June 18, 1940. S. CLAUSEN 2,204,980

HIGH SPEED CIGAR MACHINE

Filed April 29, 1936 2 Sheets-Sheet 1

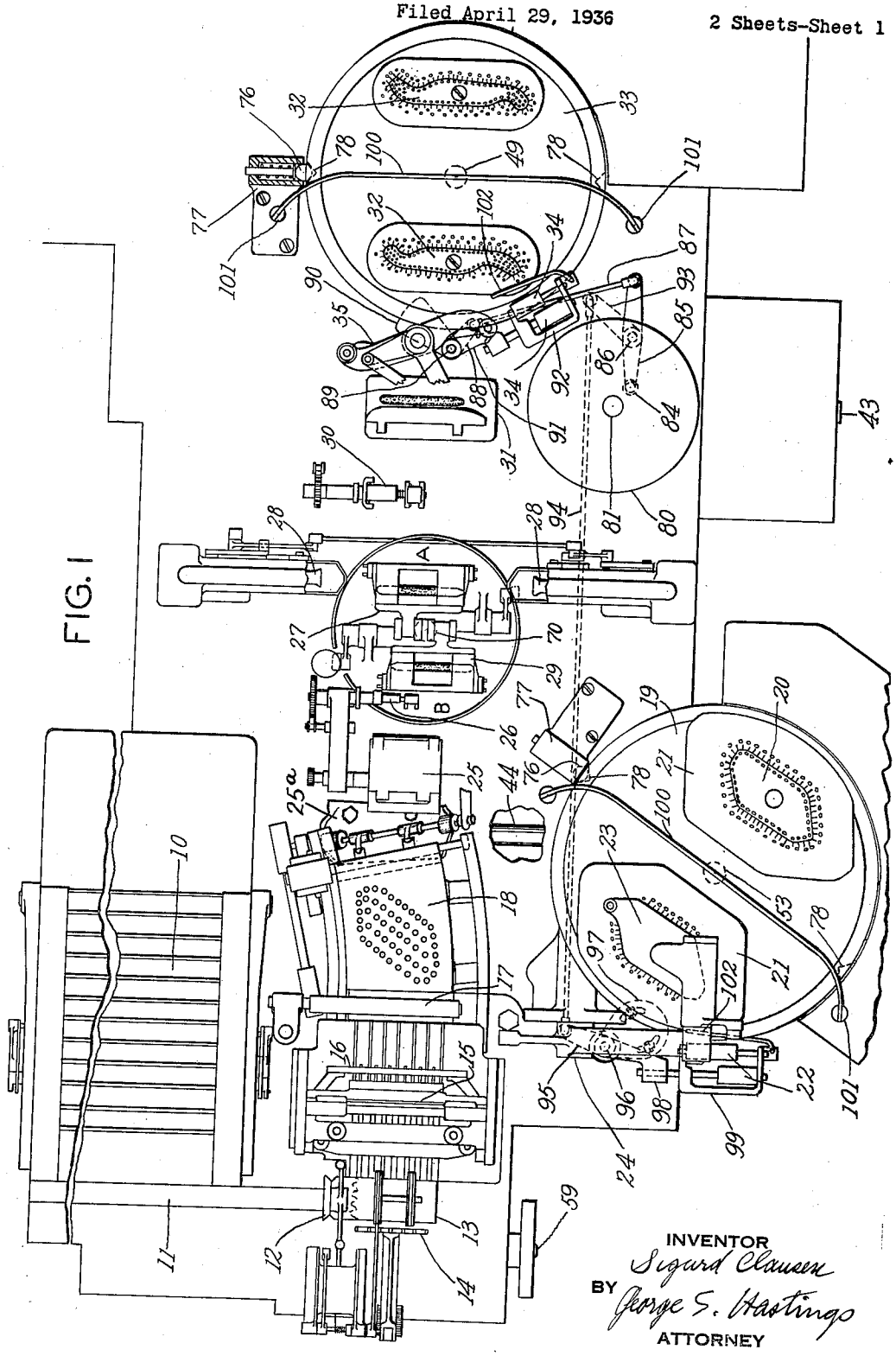


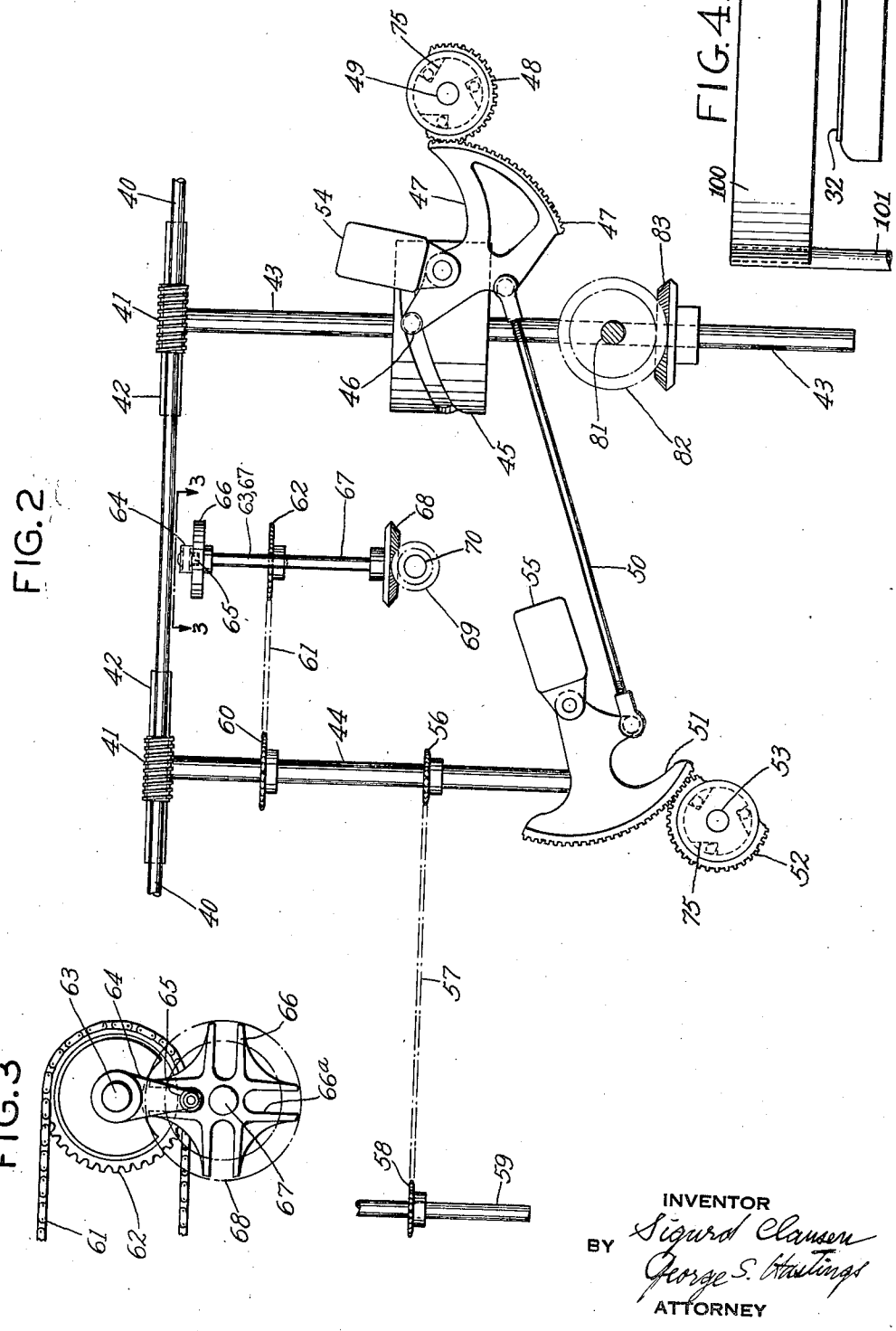
FIG. 1

INVENTOR
Sigurd Clausen
BY George S. Hastings
ATTORNEY

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HIGH SPEED CIGAR MACHINE

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INVENTOR
Sigurd Clausen
BY George S. Hastings
ATTORNEY

