

March 18, 1969

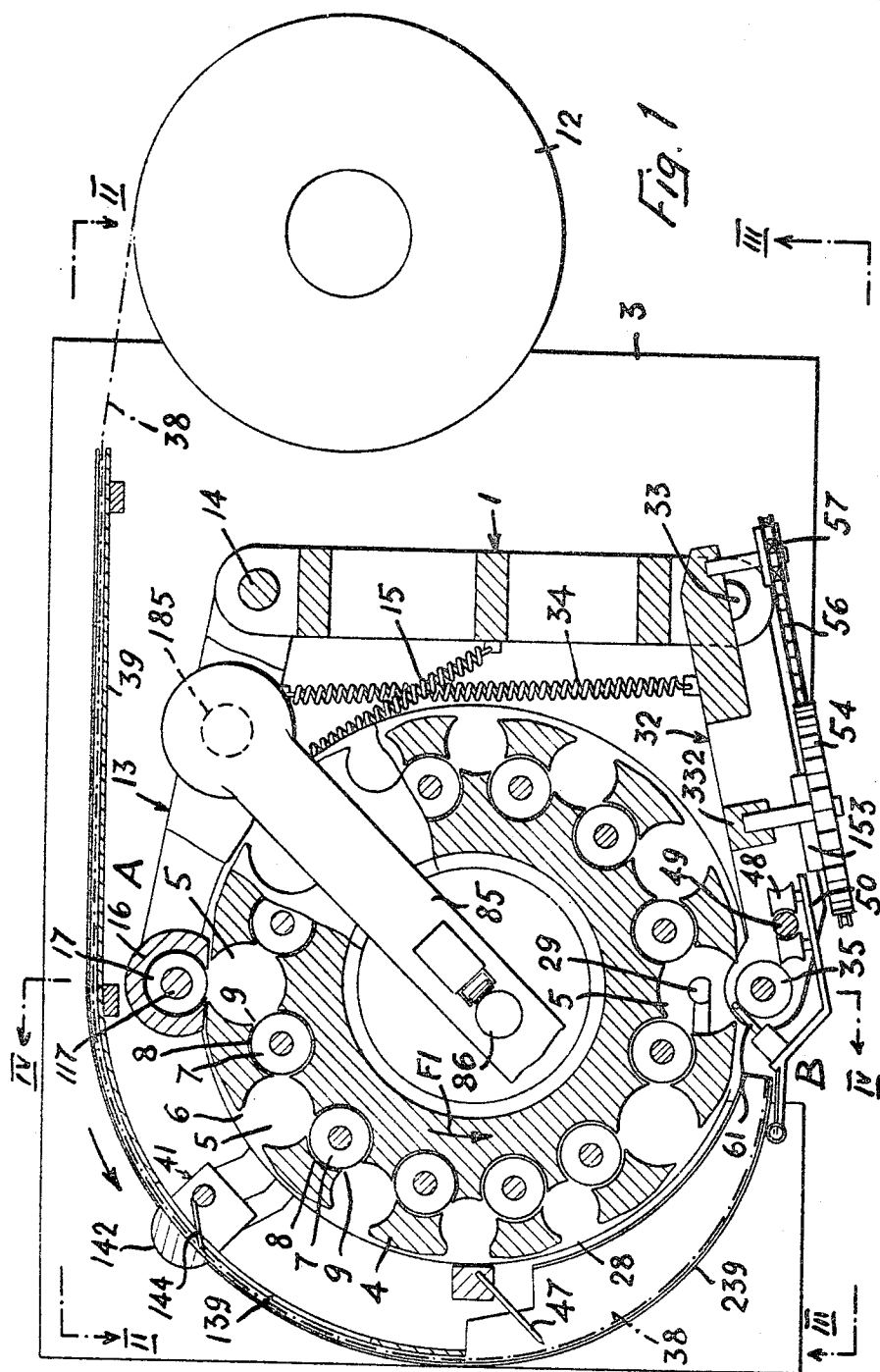
G. PICOLLO

3,432,983

AUTOMATIC COIN STACKING AND WRAPPING MACHINE

Filed Sept. 12, 1966

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