This invention relates to button blank slicing machines and has for its primary object to provide a machine adapted to receive cylindrical cores of mixed lengths and in random positions and automatically to feed, orient, slice and discharge the cores as button blanks.

The machine has been contrived primarily with mother-of-pearl in view as the material operated upon, and it will be illustratively described in connection with mother-of-pearl. It is to be understood, however, that the machine is applicable to other materials.

In the making of button blanks from mother-of-pearl, cylindrical cores of predetermined diameter but of mixed lengths are drilled from shells by means of hollow cylindrical drills. The core or slug diameters chosen are likely to be from twelve to thirty-six lines. The cores thus formed are apt to vary in length and thickness from a minimum too thin to form a button blank up to a maximum of perhaps a half-inch or so. According to conventional practice the cores are hand-fed to a slicing machine which employs cutting discs or saws about 915" thick and which slices the cores into blanks two and one-half to three and one-half lines in thickness according to the spacing of the saws. Since the cores are made of predetermined diameters all the cores of a given lot will be of the same diameter and to that extent at least will be well adapted to be dealt with automatically. The fact that the blanks are of mixed lengths, however, and that they are received initially in random positions presents serious difficulties from the standpoint of automatic slicing.

In accordance with a practical and advantageous embodiment of the invention, the automatic button slicing machine is made to include a hopper having an open funnel-like bottom from which cores of mixed lengths are discharged in random positions, a separator for regulating the discharge of the cores from the hopper, a guide for conducting the cores from the hopper, a spinner for receiving the cores and setting them into rotation with their axes disposed in a predetermined direction, the spinner comprising a series of rollers moveable sequentially in a common orbit, and means for rotating the rollers about their individual axes all in the same direction, a set of slicing cutters disposed at a cutting station, a core supporting wheel coaxial with the spinner and driven in unison with it and including clamps for carrying the cores through the cutting station, and means for transferring cores from the spinner to the core supporting wheel in advance of the cutting station.

Other advantageous features of the invention have to do with the hopper, the separator, the spinner, the core supporting wheel, the mechanism for transferring the cores or slugs from the spinner to the core supporting wheel, and the coordinated combinations and arrangements of these parts with one another.

Other objects and advantages will hereinafter appear.

In the drawing forming part of this specification.

Figure 1 is a plan view, partly broken away, of a novel automatic slicing machine embodying features of the invention;

Figure 2 is a view in front elevation, partly in section and partly broken away, of the machine illustrated in Figure 1 together with a collecting receptacle;

Figure 3 is a fragmentary view, partly in section and partly broken away, the section being taken upon the line 3—3 of Figure 2, looking in the direction of the arrows;

Figure 4 is a fragmentary view in sectional elevation, the section being taken upon the line 4—4 of Figure 1, looking in the direction of the arrows;

Figure 5 is a fragmentary sectional view, taken upon the line 5—5 of Figure 2, looking in the direction of the arrows, the core supporting wheel being partially shown in broken lines;

Figure 6 is a fragmentary sectional view, taken through the spinner and core supporting wheel, the section being taken upon the line 6—6 of Figure 7, looking in the direction of the arrows;

Figure 7 is a sectional view, taken upon the line 7—7 of Figure 6, looking in the direction of the arrows; and

Figure 8 is a fragmentary detailed view showing particularly the mounting of one of the movable clamping jaws on the core supporting wheel and the saws of the cutter associated with said jaw.

As an aid to an understanding of the detailed description the machine will be first briefly described in a comprehensive manner without attention to detail. The cores or slugs 1, all of the same diameter but of mixed lengths, are dumped into a hopper 2 (Figure 3) having an open funnel-like bottom. A disc separator 3 rotates about a horizontal axis beneath the open bottom of the hopper and is formed with a core receiving recess 4 of adjustable depth. At each revolution of the separator the floor is intended that one or more cores will be carried away in the recess 4 and discharged into a chute 5 which leads down and
deposits the cores in random positions between two adjacent wheels 6 of a spinner 7.

The wheels 6 are mounted upon a carrier 8 which is carried by a driven shaft 9. The wheels 6 travel in a common orbital path about the axis of the shaft 9 and are all caused through suitable gearing to rotate rapidly in a common direction. The wheels may be knurled or smooth.