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HIGH SPEED CIGAR MACHINE

Sigurd Clausen, Brooklyn, N. Y., assignor to International Cigar Machinery Company, a corporation of New Jersey

Application April 29, 1936, Serial No. 76,933

10 Claims. (Cl. 131—102)

This invention relates to cigar machines, more particularly to a high speed machine which will produce cigars at higher speeds and less cost than prior machines.

It has been customary to run existing machines at a speed commensurate with the speed and skill of the operators, so that the speed of the machines is governed by the ability of the operators. In normal machine operation the output is about eight per minute. While it is possible to speed up these machines, and make them capable of producing more cigars per minute, it has been found that the operators cannot furnish binders and wrappers with sufficient rapidity, and that cigar bunches undergoing shaping do not have adequate time in the shaper devices, and are not so perfectly formed as when the machines are run slower. Hence, although the machines are capable of higher output, the net result when run faster is approximately the same output as when the machines are run at usual speed.

In the present invention, it has been found by the provision of a high speed machine having a plurality of binder cutting and wrapper cutting devices, and a plurality of shaper elements, all operating in synchronism, that it is quite possible to provide a machine with a normal output up to fifty percent above that of existing machines.

In this machine each of the binder and wrapper forming devices may take the form of rotatable members or turrets of duplex type, that is in which two or more suction leaf supporting beds have cutting dies thereon. These turrets are properly indexed so that when one die is presented to an operator for serving with a leaf, the other is delivering its cut product either to the binder carrier for transport to the rolling table, or to the wrapper carrier for transmittal to the wrapping rolls. Referring to Fig. 1, it will be observed that the die of each rotatable member adjacent each operator is free and unencumbered insofar as mechanism for forming a binder or wrapper is concerned. Thus any possible element of fear from injury by mechanism such as cutting rollers or the wrapper or binder transfer arm or any interference with this mechanism is eliminated, and the operators may serve each die with leaves just as soon as it moves to receiving position. It is evident, therefore, that by having this arrangement a greater number of leaves are fed more expeditiously to the cutting means and to the bunch forming and wrapping mechanism of the machine than was possible heretofore where it was necessary after serving a leaf to wait for the cutting rollers to oscillate across the die and the transport arm to move down to remove a cut leaf before the next could be served.

It is apparent, therefore, that a higher output is possible due to the above mentioned devices. To provide satisfactory bunches for wrapping, a shaping device of the type shown in my prior Patent No. 1,945,022, granted January 30, 1934, may be used. This type of shaper which comprises a turret having a plurality of bunch receiving pockets allows each bunch to have adequate time for shaping prior to transfer to the wrapping station.

It is necessary that the two turrets and shaping turret work together in timed relation if there is to be satisfactory operation and best production, and means have been provided for synchronizing the operation of the three whereby this result is obtained.

It is, therefore, an object of this invention to provide a cigar machine which will produce cigars at higher speeds than prior machines are capable.

It is further an object to provide a cigar machine having a plurality of rotating members, each having a plurality of dies for forming binders and wrappers, in combination with a turret having a plurality of shaping pockets for properly shaping bunches fed thereto.

It is an additional object to provide a machine which has a plurality of devices for forming binders, a plurality of devices for forming wrappers and a member having a plurality of shaping members, all of which are synchronized for joint operation for high speed cigar production.

It is a further object to provide means for synchronizing the operations of the binder and wrapper forming turrets, and the bunch shaper turret, whereby they may perform their designed functions in proper timed relation.