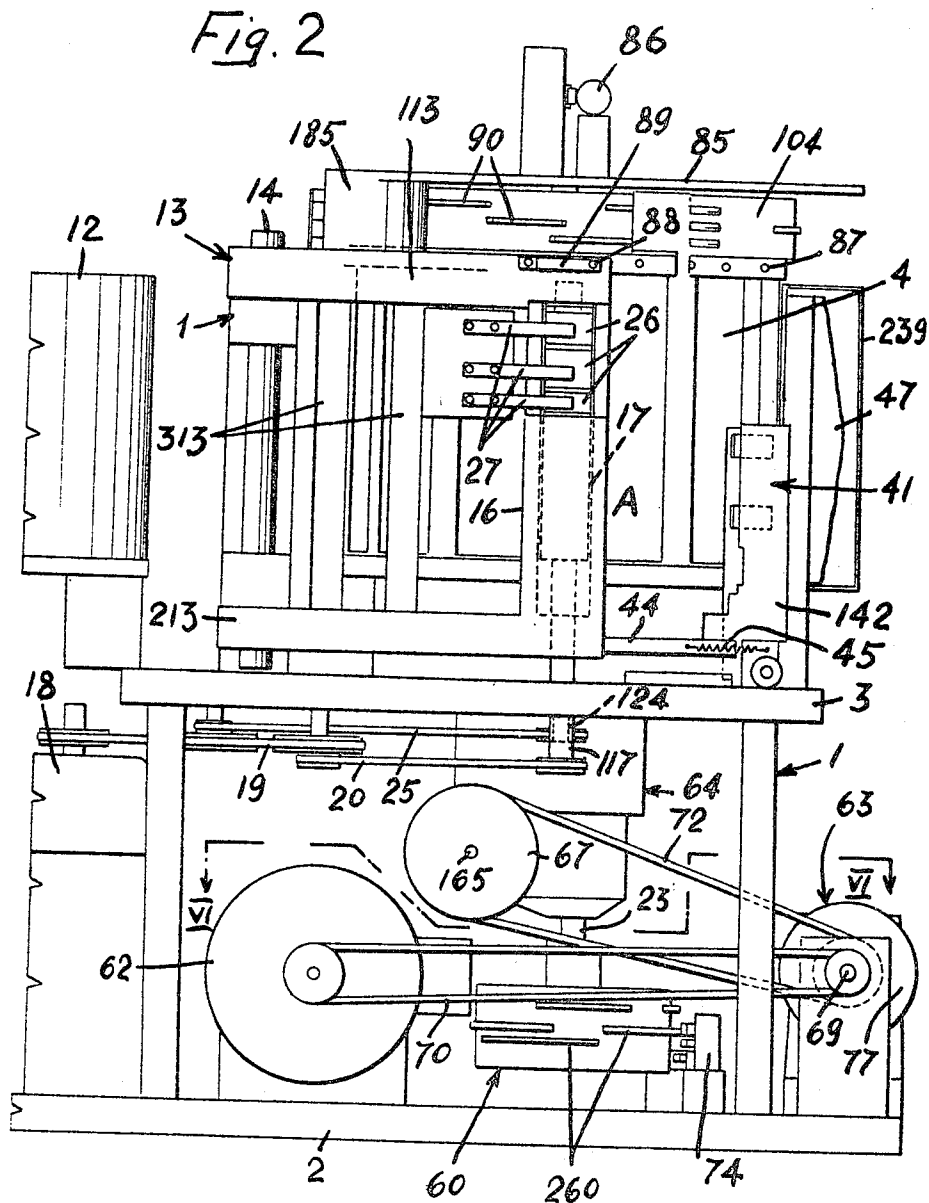
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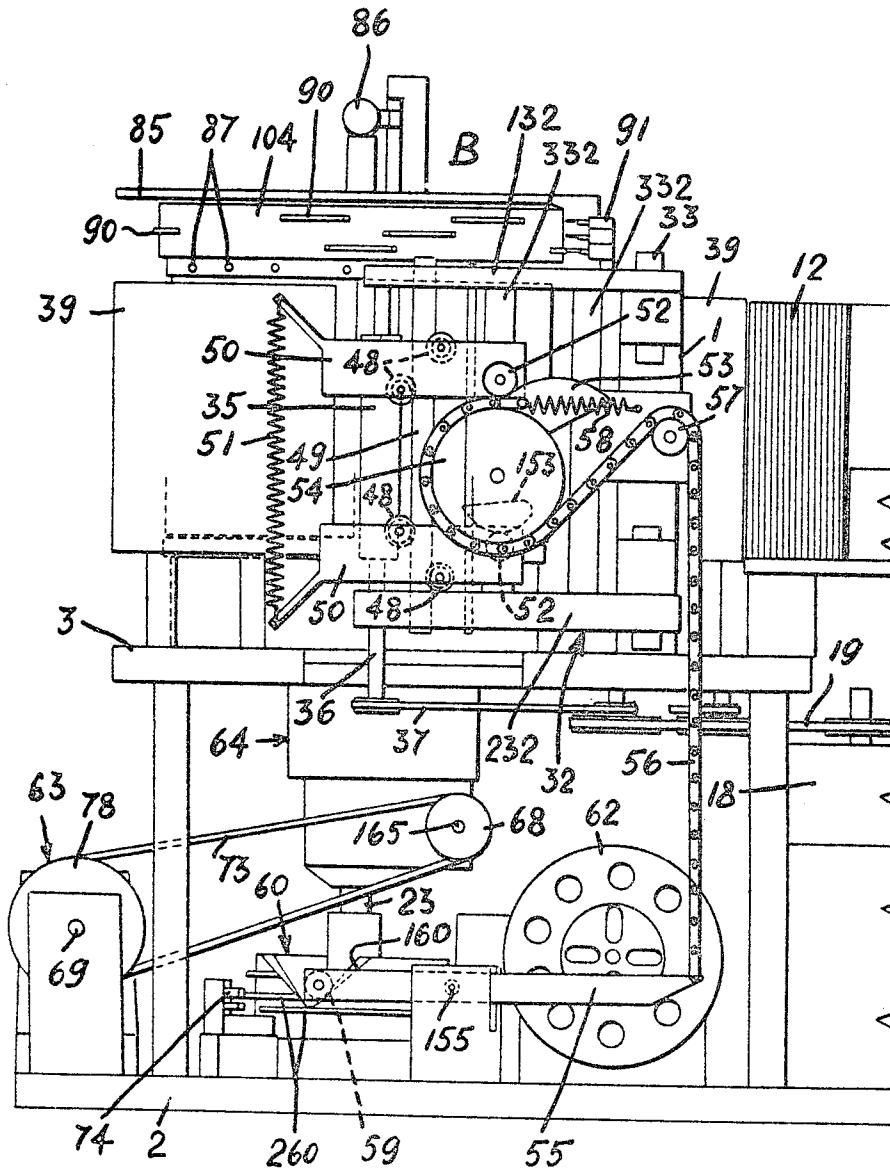
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Fig. 3



