This invention relates to cigar machines and more particularly to improved mechanism chiefly employed in conjunction with a charge compression chamber for cutting measured bunch charges of tobacco in a more efficient and practical manner.

This application constitutes a division of my co-pending application, Serial No. 370,835 filed December 20, 1940, for Detachable transfer pocket, now Patent No. 2,344,769, issued March 21, 1944, and the invention relates further to cigar machines of the general type shown in my co-pending application, Serial No. 193,244 filed March 1, 1938, for Feed for cigar bunch machines, now Patent No. 2,306,381, issued December 29, 1943, and relates to improvements therein and especially in novel charge cutting mechanism for use with such cigar machines.

In the operation of a cigar machine of this type, from time to time, it is necessary to remove the bunch charge transfer in order to make adjustments or to replace the knife or remove the same for sharpening, and also to make adjustments and repairs on the bunch charge transfer itself. Heretofore it has been necessary to tear down a part of the machine in order to provide access to parts being adjusted, repaired or replaced, and hence much time and labor have been consumed carrying out these operations. According to my invention, however, I have eliminated all unnecessary labor and tearing down of the machine and, therefore, have provided a machine in which adjustments to the setting of the bunch charge transfer, repairs and replacements thereto can be rapidly carried out and in which the knife is readily accessible for repair, replacement or sharpening with a minimum of effort and loss of time.

I have found that a better cutting action can be obtained if a relatively thin knife be used in conjunction with the end of the charge compression chamber and ledger plate, and that the knife can also be relatively short in length and somewhat bowed because the walls of the compression chamber will tend to flatten the knife and effect a scissors-like action in separating a charge of tobacco positioned in the bunch charge transfer from the tobacco in the charge compression chamber.

It is, therefore, an object of my invention to provide an improved charge cutting mechanism.

My invention also consists in the provision of a novel charge cutting mechanism employing a relatively thin knife preferably bowed about its longitudinal axis which results in better separation of bunch charges.

It is an added object of my invention to provide a novel and improved charge cutting mechanism capable of effecting a cleaner and more efficient cutting action with substantially complete elimination of “after-drag” or pulling of tobacco by the knife between the knife and ledger plate.

It is also an object of my invention to provide an improved charge cutting mechanism, and one which is especially useful in cutting cigar bunches used in making relatively small cigars.

It is also an object of my invention to use separate motions in operating the charge cutting knife and the bunch charge transfer pocket in order to obtain better control in the formation of bunch charges and make possible the use of shorter and thinner knives for cutting charges. Association of operating mechanisms means that a thinner knife can be used and that it can be clamped closer to the cutting edge and still have the rigidity needed.

It is a further object of my invention to form the front edge of the charge compression chamber with a taper for coating with a thin, bowed charge cutting knife and to provide preferably tapered blocks, at each end of the chamber for flattening the knife as it moves into charge cutting position.

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

Figure 1 is a partial front elevation of the machine showing the improved manner of mounting the charge transfer and also the mechanism for actuating said transfer and knife;

Figure 2 is a partial side elevation of the mechanism shown in Figure 1, showing the cams for operating the charge transfer and knife;

Figure 3 is a sectional detail view taken from line 3—3 of Figure 1;

Figure 4 is a detail view showing a portion of the knife and one of the guide blocks situated at each end of the knife;

Figure 5 shows the knife in section at an intermediate cutting position;

Figure 6 shows the knife in section in its lowered position; and

Figure 7 shows a further view of the cams em-
ployed for operating the knife and transfer pocket mechanisms.

Referring to the drawings which show a preferred form of my invention, the tobacco charge transfer, designated generally T, consists of a holder or frame 10 (Figures 1 and 3) so constructed as to form end walls 11 of a charge receiving pocket, and also carry plates 12 and 13 forming the upper and lower walls of the pocket. A hub 14, of holder 10, supports a slidable rod 15 carrying, as a charge ejecting plunger, plate 16 serving as the rear wall of the pocket much in the manner of that shown in my above referred to Patent No. 2,902,131.

The holder 10, at its ends, is equipped with bearings 17 and 18. Bearing 17 is provided with an open end socket or recess 19 adapted to fit over and cooperate with the ball shaped end 20 of a stud 21 loosely mounted in a hub 22 projecting from a bearing 23 of a cross frame 24. Open slots 25 in bearing 17 serve to engage the protruding ends of a pin 26 mounted in the ball end 20 of stud 21. The protruding ends of stud 26 preferably have flat surfaces (not shown) adapted to be engaged by the ends of set screws 28 and 29 (Figure 1) supported by bearing 17 for a purpose described hereinafter. The stud 21, when properly mounted, is held from moving axially in hub 22 by means of a collar 30 and an arm 31 located at the outer end of hub 22 (Figure 1).