It is an additional object to provide a high speed cigar machine which has leaf cutting dies in which each die at the time of serving is free from any operating mechanism, thereby allowing greater accessibility thereto for this operation.

An additional object is to provide each of the binder and wrapper forming turrets with cutting members constructed to operate in synchronism with the motion of the turrets, and simultaneously move across the respective binder and wrapper dies presented at the cutting position,

and to move back before movement of said dies from that position.

A further object is to provide guards for either or both turrets, which will tend to prevent operators from moving their hands across the tops of the turrets into the range of the cutting members. These guards may be used alone with effective results, or may be used in conjunction with the conventional cutting member carriage incapacitating devices.

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 then set forth in the claims hereunto appended.

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 multiplex cigar machine;

Fig. 2 is a plan view of the main drive of the machine;

Fig. 3 is an enlarged end view of the Geneva drive taken on line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary elevational view showing the relation of a turret guard to a turret.

Referring to the drawings: The filler feed of the particular machine illustrated herein may be of the type disclosed in the patent to W. B. Bronander, 1,740,571, and may be equipped with a feed-in conveyor 10 of the type shown in my copending application Serial Number 76,932; filed April 29, 1936, for a Cigar machine filler feed, although any other suitable feed may be used satisfactorily. In the feeding device such as disclosed in the above mentioned application, the tobacco leaves constituting the filler for the cigar bunches are placed by an operator lengthwise across each of the pockets of the feed-in conveyor 10. The conveyor advancing and delivering the leaves to a cross feed belt 11 which moves the same from the conveyor at a right angle to its previous line of travel, carrying the layer of tobacco to the cutter unit 12. The layer of tobacco is then acted upon by the cutter which severs a desired length, equal to that of a bunch, from the column of tobacco, each cut forming the tuck-end of one length and the head-end of the next, thereby eliminating any waste of tobacco. A reciprocating platform 13 which is in its upposition when the cutter acts upon the tobacco, receives the cut charge and then descends whereby the charge is delivered to a position in level with a cam actuated pusher 14 which engages the cut bunch section and pushes the same from the platform in a right angle to its previous line of travel. The forward movement of the pusher 14 pushes the tobacco between upper and lower charge guides, set at the proper and desired vertical distance for a bunch charge, against a pivoted measuring finger (not shown) of the construction shown in the patent to V. G. Hanson, 1,791,558, February 10, 1931, which also moves forward until the predetermined length of charge is attained, in the same manner as disclosed in my above mentioned copending patent application. The charge arrested between the rake and measuring finger is now severed from the column by a cam operated knife 15, the cut bunch section then being conveyed under suitable guide fingers, by a reaper arm 16 to a filler transfer 17 of the type shown in the patent to R. E. Rundell, 1,839,192, which delivers the charge to a rolling apron 18.

The binder turret 19 is provided with die blocks 20 of a construction well known in the art and may be similar to those shown in my prior Patent No. 1,888,788, issued November 22, 1932, except that dies conforming to binder shape are used. Therefore, a brief description of the same is deemed sufficient. When the leaf is being served to the die 20, part of the suction in said die and shell 21 remains shut-off so as to enable the operator to shift the leaf for proper adjustment, but as soon as the turret commences to turn, full suction is turned on so that the leaf is firmly held in place while the turret turns one-half of a revolution. In this new position of the served die, the block 20 is lowered slightly below the knives so that a sharp and clean cut will be secured when the cam actuated oscillating cutting rollers 22 act upon the leaf. The rollers 22, having cut a binder section from the leaf, then retreat to their starting position and block 20 rises into engagement with the binder carrier, and the binder is removed. At this same time the opposite block and die are being served with another leaf. When in the latter position, the suction in the die is cut off so that the suction in the carrier 23, which is of the type shown in the patent to R. E. Rundell 1,543,874, can lift the binder from the die, but the suction in the shell 21 remains to hold the binder scrap on the shell until shortly before the die returns to the serving position, so that the operator can remove this scrap as the die enters into the latter position in which suction is again turned on for serving the next leaf.