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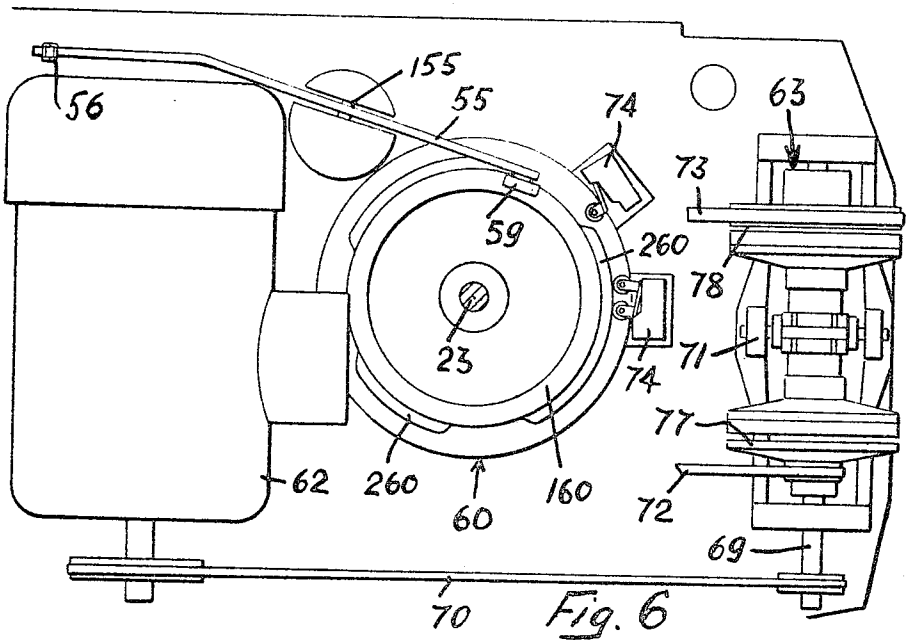
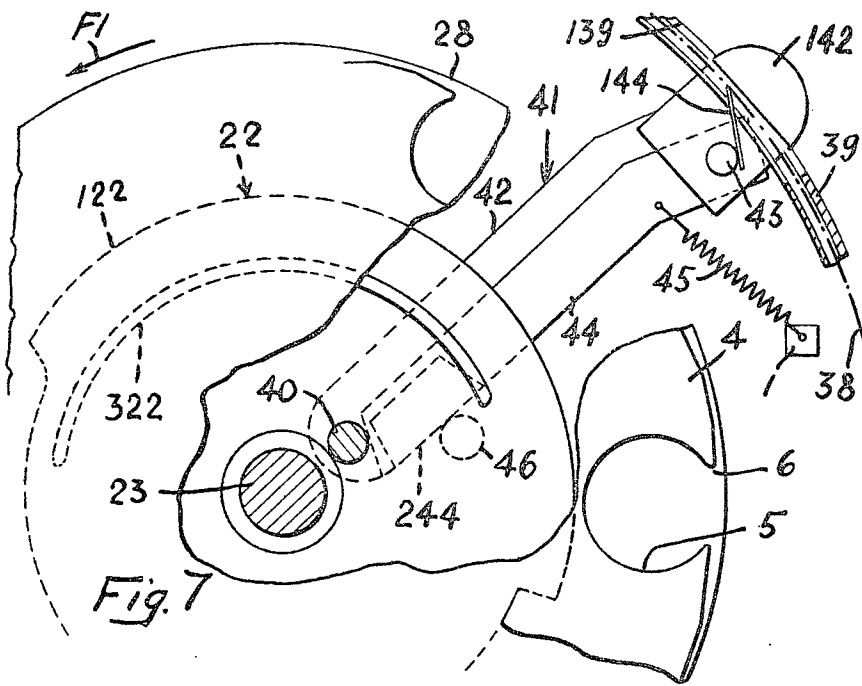
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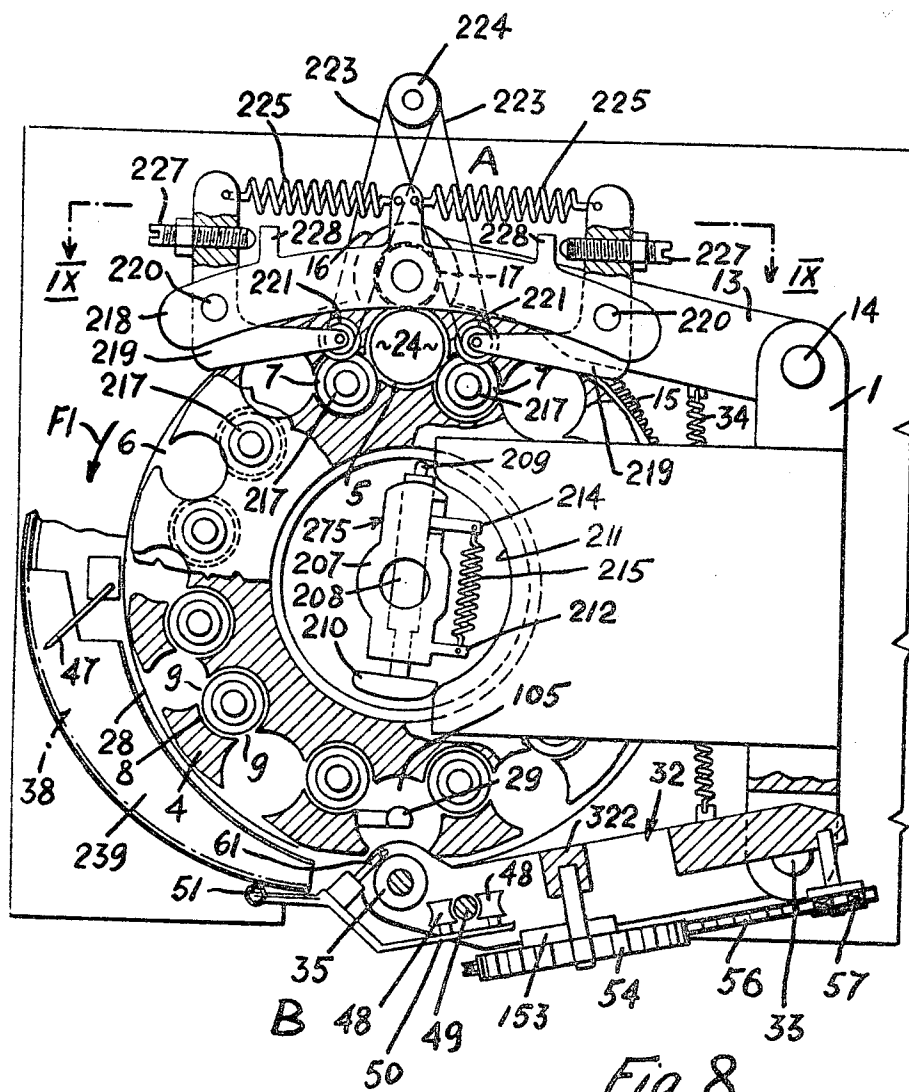
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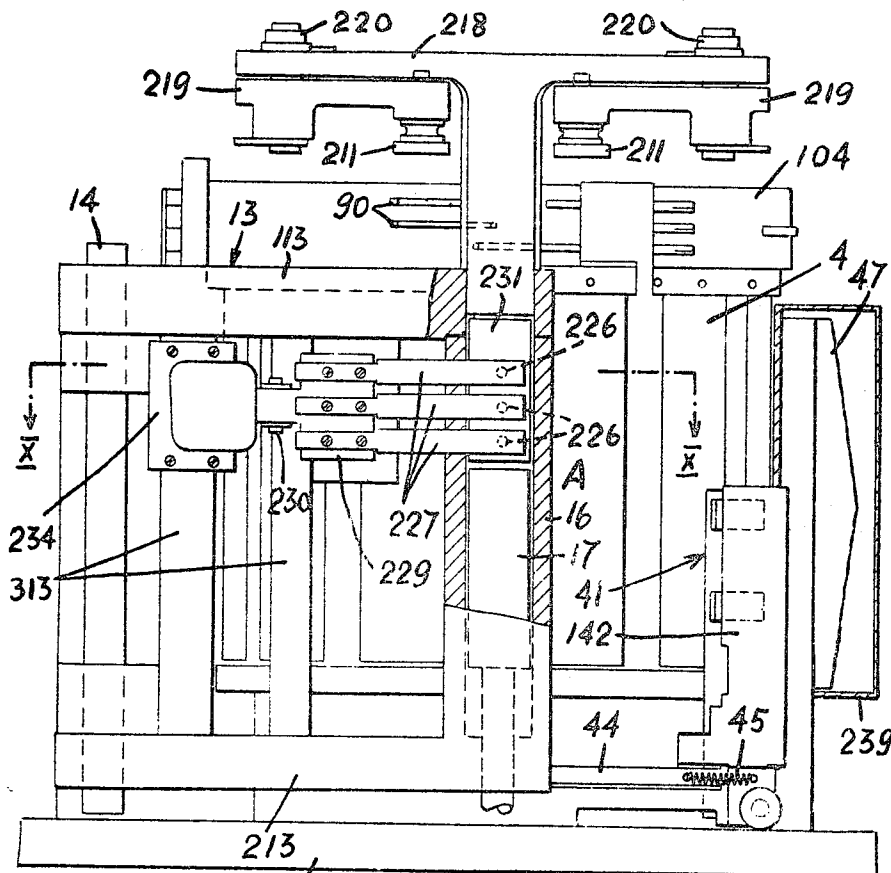