While they do not contact one another, each stands in proximity to its neighbors so that even a very thin core cannot slip through between two adjacent wheels. A core received between two of thickness as quickly set into motion, and even though it be a very thin core it will quickly be caused automatically to assume a position in which its own axis extends parallel to the axes of the rollers 6.

As the cores are spun to orient them they are carried forward from the point at which they were received from the chute 5 to a point at which they are to be discharged from the spinner 7 to a core supporting wheel 10 which is also mounted upon and driven in unison with the shaft 9.

The transfer from the spinner to the core supporting wheel is effected by a pusher rod 11 which is reciprocally mounted in a rocker arm support 12. The rocker arm 12 is rocketed mounted on the shaft 9 and is arranged to travel in unison with the spinner 7 and the core supporting wheel 10 from the full line position indicated in Figure 3 to the broken line position indicated at 120 in Figure 3, and then to return to the full line position as the arm 12 travels forward. The pusher rod 11 is caused to execute a complete reciprocation including core transferring an operation as the rocker arm 12 travels forward, the core or cores in the course of this operation being pushed through a V-guide 13 which is formed in a portion of the rocker arm 12.

As a result of the transferring operation described the cores are delivered onto the core supporting wheel at a receiving station located in advance of a cutter 14. For each spinner couple on the spinner 7 the core supporting wheel 10 is provided with a clamp comprising a fixed jaw 15 and a movable jaw 16. The movable jaws stand normally open but each movable jaw is forced by a stationary cam 17 to move to a closed position at the receiving station and to clamp the cores firmly in place as they travel past the saw or cutter at the cutting station. After the cores have been carried through the cutting station and slid into blanks that the associated jaw is caused to open so that the blanks may be deposited by gravity into a discharge chute 18.

The hopper 2 is pivotally supported by means of a hinge 19 upon a frame member 20. The hopper is provided with ears 21 at its opposite sides which bear through springs 22 upon arms 23 of levers 24. The levers 24 are pivotally mounted upon a pivot rod 25 which is carried by the frame member 20. The levers 24 are rigidly connected to one another by a connecting rod 26 and include downturned arms 27 which, through followers 28, bear upon cam portions 29 of discs 31 which form side walls of the separator 3. The cam portions 29 include actuating teeth 30 through which actuating impulses are imparted to the hopper.

Between the discs 31 there is interposed a comparatively thick wire 32 which is cut away for its full thickness and to a uniform and substantial depth for more than half of its angular extent, so that an extensive pocket is formed between the discs 31. The pocket is covered at one end by a thin, tapering masking sector 33 which is secured between the discs 31 and which provides a nearly cylindrical outer surface to form an extension of the cylindrical surface of the disc 32.

A sector 34 of tapering thickness is formed in the pocket defined by the discs 31 and 32 with provision for angular adjustment. A clamping screw 35 is passed through an arcuate slot 36 formed in one of the discs 31, and is threaded into the sector 34. The inner wall of the sector 34 is of hollow cylindrical form, being adapted to fit against a complementary cylindrical surface 37 of the disc 32 throughout its adjustable range. The forward extremity of the wedge or sector 34 is made thin, but the outer wall of the sector is of spiral form so that the radius gradually increases from substantially that of the surface 37 at the forward end to that of the inner surface 38 of the masking sector 33 at the rear end. At the rear end the sector 34 is of maximum thickness for an extent substantially equal to the angular extent of the masking sector 33.

The separator defines a core receiving recess which travels beneath the hopper at each revolution of the separator, the recess having a forward radial wall 39 formed on the disc 32, side walls formed on the discs 31, and a floor formed either by the outer face of the sector 34 alone or by that face in combination with the surface 37 of the disc 32. The disc provides no fifth recess wall, but a movable wall is provided on the hopper itself. A stationary arm 40, affixed to the hopper, pivotally supports an arm 41 upon which a movable wall member 42 is made fast. The wall 42 extends substantially tangent to the hopper wall and bears against the periphery of the disc 32. The movable wall drops down into the recess as soon as the wall 38 has moved clear of it, to close the space between the disc 32 and the hub.