When the binder carrier receives the leaf, the carrier by means of a cam actuated arm 24 is swung from its leaf receiving station to the rolling apron 18 of conventional design and operation, upon reaching the apron the suction in carrier 23 being cut off so that the suction applied to the apron can remove the binder from the carrier and retain it thereon. The binder thus retained is then rolled around the measured charge producing a cigar bunch of desired shape. The bunch thus formed is transferred by a transfer device 25a which may be of the type shown in Patent No. 1,786,609 granted to J. F. Halstead to a rolling device 25 by which it is evened up and softened. A transfer arm 26 then takes the bunch to a shaping device which comprises a rotatable turret having shaping jaws forming shaping pockets. In Fig. 1, a turret having two sets of jaws 27 and 29 is shown. The turret may be of the same construction as disclosed in my prior Patent No. 1,945,022, granted January 30, 1934, in which bunches placed in the pockets are pressed into the desired cigar shape and have their ends trimmed. The bunch before being inserted in the shaper jaws 27 at station A is acted upon by revolving reciprocating bunch locators 28 which position each bunch correctly with reference to the bunch shaping devices. The bunch thus held in the shaper jaws 27, the turret turns 180 degrees to station B and brings the shaper jaws 29 into the position previously occupied by shaper jaws 27 where the next bunch is treated by locators 28, and then placed in jaws 29. After being loaded jaws 29 are rotated 180° to B position while jaws 27 with the first mentioned bunch are rotated back to position A where they are opened so that a transfer 30 may engage the shaped cigar bunch, and deliever it to a wrapping device 31 in which a wrapper cut on one of the dies 32 is applied to it thereby forming a completed cigar. In this manner, as in the patent above referred to, each bunch is held in its respective end crimping or

shaping jaws for a full revolution of the turret.

When a leaf has been served to one of the wrapper dies 32 the turret 33 turns one-half of a revolution bringing the served die to the wrapper transfer position. In this position cam-actuated oscillating cutter rollers 34 of the general type shown in the patent to R. E. Rundell, 1,543,874, are swept over the die and cut-out a wrapper section from the leaf; having performed their duty the rollers return to the starting position. The die then rises and delivers the wrapper to the wrapper carrier 35 which transports the same to the wrapping device 31. Since the up-and-down movement of the dies 32 and suction control of the same are fully disclosed in my prior Patent 1,888,788, a further description of the same is deemed unnecessary. It is understood that binder and wrapper cutter rollers of the type disclosed in the above mentioned patent may be used in place of the oscillating type.

Referring to Fig. 2, a motor through suitable gearing (not shown) drives a shaft 40 which is equipped with worm gears 41 driving worm wheels 42 mounted on the shafts 43 and 44 respectively. A drum cam 45 mounted on shaft 43 actuates a cam roller 46 which is carried by a gear sector 47 in mesh with a gear segment 48 on the wrapper die turret shaft 49. Sector 47 by means of a rod 50 connects and drives a sector 51 which is in mesh with a gear segment 52 on the binder die turret shaft 53. In this manner the wrapper and binder turrets are revolved one-half of a turn. The sectors 47 and 51 are pivotally mounted on a stud carried by the brackets 54 and 55, respectively, attached to the bed of the machine. Shaft 44 carries a sprocket 56 driving, by means of a chain 57, a sprocket 58 mounted on the filler feed cam shaft 59. A sprocket 60, also carried by shaft 44 by means of a chain 61 drives a sprocket 62 mounted on a shaft 63 (Figs. 2 and 3), the latter also carrying a Geneva arm 64 equipped with a roller 65 engaging the runways 66a of a Geneva wheel 66. The Geneva wheel 66 is mounted on a shaft 67 which also carries a bevel gear 68 meshing with a bevel gear 69 attached to the crimper turret shaft 70. The turning of shaft 63 permits the roller 65 to engage the Geneva wheel runways and thereby revolve the Geneva wheel one-quarter of a turn. This intermittent turning of shaft 70, by means of gears 68 and 69 intermittently rotates the turret shaft one-half revolution.