Fig. 9

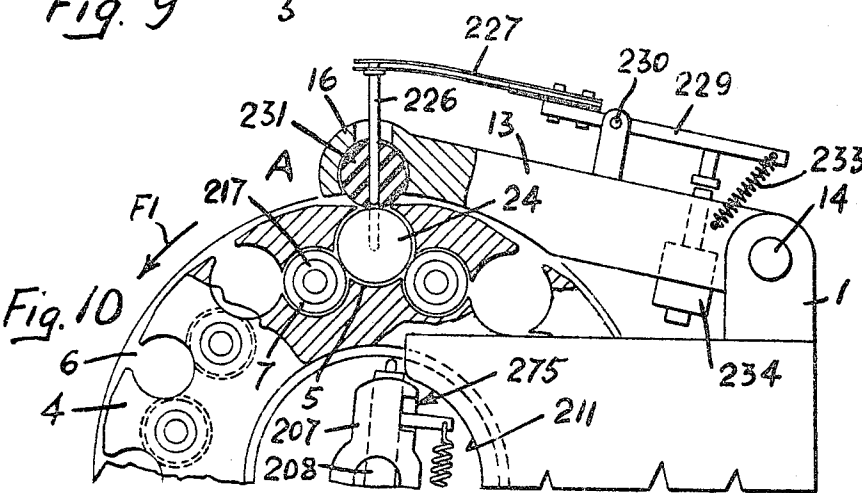


Fig. 10

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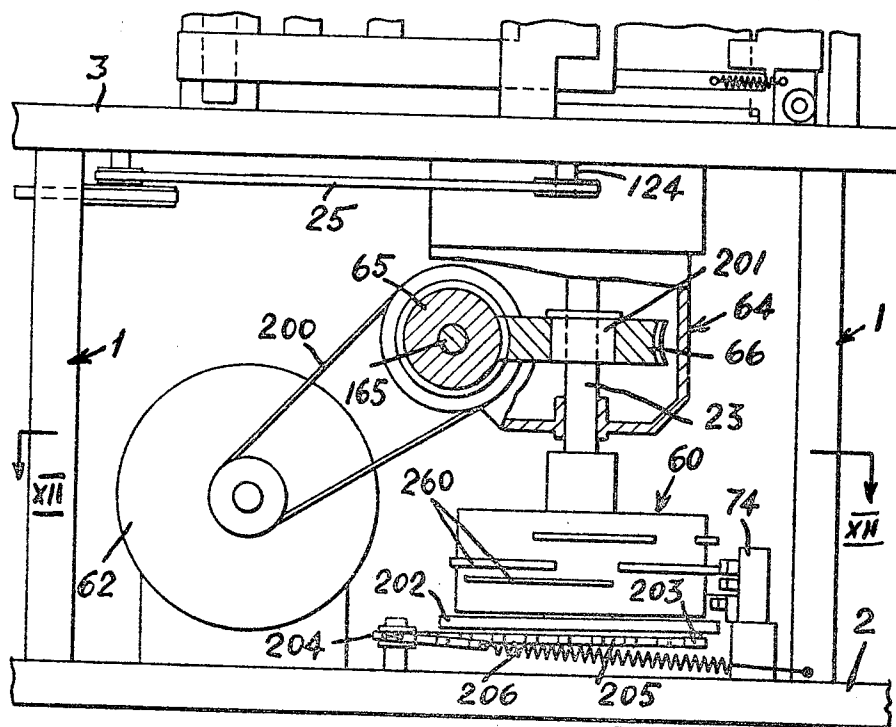