Besides cooperating with the movable wall 42 in the manner just described, the sloping surface of the sector 34 cooperates in a very important way with the cores. It will sometimes happen that a core which has partially escaped from the hopper cannot move completely clear of the hopper. In such a case, if the separator carried an unyielding, abrupt rear pocket wall, breakage of some sort would have to occur. The spiral face of the sector 34, however, simply eases the obstructed core back into the hopper far enough to clear the separator so that the core thus returned may have a fresh chance to enter the deepest part of the emptied recess the next time the recess comes into receiving position.

The sector 34 is made adjustable in order to regulate the capacity of the pocket. It is expected that at times a plurality of cores will be carried away from the hopper together. It is not desired, however, that cores whose combined length exceeds the width of the core supporting wheel shall be delivered together. By adjusting the sector forward and backward an optimum adjustment can be determined for causing the maximum practical average rate of delivery to be achieved without exceeding the maximum permissible rate. The separator is driven by a shaft 45 upon which the discs 31 and 32 are made fast.

The cores carried away from the hopper by the
separator are dumped into the chute 5 down which they tumble and slide to the spinner 1. The spinner 1 comprises the carrier wheel 8 having two flanges between which the spinner rollers 6 are revolved. The rollers are made fast upon their respective shafts 45 and the shafts being mounted in bearings 47 provided in the flanges. In the illustrative machine there are ten of the rollers, all disposed at equal intervals in a common plane. The fastener 6 is arranged to escape engagement with one another. Each shaft 45 has fast upon one of its ends a driving pinion 43, and the ten pinions 45 are driven in common by a gear 49. The gear 49 is mounted upon the shaft 9 and is driven at a much higher angular speed than the shaft 5 in order to cause the spinner rollers 8 to turn rapidly. The gear 45 bears at one side against the spinner 6 and at the other side against a conning collar 50 which is made fast upon the shaft 9. As the rollers 8 spin to set the cores into rotation and thereby to deflect the cores, they travel in their common orbit about the axis of the shaft 9. The purpose of the orbital movement is to keep each of the individual spinners formed by two of the adjacent rollers 6 in axial alignment with corresponding clamp provided on slots 59 which are formed in the central core 19. In this way the travelling core supporting wheel which carries the cores past the cutter can be caused to receive cores from the spinner without having its uniform rotary motion interrupted or modified.

The core supporting wheel comprises a hub 51 having a flange 52 and a disc 53 whose margin extends outward beyond the body of the hub. The hub 51 and the disc 53 are secured to one another, and the hub 54 of the disc 53 is keyed to the shaft 5. As illustrated, the hub is made integral with the carrier 8, but this is not essential so long as the core supporting wheel and carrier are both made fast upon the shaft 9 for rotation in unison with the shaft and with one another.

A hollow sleeve or cylinder 55 is secured between the disc 53 and the flange 52, and is provided with ten of the fixed clamping jaws 15, each formed with a V-notch 58 which is in line with the bit or angle formed by one of the adjacent pairs of spinner rollers 6. The jaws 15 extend past the slots 59 into the centrally located core 19. The cylinder 55, but protrude beyond the periphery of the cylinder. The jaws 15 are desirably secured to the cylinder by welding.

A movable jaw 16 cooperates with each fixed jaw 15. Each movable jaw is supported upon a pivot pin 56 carried by the disc 53 just inside the hollow cylinder 56 and by the flange 52 on the hollow cylinder 56. Each jaw 16 comprises an outwardly extending arm 51 which passes through one of the slots 53, a circumferentially extending clamping arm 52, and a tail portion 53. The arms 51 and 62 of the movable jaws and the walls of the fixed jaws are slotted down to the maximum depth of penetration of the cutting discs of the cutter 14 (see particularly Figures 1, 2, 6, 7 and 8). Each tail portion 63 is thrust clockwise by a compression spring 64 which protrudes from a recess 65 formed in the hub 51, to bias the movable jaw toward an open position. Each pivot pin 56 is also provided with an arm 65a which carries a cam follower roller which runs in and 70 for cooperating with the clamp controlling cam 17.

The cam is constructed and arranged to close movable clamping jaw 16 just after a core or series of cores has been received and before the pusher rod 11 recedes. Each movable jaw is held closed until the clamped work has been carried past the cutting station, after which the jaw is permitted to open for releasing the sliced button blanks. The cam 17 is provided with a non-circular mounting stem 67 which is received in a non-circular bore 68 of a hollow arm 69 that projects from a frame member 70. A spring 71 is lodged in the bore 68 under the cam toward follower engagement position.

