web be replaced by a porous endless band passing around roller 92, a roller in place of bobbin core 94 and a third roller at curved edge 68. Such an endless porous band is adaptable to feed an endless web of manufactured tobacco sheet or the like along the underside of vacuum box 44 to have pieces serially sheared from its leading edge to be picked up by perforated head 20 for processing as described.

The main description above relates to the provision of the patch booking roll comprising oversize wrappers which are trimmed to size on the cigar machine die turret. When this occurs, the cutting out of the finished wrapper will leave a small remainder surrounding the die, which remainder is held in place by suction applied via the holes in the suction box portions 20 and 22. To remove this remainder to permit automatic operation, scavenging apparatus, well known in the industry, must be employed, but should finished wrappers be fed, such a device would not of course be required.

The above description relates to the employment of a booked roll of patches comprising a porous web wound upon itself with the patches interleaved between the layers of web at random intervals. As an alternative, a similar porous web 132 could be employed with at least one of its edges pierced with a continuous series of equispaced sprocket holes. If, in booking the wrappers, they be inserted in the roll at uniform intervals, the delivery of the wrappers to the cigar machine from the roll may be synchronized by means of the sprocket holes in the porous web. This simplifies the feeding mechanism which functions as follows with reference to FIG. 4.

Roll 32 is mounted on axis 36 and pressed against rounded edge 68 by means of the spring device 42 as before. The suction box 40 has only one compartment 134 and is uniformly perforated as at 136 along its underside. The porous web 132 is unwound from the roll and passed along the underface of the suction box 40 and around sprockets 138, whose teeth engage the holes in the porous web. The end of the web is carried around and fastened to bobbin core 94 upon which it is wound. A slip clutch 140 is mounted on axis 96 and driven by crossed belt 142 and pulleys 144 by motor 104. The axis of sprockets 138 carries a single revolution clutch 146 of known construction which is also driven by sprockets 148 and chain 150 from motor 104 and which is controlled by a solenoid 152 which is energized at the appropriate time by the timer which has already been described.

When the machine is ready to run, continuous suction is applied to box 44 via fitting 64 and motor 104 runs continuously. Upon energizing solenoid 152, the single revolution clutch 146 is released and makes one revolution, causing the sprocket 138 to advance the porous belt a distance equal to the pitch of the wrappers on that belt which delivers the leading wrapper into the receiving station 12 immediately above the head 20 and plunger 22. Upon completion of this movement, a cam 154 mounted on the same shaft as the single revolution clutch 146 and porous belt sprockets 138 operates a switch 156 which is wired in series with switch 120 and makes possible the series of events for operating the apparatus. This results in the energizing of solenoid 116 (FIG. 2) causing the plunger 22 to rise so that it contacts the wrapper at the transfer station. As described above in connection with the first embodiment of this invention, the period during which the solenoid 116 is energized is controlled by an electrical timer which is set to cause the solenoid 116 to be deenergized after it has risen so that consequently the plunger 22 descends, carrying the wrapper with it. As before, the timer provides two additional signals, one to operate the existing cigar machine apparatus permitting the die turret to make one index and the other to energize solenoid 152 (FIG. 4) repeating this series of events, bringing the new leading wrapper into the transfer station. Thus, the machine will run continuously. A suitable detector (not shown) such as a feeler finger dropping into a hole provided in the end of the porous web may be used to indicate the end of the wrapper supply, and by means of a microswitch operated by the dropping finger isolate solenoid 152 so that the cycle of events is terminated.

It will now be apparent that the present invention provides a method and apparatus for automatically feeding patches of tobacco leaf or foil to a cigar-making machine and that the various objectives and advantages previously enumerated have been fully met. Various modifications and application of the numerous invention concepts will occur to those skilled in the art. Accordingly it is intended that the present specification is by way of illustration only and that the inventions taught herein are to be limited only by the scope of the appended claims.

What I claim is:

1. Apparatus for automatically feeding patches of tobacco wrapper or binder to the infeed mechanism of a cigar-making machine comprising, a flexible porous web wound upon itself in layers to form a roll to support a plurality of spaced, stretched and oriented patches serially arranged between various layers of the roll, means for separating the layers of said roll, air means acting through said flexible porous web for maintaining said patches in stretched spaced oriented position on a surface of the flexible porous web of the layer being separated and means for successively removing the leading one of said patches from said surface and for transferring said leading patch to said infeed mechanism.

2. Apparatus for automatically feeding successive patches of tobacco wrapper or binder to the infeed station of a cigar-making machine said patches being supplied in serial spaced and oriented fixed relative position within the layers of a wound roll of porous supporting web comprising a hollow box having a substantially porous undersurface, suction means

connected to said box to draw air through said undersurface, means for unwinding and guiding said web across the undersurface of said box, said suction means acting to maintain said web and the patches thereon in said fixed relative position, means responsive to the position of the leading one of said patches for arresting said unwinding means, transfer means for removing said leading one of said patches and delivering the same to the infeed mechanism of said cigar machine, and means for reactivating said unwinding means in response to the transfer of the leading one of said patches to effect successive operation.

3. The apparatus according to claim 2 wherein said infeed mechanism for said cigar machine comprises a receiving station therein, and wherein said transfer means comprises a reciprocating plunger mounted within said station, said plunger being substantially hollow and having an outer porous surface conforming to the shape of the tobacco patch, a source of vacuum connected to said plunger and means for reciprocating said plunger on arrest of said web to remove said leading one of said patches therefrom and transferring the same to said infeed station.

4. The apparatus according to claim 3 wherein said receiving station is located within a revolving turret adapted to further move said transferred patch away from said web and into said cigar machine.

5. The apparatus according to claim 3 wherein the means for arresting the unwinding of said web is responsive to changes in vacuum level within said box caused by the location of the leading patch on said undersurface.

6. The apparatus according to claim 5 wherein said box is divided into two chambers arranged serially relative to the direction of movement of said web, the forward chamber being provided with a porous undersurface having a contour substantially equal to the contour of said patch and arranged so that the leading patch is maintained in register on said web and includes a pressure sensitive transducer sensing the change of pressure within said forward chamber on registration of said patch and producing a signal for arresting the unwinding means.

7. The apparatus according to claim 3 in which the means for arresting the unwinding of said web is a dielectric sensitive transducer generating a signal upon contact with said leading one of said patches.

8. The apparatus according to claim 3 in which the means for arresting the unwinding of said web is a photosensitive device generating a signal upon the positioning of said leading one of said patches.

9. The apparatus according to claim 3 wherein said means for unwinding said web includes means for advancing said web at fixed intervals.

10. The apparatus according to claim 9 wherein the patches of tobacco wrapper or binder are arranged on said web at constant intervals corresponding to the intervals of advancement.

11. The apparatus according to claim 3 including means for controlling the relative level of suction within said box and said plunger to permit transfer of said leading one of said patches in stretched oriented position.