Fig. 11

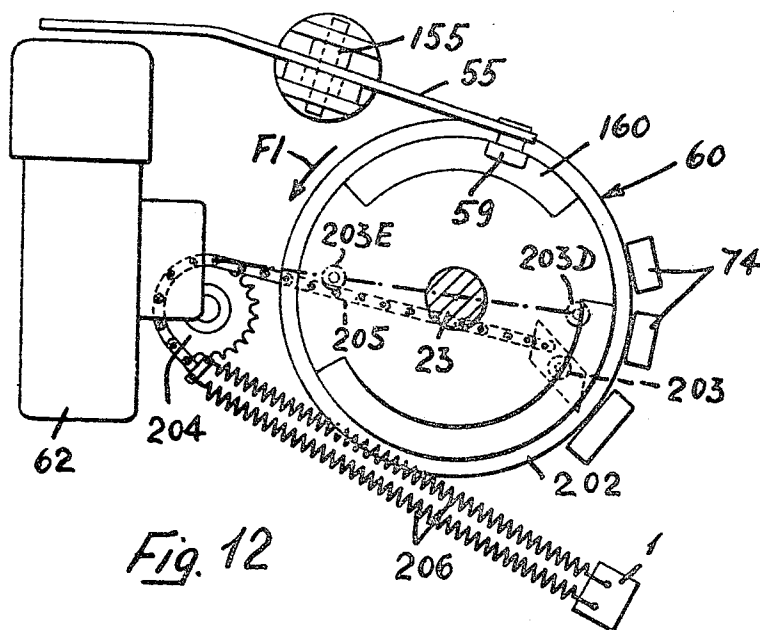


Fig. 12

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AUTOMATIC COIN STACKING AND WRAPPING MACHINE

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12 Claims

ABSTRACT OF THE DISCLOSURE

A coin stacking and wrapping machine including a conveyor drum which is mounted for rotation about a vertical axis, with an edge portion of the drum having a plurality of continuous coin storage bores which are offset relative to each other and have different diameters corresponding to different coins. A stacking station and a wrapping station which are angularly offset relative to each other are arranged around the conveyor drum, there being means for rotating the drum intermittently to transfer a coin storage bore from the stacking station to the wrapping station and then in the same direction of rotation back to the stacking station. Means are provided at the stacking station for introducing a sufficient number of coins from above into the coin storage bore to form a pile of coins of a selected height in the bore. Means are arranged at the wrapping station for wrapping in a wrapper the pile of coins contained in the coin storage bore and for removing the completed roll of coins in downward direction from the bore.

The invention relates to a coin stacking and wrapping machine, that is to say a machine which arranges a predetermined number of coins in a pile and then wraps this pile of coins in a wrapping of paper or the like so as to form a roll of coins.

The present invention provides a coin stacking and wrapping machine including a vertical conveyor drum which is rotatably mounted and has in its edge portion a plurality of continuous axially parallel coin storage bores which are offset relative to one another in the peripheral direction and have different diameters each corresponding to one type of coin, said conveyor drum being disposed between a stacking station and a wrapping station angularly offset in relation to the latter and being rotatable intermittently in such a manner that a coin storage bore at the stacking station is transferred to the wrapping station and then in the same direction of rotation is returned to the stacking station, means at the stacking station for introducing a predetermined number of coins from above into the coin storage bore to form a pile of coins of predetermined height in said bore, and means at the wrapping station for wrapping in a wrapper the pile of coins contained in the coin storage bore and for removing the completed roll of coins in the downward direction from the coin storage bore.

At the stacking station, means may be provided for rotating the pile of coins about the axis of the coin storage bore during the formation of the pile of coins, and the bottom of the coin storage bore may be closed by a rotatable supporting member for the pile of coins, said member being coaxial with the bore.

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Each coin storage bore may be accessible through an outer vertical slot in the conveyor drum, and at the stacking station a vertical rotating roller may be mounted outside the drum and be movable away from and towards the latter, said roller being urgeable, preferably resiliently, through said slot into contact with the pile of coins formed in the coin storage bore.

5 Axially parallel guide rollers may be rotatably mounted in bores in the conveyor drum and project through slots into the adjoining coin storage bores. The guide rollers may be each connected to an outer friction roller, and at the stacking station outside the conveyor drum, there may be at least one rotatable drive drum which is mounted to be movable away from and towards the drum and which can be rotated and urged, preferably resiliently, into contact with the friction roller of at least one guide roller associated with the coin storage bore at the stacking station.

10 At the stacking station, there may be a pile testing device which responds to the height of the pile of coins formed in the coin storage bore to prevent the machine from operating when a predetermined pile height is exceeded. The pile testing device may have a plurality of insulated electric contacts at different heights on the inner bounding surface of the coin storage bore, the contacts being selectively electrically energisable in accordance with the predetermined height of the pile of coins. The contacts of the pile testing device may be on the previously mentioned outer rotating roller and in conductive contact with sprung sliding contacts having a stationary mounting. The pile testing device may have a plurality of approximately horizontal resilient contacts at a distance from and above one another and which, after the formation of the pile of coins in the coin storage bore, are briefly introduced from outside into said bore through an outer slot in the conveyor drum in an approximately radial direction in relation to the latter.

At the wrapping station and beneath the conveyor drum, there may be a movably mounted supporting member which, for the purpose of supporting the pile of coins contained in the coin storage bore, is adjustable coaxially with the coin storage bore and, for the purpose of discharging the wrapped roll of coins, is arranged to be withdrawn from the region of the coin storage bore. Also, at the wrapping station, there may be a vertical rotating wrapper roller which is mounted outside the conveyor drum and is movable away from and towards the latter, and which is urgeable through an outer slot into contact with the pile of coins contained in the coin storage bore at the wrapping station.

50 A strip of wrapping material may be drawn off intermittently from a reel of wrapping material by means of a feed device so as to be introduced into the coin storage bore at the wrapping station through an outer slot provided in the conveyor drum and associated with said bore, and so as to be inserted between the pile of coins contained in the coin storage bore and a wrapping roller engaging said pile of coins, the strip being diverted from its feed path by a subsequent pull of the wrapping roller and pulled against the cutting edge of a stationary cutter to separate the strip from the reel. The feed device may include a clamp jaw gripper movable to-and-from in the feed path of the strip and which during the feed movement is closed and during the return movement is open. The clamp jaw gripper may be constructed of a pair of swing-

ably-mounted scissors type levers which are rocked forwards and closed by a driver member and are swung backwards and opened by a return spring.

At the wrapping station, a carrier may be movable away from and towards the conveyor drum, two folding fingers mounted on the carrier being movable in the vertical direction away from and towards one another, and which on the displacement of the carrier towards the conveyor drum, enter into the coin storage bore at the wrapping station, through an outer slot in the drum, and on movement towards one another are pressed resiliently against the upper and lower end surfaces of the pile of coins situated in the coin storage bore to fold over the corresponding edges of the wrapper of said pile of coins.

The stacking and wrapping stations may be disposed at diametrically opposite positions relative to the conveyor drum.

The conveyor drum may be mounted for free rotation in relation to a coaxial motor-driven main shaft, and a coupling device is operable to intermittently connect the conveyor drum to the main shaft for an angle of rotation of 180° in each case. The main shaft may perform two complete revolutions in each operation of the machine, the conveyor drum being coupled to the main shaft by the coupling device during the first half of each of these two complete revolutions, the coin storage bore situated at the stacking station, together with the pile of coins therein, being transferred to the wrapping station by the first half-revolution of the drum, and the same coin storage bore, when empty, being transferred to the stacking station by the second half-rotation of the drum. The second complete revolution of the main shaft may be effected at a higher speed than the first complete revolution of said shaft. The main shaft may be driven through a two-stage change-speed gearbox which is changed over to the higher speed after the first complete revolution of said shaft.