The transfer of each core or associated group of cores is effected by the pusher rod 11 which, as has been previously pointed out, is carried by a rocker arm 12. An explanation of this mechanism requires, however, a preliminary understanding of the drive mechanism and the relative timing of the principal operating parts.

The principal drive motor 12 is connected through pulleys 73 and 74 and a belt 75 to drive the shaft 45 upon which the disc separator is made fast. It may be assumed that this shaft is driven at the rate of forty revolutions per minute so that forty core charges per minute are delivered to the spinner. For purely illustrative purposes this rate of operation will be assumed in all of the description which is to follow. The shaft 45 is connected through gears 76, 77, 78 and 79 to drive the shaft 9 at one-tenth of its own rotary speed, or at four revolutions per minute, so that a fresh pair of spinner rollers 6 will be in position to receive each core charge delivered by the separator 3. The gears 77 and 78 are fixed to one another and are rotatably mounted upon a pin 80, the pin being affixed to a stationary frame member 81. The gear 79 is provided with a ten-toothed hub 82 which is pinned to the shaft 9 and which constitutes a clutch member.

A complementary shiftable clutch member 83, also provided with ten teeth, is slidably carried upon a hollow shaft 84 which forms a unitary part of the rocker arm 12. A clutch shifting fork 85 mounted on a fixed pivot pin 86 embraces the clutch member 83 and carries shifting pin 87 which extend into a circumferential groove or circumferentially extending grooves of the clutch member. The tension spring 88 is connected at one end to a tail portion of the fork 85 and at the opposite end to a screw 89 which is adjustably threaded through an ear 90 of the frame member 81. The spring 88 urges the clutch shifting fork toward clutch engaging position.

So long as the clutch members are engaged the rocker arm 12 is carried forward in unison with the shaft 9, and hence in unison with the spinner carrier 8 and the core supporting wheel 10. Provision is made, however, of means for automatically disengaging the clutch members ten times in the course of one revolution of the shaft 9 and for returning the rocker arm to its starting position each time the clutch members are disengaged. It is while the rocker arm is travelling forward in unison with the spinner and the core supporting wheel that the plunger rod 11 is thrust forward to effect a core transfer and then retracted.

For the purpose of reciprocating the plunger rod 11 a dovetailed slide 91 is slidably mounted in a stationary dovetailed guideway 92. The slide includes a laterally extending arm 93 in which an arcuate slot 94 (Fig. 4) is formed. The slot is made concentric with the shaft 9 and is long enough to accommodate the angular movement of the plunger rod 11 with the rocker arm 12. A rear hollow section 95 of the plunger rod 11 (Fig. 2) has a reduced rear end portion 96.
passed through the slot 84. A collar 91 fixed on the reduced end portion 96 compels the section 95 to move axially in unison with the slide while leaving it free to travel along the slot.

The forward section of the plunger rod 11 comprises a long slender forward portion 98 and a larger rear portion 99. The rear portion 99 is contained within the hollow section 95 and is urged forward by a compression coil spring 106 which is also contained within the hollow section 95. The slider-forward end 96 extends through a restricted opening provided in the forward end of the hollow section 95, this opening being too small to pass the rod portion 99. When the slide is thrust forward it is moved to a definite forward limit and carries the rod section 96 to a definite forward limit. Because the core or cores being transferred will have different aggregate lengths the spring 106 is provided. When the rod portion 99 is arrested by the cores having been moved to their forward limit of movement the hollow member 95 can continue forward to its prescribed forward limit.

For operating the slide 91 in properly timed relation with the other parts the shaft 45 is connected through bevel gears 101 and 102 to drive a vertical shaft 163 (Fig. 2) in unison with itself. This shaft 163 is then connected through bevel gears 104 and 105 to drive a horizontal shaft 108 in unison with itself. It will thus be seen that the shaft 108 travels at the same angular speed as the shaft 45. A flywheel 107 has radially connected to it a connecting rod 109, the opposite end of the connecting rod being pivotally connected to the slide 91. The connection from the flywheel 107 to the connecting rod 109 is effected through a slide 110 which is slidably mounted in a radial groove 111 formed in one face of the flywheel 107. A clamping screw 112 is passed through a radial slot 113 of the flywheel and threaded into the slide 110 for securing the slide in any selected position of adjustment. The slide 110 carries a pivot pin 114 upon which the connecting rod 109 is rotatably mounted.