The bearing 18 of holder 10 also has an open end socket 32 which may be similar to that in bearing 17 and is adapted to receive the ball shaped end 33 of a stud 34 loosely mounted in hub 35 extending from a bearing 36 of a frame 37. The bearing 18 is provided with an open end slot 37 engaging the projecting ends of a pin 38 mounted in the ball end 33 of stud 34. The stud 34 is held in operative position in hub 35 by means of collars 39 and 40 located at each end of the hub 35.

It will be seen that excess wear on the ball ends of studs 20 and 33 is prevented by reason of the manner in which the transfer T is supported for rotation on the studs. The ball shaped ends 20 and 33, respectively, act as self-aligning bearings and allow some movement between the studs 21, 34 and the recesses 19 and 31 in the frame 10, in order to locate the transfer pocket properly with respect to the charge compression chamber 45, and allow adjustments to be made to raise and lower the transfer pocket relative to the lower wall 61 by means of screws 28 and 29 which bear against the ends of pin 26. Actual turning of the transfer pocket from horizontal charge receiving position to and from vertical discharging position is effected by the studs 21 and 34 through the pins 26 and 38 engaging the slotted portions 25 and 37, respectively, so that the studs 21 and 34 act as journals for the charge transfer T in hubs 22 and 35, respectively.

With the transfer pocket mounted in this manner, it may be readily dismounted from the machine for cleaning purposes or whenever it may be necessary to remove it to get at different part of the machine for purposes as mentioned hereinafter. This is accomplished by loosening a set screw 41 which secures collar 39 to stud 34.

The operator then grasps the collar 40 and pulls it axially in hub 35, whereupon the ball shaped end 33 and pin 38 move out of bearing 18, and the transfer pocket is free to be disengaged from the ball end 20 of the stud 21. The screws 28 and 29 are set so as to engage the ends of pin 26 but still are free to permit slipping the pocket in and out of engagement with the ball and socket arrangement.

The measured tobacco charges are delivered to a magazine 45 (Figure 3) in the same manner as disclosed in my above referred to co-pending application, wherein a reciprocating plunger 46 of the usual construction advances the leading end of the tobacco column into the transfer pocket. With the tobacco charge C delivered in said pocket, a knife 47, by suitable means presently to be described, descends and cuts the tobacco charge thereby separating it from the tobacco in the magazine.

Referring to Figures 2 and 3, it will be seen that the charge cutting knife and charge transfer are operated independently of each other so that after the knife has cut a charge deposited in the charge transfer, the charge transfer is lowered, usually a greater distance than the stroke of the knife, to discharge the charge into bunch rolling mechanism.

Knife 47 is carried by a depending arm 48 of a tie bracket or cross head 49 secured to the upper ends of vertical rods 50 which are guided for movement in sleeves 61 (Figures 1 and 2) supported by the table 52 of the machine. As a result of the fact that the knife has independent movement, it can be made much shorter with respect to vertical movement since its limits are bounded by the upper end of the charge compression chamber 45 and the bottom of theledger plate 61, which may be fixed to the bottom wall 42 of the chamber and forms a part thereof as shown in Figure 3. The knife is clamped in cutting position by a cross bar 53 detachably supported by arm 48 by screws 43. The lower ends of rods 50 are secured to a bracket 54 (Figure 1) which is provided with a stud 55 supporting one end of a link 56 connecting to a cam lever 57 (Figure 2) mounted on a fulcrum shaft on the machine (not shown). Cam lever 57 is equipped with a cam roller 58 engaging in a cam track 59 of a cam 60 mounted on a shaft 60 suitably supported by frames of the machine (Figure 7).

After the knife has been moved downwardly its full stroke past upper plate 42a of the magazine 45 to cut through the charge, it remains in this position until after the charge transfer has moved from charge receiving position to discharging position for delivering the charge C to the rolling apron of the machine (not shown) and returned to its starting position ready to receive more tobacco from the charge compression chamber whereupon the knife 47 ascends to its upper limits and dwells.

The knife 47 is preferably mounted at an angle with respect to ledger plate 61 (Figure 3) in order to insure better cutting of the tobacco charge due to the more positive shearing action which effects cleaner and more efficient cutting with practically complete elimination of "after cut", sometimes experienced in the use of thick knives, especially in the formation of small types of cigars due to the movement of the cutting edge of the knife upon the ledger plate. This means that most of the charges are produced with my novel cutting mechanism, and hence fewer cigars are rejected.