The coin storage bores of the conveyor drum may be disposed in pairs diametrically opposite one another and each two diametrically opposite coin storage bores have the same inside diameter corresponding to the same type of coin. The main shaft may perform a single complete revolution in each operation of the machine, and during the first half of this complete revolution the conveyor drum is coupled to said main shaft by the coupling device, the coin storage bore situated at the stacking station, together with the pile of coins formed therein, being transferred to the wrapping station by the half-revolution of the drum, and at the same time the diametrically opposite coin storage bore being transferred from the wrapping station to the stacking station. The first revolution of the main shaft, which is performed together with the conveyor drum, may be carried out at higher speed than the following, second half-revolution of said shaft. The main shaft may be driven by a uniformly rotatable driving means through a freewheel coupling which couples in the direction of rotation of the drum and permits the shaft to lead relative to the driving means, a crank on the main shaft being connected by a spring to the machine frame and shortly after the commencement of the rotation of the shaft being turned by the tensioned spring rapidly in the direction of rotation of the conveyor drum from one dead centre position to the other. The coupling device between the main shaft and the conveyor drum may include a slidable locking pin which is mounted on the shaft and co-operates with notches in the drum and which is arranged to be disconnected from the notches by a spring and to be inserted into the notches by a stationary cam track extending over approximately 180°.

Embodiments of the present invention will now be described, by way of example, with reference to the accompanying drawings, of which:

FIG. 1 is a plan view, partly in section, of a coin

stacking and wrapping machine according to one embodiment,

FIG. 2 is a side view of the machine, viewed from the stacking device side, that is to say in the direction of the arrows II—II in FIG. 1,

FIG. 3 is a side view of the machine, viewed from the wrapping device side, that is to say in the direction of the arrows III—III in FIG. 1,

FIG. 4 is a vertical sectional view through the upper portion of the machine on the line IV—IV in FIG. 1,

FIG. 5 is a horizontal sectional view on the line V—V in FIG. 4,

FIG. 6 is a plan view of the drive of the conveyor drum on the line VI—VI in FIG. 2,

FIG. 7 is a plan view of a part of the paper feed device,

FIG. 8 is a plan view, partly in section, of a coin stacking and wrapping machine according to a second embodiment,

FIG. 9 is a side view of the top portion of the machine, viewed from the stacking device side, that is to say in the direction of the arrows IX—IX in FIG. 8,

FIG. 10 is a partial horizontal sectional view on the line X—X in FIG. 9,

FIG. 11 is a side view, partly in section, of the drive of the conveyor drum in the machine shown in FIGS. 8 to 10, and

FIG. 12 is a plan view of the conveyor drum drive along the line XII—XII in FIG. 11.

Referring to the drawings, FIGS. 1 to 7 shows a coin stacking and wrapping machine including a machine frame 1 with a base plate 2 and a carrier plate 3 parallel to and disposed at a distance above the base plate 2. A conveyor drum 4 is rotatably mounted with a vertical axis on the carrier plate 3. Near its peripheral wall, the conveyor drum 4 has axially parallel, that is to say vertical, continuous coin storage bores 5 which are angularly offset in the peripheral direction and which have different internal diameters corresponding to each type of coin.

In the region of each coin storage bore 5, the peripheral wall of the conveyor drum 4 has a continuous, vertical slot 6 which makes the corresponding coin storage bore 5 accessible laterally from the outside. In the body of the conveyor drum 4, there are additional axially parallel, that is to say vertical bores 8, in each of which a guide roller 7 is mounted for free rotation. Between each two coin storage bores 5, there is one bore 8 with a corresponding guide roller 7. The inner peripheral surface of each bore 8 overlaps the inner peripheral surfaces of two adjoining coin storage bores 5, so that vertical slots 9 are formed through which the guide roller 7 in the bore 8 projects slightly into two adjoining coin storage bores 5.

On one side of the conveyor drum 4, there is a stacking station A and on the diametrically opposite side of the drum 4 there is a wrapping station B. The conveyor drum 4 is adjusted so that, at the commencement of each working operation of the machine, a coin storage bore 5 corresponding to the preselected type of coin to be wrapped is situated in the stacking station A. In this starting position, a predetermined number of individual coins of the preselected type is introduced from above into the coin storage bore 5 at the stacking station A, through a stationary inlet funnel 10 situated thereabove, with the aid of any desired type of coin delivery and counting device (not shown). The coins fall into the coin storage bore 5 to form a pile 11 of coins which is only partly illustrated in FIG. 4.

The conveyor drum 4 is thereupon turned through 180° in the direction of the arrow F1 (FIG. 1) so that the coin storage bore 5 together with the pile 11 of coins formed therein is brought from the stacking station A to the wrapping station B. In this working position of the conveyor drum 4, the pile 11 of coins in the coin storage bore 5 is wrapped at the wrapping station B in a paper wrapper drawn and cut off from a paper reel 12 or the

like. The roll of coins formed in this manner then drops through the bottom end of the coin storage bore 5 out of the conveyor drum 4 and is discharged. The conveyor drum 4 is then again turned 180° in the direction of the arrow F1, whereby the empty coin storage bore 5 is returned to the stacking station A and the same cycle of operations is repeated.

The rotation of the conveyor drum 4 through 180°, by which the coin storage bore 5 together with the pile 11 of coins therein is transferred from the stacking station A to the wrapping station B is effected at a predetermined speed. The following rotational movement of the conveyor drum 4 through 180°, whereby the empty coin storage bore 5 is returned from the wrapping station B to the stacking station A, is effected at a substantially higher speed.

At the stacking station A, the bottom open end of the coin storage bore 5 is closed by a rotating supporting disc 24 in which the pile 11 of coins is formed. This supporting disc 24 is fastened on a vertical shaft 124 which passes through an aperture in the carrier plate 3 and is driven through a belt drive 25 by an electric motor 18 located on the base plate 2.