As the parts are illustrated in Figure 2, the clutch members 82 and 83 are disengaged and the pusher rod 11 will begin to move toward the left. Before the forward end of the pusher rod has moved between adjacent pinions 46 of the spinner, the clutch members 82 and 83 will have become engaged and the rocker arm 12 will be moving in unison with the shaft 9 with the pusher rod perfectly aligned for cooperating with the spinner and with the core supporting wheel.

As the slide is shown in Figure 2, an abutment 115 carried by the arm 93 of the slide is pressing against a roller 116 carried at the upper end of the fork 65 to hold the fork in clutch-disk engaging position. The roller 116 is carried at the forward end of a headed screw 117. The screw 117 is threaded through an ear 118 of the arm 93 and is locked in adjusted position by a lock nut 119. As the slide moves forward carrying the abutment 115 with it the fork 65 is permitted, under the influence of the spring 38, to carry the teeth of clutch member 83 into position to be overtaken and driven by the teeth of the clutch member 82. At the instant when the teeth of clutch member 82 pick up the teeth of the clutch member 83, the pusher rod is perfectly aligned with one of the pairs of spinner rollers 48 and with one of the clamps of the core supporting wheel being driven off the spinner, through the V-guide of the rocker arm 12, and into the clamp. This alignment is maintained until the pusher rod 11 has advanced to push the core or cores into a clamp and then returned forward end 96 is clear of the pinions 46. At that time the connecting rod 109 is still short of the dead center position in which it is illustrated in Figure 2.

Just after the tip of the rod member 98 clears the pinions 46, however, the abutment 115 becomes effective, through the fork 85, to shift the clutch member 83 out of engagement with the clutch member 82. A compression coil spring 120, which bears at one end in a cavity of an abutment post 121 and at the other end in a cavity 123 formed in the lower end of the rocker arm 12, snaps the rocker arm 12 back to its original position, as illustrated in Figure 4. The rocker 12 is connected through a link 123 to the piston 124 of a dashpot 125. The dashpot includes a cylindrical chamber 125a formed in a stationary plate 125b. The rear wall of the chamber 125a is provided with a circumferential aperture 125c. A flap valve 125d covers a larger aperture 125e that extends through the piston 124. In the Figure 4 position the rocker arm is limited against further counter-clockwise movement (as viewed in Figure 4) by engagement of the piston 124 with the rear end wall of the cylinder 125c. In this position the pusher rod does not align with the next clamp, the range of movement of the rocker arm 12 being a little bit less than one-tenth of a revolution of the shaft 9. The pusher rod is, however, detained in a position such that it will align with the next clamp the instant that the driving of the clutch member 83 by the clutch member 82 is resumed.

In addition to the other gearing driven by the shaft 45 which has already been mentioned, the shaft 45 has fast upon it a large gear 126 which is in mesh with the broad gear 47 by which the pinions 46 of the spinner rollers are driven. The gear train disclosed is effective to drive the spinner rollers at a considerably higher rotary speed than the shaft 45, the purpose being to drive the rollers fast enough to cause the desired orientation of the cores. The cutter 14 consists of a series of diamond cutting discs 127 between which spacer discs 128 of lesser diameter are interposed. The cutting discs and spacers are secured upon a shaft 129 between clamping discs 130 and 131, the latter disc being held in place by a clamping nut 133 which is threaded onto a reduced end portion of the shaft 129. The shaft 129 is involutedly mounted in a bearing 134 of a frame standard 70. The shaft 129 has fast upon it a double pulley 135 which is driven through twin belts 137 from a double pulley 138 fast on the shaft 139 of a drive motor 140. The speed of the cutter has no relation to the other operating parts abutment 114 in that the cutter should be capable of slicing through the cores in the time made available for the purpose. A suitable cutter speed has been found to be thirty-four hundred revolutions per minute.