At each end of the ledger plate 61 are blocks 62 having inclined surfaces 63 adapted to engage the ends of the knife 47 when it is in its up position (as shown in Figure 3) with its ends engaging the blocks 62 so that at all times the knife will be guided properly with respect to
ledger plate 61. In order to provide for better shearing action, I prefer to bow or curve knife 47 (as shown in Figure 5) because as the knife descends with its ends bearing against blocks 62, the cutting edge is guided into cutting position adjacent the ledger plate 61 and due to the joint between the edge of the knife and the ledger plate, the knife is flexed so that it becomes straight and bears against the full length of the ledger to insure better cutting of tobacco with a positive shearing action. It will be seen, therefore, that I have provided a thin knife which is self-sharpening and of sufficient rigidity to function with a scissors-like action against a ledger plate in such a manner that it is self-sharpening and also has practically no tendency to flex away from the ledger plate. This positive scissors-like shearing action practically eliminates dragging and tearing of the tobacco during the cutting of the compacted tobacco extending from the charge magazine into the charge transfer.

The knife 47 is provided with elongated slots 64 (Figure 1) which permit it to be adjusted properly and also provide means for readjusting the knife from time to time to compensate for wear of the beveled cutting edge. The bracket 49 is equipped with set screws 65 adapted to bear against the upper edge of the knife and keep it in adjusted position.

With the tobacco charge C lodged in the transfer, it is now ready to be actuated in order to deliver the charge to the bunch rolling apron of the machine (not shown). This is accomplished by a cam 66 (Figure 2) having a cam track 67 engaging a cam roller 68 carried by a cam lever 69, the latter supporting one end of a rod 70 connecting to an arm 71 secured to a pivot shaft 72 of the machine. The shaft 72 at its other end carries another arm the same as 71 (not shown), each of said arms supporting one end of a rod 73 connecting to their respective bearings 74 and 75 of bracket 24 (Figures 1 and 2) sliding on the vertical rods 50.

Mounted upon the bed 52 of the machine is a bracket 77 provided with a stationary cam track having a horizontal part 75 and a vertical part 76. As shown in Figures 1 and 2, arm 31 is provided with a cam track portion 75 and 76 so that when bracket 24 descends the cam follower 74 moves from the horizontal track portion 75 into the vertical track portion 76 and in so doing the transferring roller 32 is swung 90° from horizontal position to vertical position, as shown in dotted lines in Figure 3. By means of pins 25 and 30, which couple the ball shaped ends of studs 21 and 34 to the transfer pocket 71, the studs 21 and 34 act as journals turning in hubs or bearings 22 and 35, respectively, as described heretofore.

The bracket 24 carries on a stud 78 carrying a lever 79 equipped with a roller 80 normally riding against the face 81 of bracket 77, the roller 80 being held in engagement with the face by means of a spring 82 (Figure 3) located in a housing 83 of bracket 24. As bracket 24 approaches its lowest position, the roller 80 is depressed against the plunger rod 15 causing the plunger 16 to expel the tobacco charge into the loop of the rolling apron of the machine.

The invention above described may be varied in construction within the scope of the claims, for the particular device, selected to illustrate the invention, is but one of many possible concrete embodiments of the same. It is not, therefore, to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. In a cigar machine, a bunch charge transfer, means for moving said transfer to and from bunch charge receiving and discharging positions, a tobacco compression chamber, guide blocks adjacent the ends of said chamber, a thin, bowed charge cutting knife mounted adjacent said chamber and having its ends bearing against said blocks, and means for moving said knife downwardly into charge cutting position and for straightening said knife during said operation.

2. In a cigar machine, a bunch charge transfer, a tobacco compression chamber, a device for moving said transfer to and from bunch charge receiving and discharging positions, said chamber having a discharge opening for discharging tobacco therethrough into said transfer, and mechanism for cutting bunch charges of tobacco from tobacco fed from said chamber, said mechanism comprising a knife carried by a bow and a knife mounted in said support, means for actuating said support to move said knife and cut a charge of tobacco prior to the operation of said device, and devices in the path of movement of said knife constructed and arranged to straighten said knife during its cutting movement.

3. In a cigar machine having a tobacco compression chamber provided with a discharge opening, a ledger plate adjacent said opening, a charge transfer provided with a bunch charge receiving pocket normally positioned in alignment with said chamber, mechanism for cutting bunch charges of tobacco from the tobacco in said chamber comprising a cross head, a relatively thin bowed knife fixed to said cross head for travel therewith, guide means adjacent the opening of said chamber for guiding and flattening said knife as it moves downwardly to cut charges, and means for moving said transfer from receiving to discharging position after a charge has been cut from said tobacco in said chamber.