At the stacking station A there is also a swinging lever 13 which is approximately tangential to the conveyor drum 4 and is mounted on the machine frame 1 so as to be rockable about a vertical pivot 14. The swinging lever 13 is pulled against the drum 4 by a spring 15 and is constructed approximately in the form of a frame consisting of two horizontal arms 113, 213 which are joined fast together by vertical struts 313 (FIG. 2). At its free end, the swinging lever 13 carries a vertical cylindrical casing 16 which is fastened between the lever arms 113, 213 and is open at its side directed towards the drum 4, that is to say is provided with a longitudinal slot. In this casing 16, there is a vertical rotating roller 17, which rotates in the same direction as the supporting disc 24 and which projects outwards through the longitudinal slot in the casing 16 against the conveyor drum 4. The shaft 117 of the rotating roller 17 is rotatably mounted in the casing 16, and extends through the bottom of the casing 16 and through an aperture in the carrier plate 3 (FIG. 5), the shaft 117 being driven by the electric motor 18 through belt drives 19, 20 (FIG. 2).

The swinging lever 13 has an extension 413 (FIG. 5) which, through a feeler roller 21, cooperates with a cam disc 22 fastened to the main shaft 23 of the machine, the cam disc 22 having a cam track 122. The arrangement is such that, when the cam track 122 engages the feeler roller 21, the swinging lever 13 is rocked outwards against the force of the spring 15. The rotating roller 17 mounted at the free end of the lever 13 is thereby lifted off the conveyor drum 4. When on the other hand the cam track 122 leaves the feeler roller 21, the swinging lever 13 is swung inwards by the spring 15 against the drum 4 so that the rotating roller 17 partly penetrates into the coin storage bore 5 situated at the stacking station A through the outer longitudinal slot 6 in the bore, and presses against the pile 11 of coins formed or being formed therein (FIG. 4).

The coins which have dropped through the inlet funnel 10 into the coin storage bore 5 to form the pile 11 of coins are rotated continuously about the vertical axis of the coin storage bore 5 on the one hand by the rotating supporting disc 24 and on the other hand by the roller 17 rotating in the same direction. This prevents the coins dropping into the coin storage bore 5 from assuming an edgewise position, that is to say the coins lying one above the other in the pile 11 of coins are thereby reliably brought into a flat position.

In the stacking station A, there is a stack testing device which responds to the height of the pile 11 of coins in the coin storage bore 5 and permits the initiation of each operation of the machine only if the height of the stack does not exceed a predetermined value. As shown

in FIGS. 2 and 4, the stack testing device includes a plurality of vertically-spaced contact rings 26 which are insulated both from one another and from the electrically conductive machine frame 1 and which are fastened to the top portion of the rotating driving roller 17. Each contact ring 26 is in contact with a sliding contact spring 27 mounted on the swinging lever 13. Depending on the preselected coin storage bore 5 or on the predetermined height of the pile 11 of coins, one of these contact rings 26 is electrically energised through the respective sliding contact spring 27. When the pile 11 of coins formed in the coin storage bore 5 has the prescribed height, the pile 11 does not come into contact with the electrically energised ring 26 and the operation of the machine can be initiated. If on the other hand the pile 11 of coins exceeds the prescribed height, because of one or more coins being in an edgewise position or because of an excess number of coins, the pile 11 comes into contact with the electrically energised contact ring 26 and closes a locking circuit between the contact ring 26 and the machine frame 1, thus preventing the initiation of the following operation of the machine.

During the first rotation through 180° of the conveyor drum 4, by which the coin storage bore 5 together with the pile 11 of coins therein is transferred from the stacking station A to the wrapping station B, the pile 11 of coins is supported on a stationary slide plate 28 located beneath the conveyor drum 4, the slide plate 28 extending from the rotating supporting disc 24 to the wrapping station B and closing the bottom ends of the coin storage bores 5.

At the wrapping station B, the pile 11 of coins is supported by an approximately vertical bottom finger 29, which is fastened to a horizontal shaft 30 rotatably mounted in the machine frame 1 and extending approximately radially to the drum axis (FIGS. 1, 4 and 5). At its inner end, the shaft 30 has a lever arm 130 with an eccentric feeler pin 31. The feeler pin 31 is engageable by a cam track 322 on the cam disc 22. The arrangement is such that on the first rotation through 180° of the conveyor drum 4, shortly before the coin storage bore 5 together with the pile 11 of coins reaches the wrapping station B, the cam track 322 engages and raises the feeler pin 31 on the lever arm 130. The lever arm 130 is thereby rocked and consequently the shaft 30 is turned in such a manner that the supporting finger 29 fastened thereon is rocked into an upwardly directed supporting position as shown. After the pile 11 of coins has been wrapped, and shortly before the further rotation through 180° of the conveyor drum 4, the cam track 322 leaves the feeler pin 31 on the lever arm 130 and the supporting finger 29 consequently swings downwardly, because of its own weight, and correspondingly turning the shaft 30, into a position of rest in which it frees the bottom aperture of the coin storage bore 5 at the wrapping station B. The wrapped roll 11 of coins consequently slides downwardly out of the coin storage bore 5.

At the wrapping station B, there is a swinging lever 32 tangential to the conveyor drum 4 which is mounted on the machine frame 1 for rocking movement about the vertical pivot 33 and is pulled against the drum 4 by a spring 34 (FIGS. 1, 3, 4 and 5). The swinging lever 32 is also constructed approximately in the form of a frame and consists of two horizontal arms 132, 232 which are connected together by vertical struts 332 (FIG. 3). At its free end, the swinging lever 32 carries a vertical rotating wrapping roller 35 mounted between the lever arms 132, 232. The shaft 36 of the wrapping roller 35 extends downwardly through an aperture in the carrier plate 3 (FIG. 4) and is driven by the electric motor 18 through belt drives 19, 37 (FIG. 3). The swing arm 32 has an extension 432 with a feeler roller 37 engageable by a cam track 222 on the cam disc 22 (FIGS. 4 and 5). The arrangement is such that, when the cam track 222 engages the feeler roller 37, the swinging lever 32 is rocked out-

wardly against the force of the spring 34. The wrapping roller 35 is thereby lifted off the conveyor drum 4. When the cam track 222 leaves the feeler roller 37, the swinging lever 32 is rocked inwardly to engage the drum 4 by the spring 34. The rotating wrapping roller 35 partly penetrates into the coin storage bore 5 situated at the wrapping station B through the outer longitudinal slot 6 in the bore and is pressed against the pile 11 of coins contained therein. The pile 11 of coins is consequently turned about its vertical axis in the coin storage bore 5 by the rotating wrapping roller 35.