Upon reference to Figure 3, it will be seen that the cores are received by the spinner approximately four-tenths of a revolution of the shaft 9 in advance of the median cutting position.
They are carried forward with the spinner through two-tenths of a revolution before they are brought into line with the pusher rod 11. The pusher rod then travels forward a little less than one-tenth of a revolution in unison with the chuck and the spinner carrier, during which the pusher rod advances to effect transfer of the cores to the core supporting wheel and then to execute a sufficient return stroke to carry it clear of the pins 48. When the rocker arm has been advanced nearly one-tenth of a revolution the chuck and spinner carrier are returned to the starting position by the cam and snap back to the position illustrated in Figure 3. When the cores have been carried forward about one-twentieth of a revolution further the cutting begins, and for about another one-tenth of a revolution the cores are carried in intersecting relation to the saws. As the cores move clear of the saws the movable clamping jaws 15 are opened. The chute 18 for catching the sliced button blanks extends downward through the table top 141 upon which the machine is mounted and to which the frame members of the machine are desirably affixed, and directs the blanks into a collecting receptacle 142 which is located beneath the table.

I have described what I believe to be the best embodiment of my invention. I do not wish, however, to be confined to the embodiment shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

What I claim is:

1. In a machine for slicing cylindrical cores into button blanks, in combination, a hopper for the cores having an open funnel-like bottom through which the cores escape in random positions, a separator disc rotatable beneath the hopper and having a core receiving recess, said recess being of maximum depth at its leading end and tapering substantially to the vanishing point at its trailing end so that any core partially discharged from the hopper but unable to move free of it will be cammed back out of the way of the disc, and a core retaining wall member movably mounted on the hopper to prevent spilling of the cores out of the disc recess, said wall member being adapted automatically to close one side of the disc recess and to be cammed out of the way by the recess floor.

2. In a machine for slicing cylindrical cores into button blanks, in combination, a hopper for the cores having an open funnel-like bottom through which the cores escape in random positions, a separator disc rotatable beneath the hopper and having a core receiving recess, said recess being of maximum depth at its leading end and tapering substantially to the vanishing point at its trailing end so that any core partially discharged from the hopper but unable to move free of it will be cammed back out of the way of the disc, and a core retaining wall member movably mounted on the hopper to prevent spilling of the cores out of the disc recess, said wall member being adapted automatically to close one side of the disc recess and to be cammed out of the way by the recess floor.

3. In a machine for slicing cylindrical cores into button blanks, in combination, a hopper for the cores having an open funnel-like bottom through which the cores escape in random positions, a separator disc rotatable beneath the hopper and having a core receiving recess, said recess being of maximum depth at its leading end and tapering substantially to the vanishing point at its trailing end so that any core partially discharged from the hopper but unable to move free of it will be cammed back out of the way of the disc, the recess floor being defined by an angularly adjustable tapered segment, and means for securing the tapered segment in different positions of angular adjustment to vary the capacity of the recess.

4. In a machine for slicing cylindrical cores of mixed lengths into button blanks, in combination, a core spinning couple adapted to receive the cores in random positions and to set them into rotation with their axes disposed in a predetermined direction, said spinner comprising a pair of closely adjacent but non-contacting rollers, means for rotating the rollers rapidly in the same direction, means for guiding the cores to and through the spinning couple, and means for discharging the cores as rearranged from the spinning couple.

5. In a machine for slicing cylindrical cores of mixed lengths into button blanks, in combination, a core spinner adapted to receive the cores in random positions and to set them into rotation with their axes disposed in a predetermined direction, said spinner comprising a rotary carrier, a series of rollers supported on the carrier for planetary movement in a common orbit with each roller disposed in proximity to its neighbors, means for rotating all the rollers rapidly about their individual axes in the same direction, a core supporting wheel coaxial with said carrier and connected for rotation in unison therewith, clamps carried by the core supporting wheel for receiving the cores by axial thrust from the spinner, and cutters disposed at a cutting station for slicing the cores as they are carried through the cutting station by the core supporting wheel.