4. In a cigar machine, a bunch charge transfer provided with a bunch charge receiving pocket, and means for ejecting a bunch therefrom, a reciprocating cross head mounted said transfer for movement to and from charge receiving position, a charge compression chamber adapted to contain a column of tobacco, and mechanism for separating bunch charges from the tobacco in said chamber comprising a movable knife support, a thin bowed knife carried by said support, means for operating said support to move said knife past said pocket to cut charges of tobacco from said column, and means for flattening said knife to produce a positive shearing effect on said tobacco during the cutting operation.

5. In a cigar machine having a bunch charge transfer, a charge compression chamber adapted to contain a supply of tobacco for said transfer, a reciprocating cross head, a thin bowed knife, means for mounting said knife on a reciprocating cross head, a ledger plate, guiding blocks adjacent the ends of said ledger plate, and means for moving said cross head to move said knife into cooperation with and along said blocks to flatten said knife and guide the cutting edge thereof against said ledger plate to sever charges of tobacco from said support in said chamber.

6. In a cigar machine having means for form-
ing bunch charges of tobacco and transferring them to a rolling station, a bunch charge compression chamber adapted to contain tobacco from which said charges may be formed and having a discharge opening through which said tobacco may be moved, a thin bowed knife, a ledger plate adjacent one edge of said opening, tapered guide blocks located adjacent the ends of said ledger plate, and means for moving said knife downwardly along said blocks to flatten said knife and guide the cutting edge thereof into cutting relationship with said plate to separate charges of tobacco therefrom.

7. In a cigar machine having a charge compression chamber adapted to contain a supply of tobacco and a bunch charge transfer for holding and transferring bunch charges of tobacco cut therefrom to rolling mechanism, and means for moving said transfer to discharge position, mechanism for cutting bunch charges of tobacco from said tobacco in said chamber, said mechanism including a thin bowed knife, a ledger plate, guide blocks adjacent the ends of said ledger plate, and means for moving said knife along said blocks and into cooperation with said ledger plate for straightening said knife during the cutting operations to provide a shearing action.

8. Tobacco cutting mechanism comprising a support for tobacco, means for advancing tobacco along said support to a cutting position, a thin bowed knife mounted adjacent said position, means for moving said knife downwardly to cut said tobacco, and means operative by movement of said knife relative to said support at said position for straightening said knife during said cutting operation.

9. Tobacco cutting mechanism comprising a support for tobacco including a channel having spaced confining walls lying in substantially parallel vertically spaced horizontal planes, a ledger plate carried by the lower of said walls and mounted adjacent said opening, a charge transfer provided with a bunch charge receiving pocket normally positioned substantially in alignment with said chamber, means for advancing tobacco along said channel and into said pocket, means for cutting bunch charges of tobacco from the tobacco in said channel comprising a cross head, a relatively thin bowed knife fixed to said cross head for travel therewith across said discharge opening of said chamber, means for guiding and flattening said knife as it moves to charge cutting position, means for holding said knife stationary to close said chamber after a charge has been cut, and means for moving said knife from receiving to discharging position prior to the return of said knife to inoperative position.

11. In a cigar machine, a bunch charge transfer provided with a bunch receiving pocket and means for ejecting a bunch charge therefrom, a cross head mounting said transfer for movement to and from charge receiving position, a charge compression chamber adapted to contain a column of tobacco, mechanism for separating bunch charges from the tobacco in said chamber comprising, a movable knife support, a thin bowed knife carried by said support, means for operating said support to move said knife between said chamber and said pocket to cut charges of tobacco from said column, means for flattening said knife to produce a positive shearing effect on said tobacco during the cutting operation, and means operative at the conclusion of said cutting operation for operating said cross head to cause said transfer to move from charge receiving position to and from a charge delivering position.

12. In a cigar machine having a tobacco compression chamber provided with a discharge opening, said chamber including a channel having spaced confining walls lying in substantially parallel vertically spaced horizontal planes, a ledger plate carried by the lower of said walls and mounted adjacent said opening, a charge transfer provided with a bunch charge receiving pocket normally positioned substantially in alignment with said chamber, means for advancing tobacco along said channel and into said pocket, means for cutting bunch charges of tobacco from the tobacco in said channel comprising a cross head, a relatively thin bowed knife fixed to said cross head for travel therewith across said discharge opening of said chamber, means for guiding and flattening said knife as it moves to charge cutting position, means for holding said knife stationary to close said chamber after a charge has been cut, and means for moving said knife from receiving to discharging position prior to the return of said knife to inoperative position.

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