The segments 48 and 52 are equipped with ball clutch members 75 which drive their respective shafts in one direction only. At the completion of one-half revolution of the binder and wrapper turrets, a spring tensioned ball 76, supported in a bracket 77, is forced into engagement with either of two diametrically opposite V slots 78 provided in said turrets thereby stopping overrunning of the same.

The binder and wrapper cutting rollers 22 and 34, respectively, are actuated in synchronism by means of a cam 80 mounted on a vertical shaft 81. Shaft 81 is equipped with a bevel gear 82 meshing with a bevel gear 83 mounted on cam shaft 43. The motion thus imparted to cam 80 actuates a cam roller 84 which is carried by an arm 85 mounted on a pivot 86, the other end of arm 85 supporting a rod 87 connecting an arm 88 fixedly mounted on a stud 89 supported in a bracket 90. An arm 91, clamped on stud 89, carries the cutter roller frame 92 which receives oscillating motion from the cam, whereby the rollers 34 are swept over the die 32 cutting out a wrapper section. An arm 93 clamped on pivot 86 supports one end of a rod 94 connecting an arm 95 fixed on a pivot 96 which is supported in a bracket 97. Pivot 96 supports an arm 98 carrying the binder cutter roller frame 99 which is adjustably fastened thereon (Fig. 1) and receives oscillating motion from the cam 80, whereby the rollers 22 are swept over the die 23 cutting out a binder section.

The operator having served the die sometimes continues to stretch or adjust the leaf when the turret is in motion. This may result in injury of the operator's hands if they are not withdrawn before the cutting rollers sweep over the die. To eliminate this possibility each of the turrets 19 and 33 is equipped with a guard 100 which, in the embodiment shown, consists of a vertical plate supported in the upper slotted portions of rods 101. The guards are so positioned that there is clearance between said guards and the dies, thus the turret in turning carries the dies under the guard and the latter will direct the operator's hand away from the die. Each of the cutter frames 92 and 99 is provided with a safety lever 102, of conventional construction, which serves to stop the machine and incapacitate the cutter roller carriage, if for some reason the operator should reach over guard 100 to manipulate the leaf when the same is in cutting position.

While I have herein shown and described one embodiment of my invention, I wish it to be understood that I do not confine myself to all the precise details of construction herein set forth by way of illustration, as modification and variation may be made without departing from the spirit of the invention or exceeding the scope of the appended claims.

What is claimed is:

1. In a cigar machine, the combination with a plurality of leaf supporting suction beds having binder cutting dies, of mechanism for successively moving said beds into delivery position, means located adjacent the path of said beds and moving over the die at delivery position and cooperating with said dies successively to cut binders from leaves carried thereon to said delivery position, a bunch rolling table, means to remove successive binders from said dies at said delivery position and position them upon said table for rolling with filler tobacco into a bunch, a shaper device, and means for transferring bunches from said table into said device, said mechanism including a rotary turret whereon said beds are fastened with their dies disposed so that they will successively lie in normal binder-cutting position at said delivery position.

2. In a cigar machine, the combination with a plurality of leaf supporting suction beds having binder cutting dies, of mechanism for successively moving said beds into delivery position, means located adjacent the path of said beds and cooperating with said dies successively at said delivery position to cut binders from leaves carried thereon to said delivery position, a bunch rolling table, means to remove successive binders from said dies at said delivery position and position them upon said table for rolling with filler tobacco into a bunch, a shaping device having a plurality of pockets, means for rotating said shaping device, and means to transfer bunches from said table into the pockets of said shaping device, said mechanism including a rotary turret whereon said beds are fastened with their

dies disposed so that they will successively lie in normal binder-cutting position at said delivery position.