7. In a machine for slicing cylindrical cores of mixed lengths into button blanks, a core spinner adapted to receive the cores in random positions and to set them into rotation with their axes disposed in a predetermined direction, said spinner comprising a rotary carrier, a series of rollers supported on the carrier for planetary movement in a common orbit with each roller disposed in proximity to its neighbors, means for rotating all the rollers rapidly about their individual axes in the same direction, a core supporting wheel coaxial with said carrier and connected for rotation in unison therewith, clamps carried by the core supporting wheel for receiving the cores by axial thrust from the spinner, cutters disposed at a cutting station for slicing the cores as they are carried through the cutting station by the core supporting wheel, a reciprocating core pusher, an oscillatory pusher support, operating mechanism for the support constructed and arranged to cause it to travel forward in unison with the spinner from a core receiving station to a point short of the cutting station and then to return to the receiving station, and pusher operating mechanism constructed and arranged to cause the pusher to execute a complete reciprocation including core transferring and return strokes as the support travels forward in unison with the spinner.
8. In a machine for slicing cylindrical cores of mixed lengths into button blanks, a core spinner adapted to receive the cores in random positions and to set them into rotation with their axes disposed in a predetermined direction, said spinner comprising a rotary carrier, a series of rollers supported on the carrier for planetary movement in a common orbit with each roller disposed in proximity to its neighbors, means for rotating all the rollers rapidly about their individual axes in the same direction, a core supporting wheel co-axial with said carrier and connected for rotation in unison therewith, clamps carried by the core supporting wheel for receiving the cores by axial thrust from the spinner, cutters disposed at a cutting station for slicing the cores as they are carried through the cutting station by the core supporting wheel, a reciprocable core pusher, an oscillatory pusher support, operating mechanism for the support constructed and arranged to cause it to travel forward in unison with the spinner from a core receiving station to a point short of the cutting station and then to return to the receiving station, and pusher operating mechanism constructed and arranged to cause the pusher to execute a complete reciprocation including core transferring and return strokes as the support travels forward in unison with the spinner, said carrier including a guide through which the cores are thrust from the spinner to the core supporting wheel.

9. In a machine for slicing cylindrical cores of mixed lengths into button blanks, a core spinner adapted to receive the cores in random positions and to set them into rotation with their axes disposed in a predetermined direction, said spinner comprising a rotary carrier, a series of rollers supported on the carrier for planetary movement in a common orbit with each roller disposed in proximity to its neighbors, means for rotating all the rollers rapidly about their individual axes in the same direction, a core supporting wheel co-axial with said carrier and connected for rotation in unison therewith, clamps carried by the core supporting wheel for receiving the cores by axial thrust from the spinner, cutters disposed at a cutting station for slicing the cores as they are carried through the cutting station by the core supporting wheel, a reciprocable core pusher, an oscillatory pusher support, operating mechanism for the support constructed and arranged to cause it to travel forward in unison with the spinner from a core receiving station to a point short of the cutting station and then to return to the receiving station, and pusher operating mechanism constructed and arranged to cause the pusher to execute a complete reciprocation including core transferring and return strokes as the support travels forward in unison with the spinner, said carrier including a guide through which the cores are thrust from the spinner to the core supporting wheel.

10. In a machine for slicing cylindrical cores into button blanks, in combination, a hopper having an open funnel-like bottom from which cores of mixed lengths are discharged in random positions, a separator for regulating the discharge of the cores from the hopper, a spinner for receiving the cores and setting them into rotation with their axes disposed in a predetermined direction, said spinner comprising a series of rollers movable sequentially in a common orbit, and means for rotating the rollers about their individual axes all in the same direction, a set of slicing cutters disposed at a cutting station, a core supporting wheel co-axial with the spinner and driven in unison with it and including clamps for carrying the cores through the cutting station, and means for transferring cores from the spinner to the core supporting wheel in advance of the cutting station.

11. In a machine for slicing cylindrical cores into button blanks, in combination, a hopper, means guiding the cores from the hopper in random positions, a slicing cutter, a clamping core holder for clamping the cores and for carrying them forward, during and after slicing, means for driving the clamping core holder, a spinner receiving the cores guided from the hopper and re-arranging them with their axes extending in a predetermined direction, means for feeding the re-arranged cores axially from the spinner to the clamping core holder, and means for causing the core slices to be released by the clamping core holder for slicing.

12. In a machine for slicing cylindrical cores into button blanks, in combination, a slicing cutter, a clamping core holder for clamping the cores during slicing, a spinner comprising adjacent but non-contacting rollers for rearranging cores received in random positions and supplying the cores to the slicing cutter with their axes extending in a predetermined direction, means for feeding the cores axially to the clamping core holder, means for driving the clamping core holder to cause it to carry the cores past the slicing cutter, and means for causing the core slices to be released by the clamping core holder after slicing.

MILAN R. OSTROCHOVSKY.

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