3. In a cigar machine, a leaf cutting turret provided with a plurality of leaf cutting dies, a device adjacent said turret and cooperating with said dies for cutting sections from leaves placed upon said dies, stop mechanism carried by said device for incapacitating said device if an obstruction contacts said mechanism, and means for moving said turret to a plurality of positions, including a leaf serving and cutting position.

4. In a cigar machine, a leaf cutting turret provided with a plurality of leaf cutting dies, means adjacent said turret and cooperating with said dies on said turret for cutting sections from leaves placed upon said dies, means to move said dies to serving and cutting positions, and guard means positioned across said turret and adapted to inhibit access to a die at cutting position when another of said plurality of dies is being served with a leaf and minimize the prospect of danger occurring from placing of the attendant's hand in the range of action of said leaf-cutting means.

5. In a cigar machine, a turret provided with a plurality of cutting dies, a device positioned adjacent said turret and coacting with said dies for cutting leaf sections from leaves held on said dies, stop mechanism for incapacitating said device during the presence of an obstruction in the path of said device, and means for moving said turret through a plurality of positions, including leaf serving and cutting positions.

6. In a cigar machine, the combination with a bunch rolling device, of a rotary binder cutting mechanism, said mechanism including a plurality of spaced suction dies, and cutting rollers adapted to cooperate with each of said dies in succession to sever leaf sections from leaves placed on said dies, means for transferring binders to said bunch rolling device, a rotary shaper turret, means for transferring bunches from said rolling device to said turret, a wrapping station, a rotary wrapper forming turret, cutting means cooperating with said turret, and mechanisms for transferring bunches from said shaping turret, and wrappers from said forming die turret to said wrapping station for formation into cigars, and means for synchronizing the movements of the several members of the machine.

7. In a cigar machine, the combination with an intermittently rotating turret having opposite serving and delivery stations and provided with a plurality of binder dies, a member moving to and fro over said dies successively at said delivery station to sever binders from tobacco leaf sections spread thereon at the serving station, and a binder transfer arranged adjacent said delivery station and remote from said serving station to move down upon the die at delivery position and pick up binders following the severance thereof by said member and transport them to bunch rolling position.

8. In a cigar machine, the combination with an intermittently rotating turret having opposite serving and delivery stations and provided with a plurality of binder dies, a member moving to and fro over said dies successively at said delivery station to sever binders from tobacco leaf sections spread thereon at the serving station, and a binder transfer arranged adjacent said delivery station and remote from said serving station to move down upon the die at delivery position and pick up binders following the severance thereof by said member and transport them to bunch rolling position, said transfer including a swinging arm overlying said member and mounted on a horizontal axis adjacent said remote side of the turret and a binder carrier mounted on said arm to be carried thereon from a position overlying the binder die at the delivery station to the bunch rolling position.

9. In a cigar machine, the combination with an intermittently rotating turret having diametrically opposite serving and cutting stations and provided with a plurality of wrapper cutting dies so arranged thereon that their wrapper overlap cutting sides will lie adjacent its periphery at the serving station, a member moving to and fro over the die at the cutting station, a set of cutting rolls on said member arranged to coact with the die at the cutting station to sever a wrapper, and mechanism for moving said member to and fro across each die while it is at said cutting station to sever wrappers.

10. In a cigar machine, the combination with a bunch rolling device, of a rotary binder cutting mechanism, said mechanism including a plurality of spaced suction dies, and cutting rollers adapted to cooperate with each of said dies in succession to sever leaf sections from leaves placed on said dies, means for transferring binders to said bunch rolling device, a shaper, means for transferring bunches from said rolling device to said shaper, a wrapping station, a rotary wrapper forming turret, cutting means cooperating with said turret, and mechanisms for transferring bunches from said shaper, and wrappers from said forming die turret to said wrapping station for formation into cigars, and means for synchronizing the movements of the several members of the machine.

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