The paper strip 38, illustrated in FIGS. 1 and 7 and intended for wrapping the pile of coins, is drawn off the paper reel 12 disposed at the side of the stacking station A, and with the aid of a guide plate 39 is guided around the conveyor drum 4 in the direction of rotation F1 of the latter and taken to the wrapping station B. The intermittent feeding of the paper strip 38 is effected with the aid of a gripper 41 swinging to-and-fro about a vertical pivot 40 in the region of an aperture 139 in the guide plate 39 (FIGS. 1, 2 and 7). The gripper 41 includes a swinging lever 42 which is mounted for rocking movement about the pivot 40 and carries at its free end a clamp jaw 142 lying on the outer side of the paper strip 38 (FIG. 7). At the outer end of the swinging lever 42, a two-armed clamp lever 44 is mounted for rocking movement about a pivot 43 and is connected by a tension spring 45 to the machine frame 1. The outer, shorter lever arm of the clamp lever 44 carries some resilient clamp jaws 144 which lie on the inner side of the paper strip 38 and co-operate with the clamp jaw 142 of the swinging lever 42. The inner, longer lever arm of the clamp lever 44 carries a stop member 244 which co-operates with a driver bolt 46 fastened to the cam disc 22.

The arrangement is such that in the position of rest of the paper feed device, the gripper 41, that is to say the two levers 42, 44 articulated to one another in the form of scissors, are rocked back by the spring 45 in the opposite direction to the direction of rotation F1 of the conveyor belt 4 to a stationary stop, not shown. Since the spring 45 acts on the inner lever arm of the clamp lever 44, the clamp lever 44 is rocked in relation to the swinging lever 42 in such a manner that the gripper 41 is opened, that is to say the clamp jaws 142, 144 are moved apart. Shortly after the first rotation through 180° of the conveyor drum 4, by which the coin storage bore 5 together with the pile 11 of coins formed therein is transferred from the stacking station A to the wrapping station B, the driver bolt 46 on the cam disc 22, which continues to rotate in the direction of the arrow F1, strikes against the stop 244 fastened on the inner lever arm of the clamp lever 44. The clamp lever 44 is thereby first rocked in relation to the swinging lever 42 in such a manner that the gripper 41 is closed, that is to say that the inner clamp jaws 144 are pressed against the outer clamp jaw 142 and grip the paper strip 38 lying therebetween. The gripper 41, that is to say the pair of gripper levers 42, 44, are thereupon driven in the closed condition by the driver bolt 46 of the cam disc 22 and are rocked about the pivot 40 in the direction of rotation F1 of the conveyor drum 4. The paper strip 38 gripped by the clamp jaws 142, 144 is consequently advanced in the direction of the arrow F1 and its free end is inserted in the wrapping station B through the outer longitudinal slot 6 in the coin storage bore 5 and between the pile 11 of coins lying in bore 5 and supported by the supporting finger 29, on the one hand, and the rotating wrapping roller 35 pressed against the pile 11 of coins, on the other hand. The free end of the paper strip 38 is thus gripped between the pile 11 of coins and the wrapping roller 35 and is drawn into the coin storage bore 5, thereby being wrapped around the pile 11 of coins.

The peripheral speed of the wrapping roller 35 is considerably higher than the speed of advance of the paper strip 38, the speed of advance resulting from the rocking

movement of the gripper 41. Consequently the paper strip 38 is powerfully drawn forwards in the feed device F1 immediately after being gripped by the wrapping roller 35, thereby being pressed in a widened end portion 239 of the paper guide 39 against the tip of a V-shaped knife edge of a stationary vertical cutter 47 disposed downstream of the gripper 41 in the feed device, and is thereby cut or torn off (FIGS. 1 and 2). Shortly afterwards, the driver bolt 46 of the cam disc 22 slips off the stop 244 of the clamp lever 44 owing to the eccentricity between the shaft 23 of the cam disc 22 and the pivot 40 of the gripper 41. Consequently, the clamp lever 44 is first rocked by the spring 45 about its pivot 43, in relation to the swinging lever 42, into the open position of the clamp jaws 142, 144, that is to say into the open position of the gripper 41, and thereupon the entire gripper 41, that is to say the pair of gripper levers 42, 44, is rocked back by the same spring 45, in a direction opposite to the direction of advance F1 of the paper strip 38, to its starting position. The paper strip 38 remains in the guide 39, because the gripper 41 is open during the rocking movement in the return direction.

The paper wrapper cut off from the paper strip 38 by the cutter 47 is wrapped completely around the pile 11 of coins in the coin storage bore 5 by the action of the wrapping roller 35. The two ends of the paper wrapper rolled up in this manner are thereupon folded over the corresponding ends of the pile 11 of coins, and thereby closed. For this purpose, a folding device includes two slides 50 adapted to slide up and down on a vertical guide rod 49 with the aid of running rollers 48 are located at the wrapping station B on the swinging lever 32, the slides 50 being pulled towards one another by a spring 51 stretched between them (FIGS. 1 and 3). In addition, the slides 50 have respective feeler rollers 52 engageable by associated cam members 53 and 153 respectively, which are laterally mounted on a sprocket wheel 54 rotatable on the swinging lever 32. A lever 55 is mounted on a pivot 155 on the base plate 2 of the machine frame. Secured to one arm of the lever 55, is one end of a chain 56 which is guided over a guide sprocket wheel 57 rotatably mounted on the rocking lever 32, and then around the sprocket wheel 54 provided with the cam members 53, 153. The other end of the chain 56 is fastened through a tension spring 58 to the swinging lever 32. The other arm of the lever 55 has a feeler roller 59 engageable by a cam track 160 of a cam disc 60 secured to the main shaft 23 of the machine. Each of the slides 50 carries a folding finger 61 which extends adjacent the outer longitudinal slot 6 of the coin storage bore 5 situated at the wrapping station B.

In the starting position of the above-described folding device, the feeler roller 59 of the lever 55 is engaged by a raised portion of the cam track 160, and the sprocket wheel 54 is held by means of the lever 55 and the chain 56 in an angular position in which the cam members 53, 153 hold the slides 50 apart against the force of the spring 51, that is to say hold the upper slide in an upper position and the lower slide in a lower position. The folding fingers 61 take up position above and below the corresponding end surfaces of the pile of coins lying in the coin storage bore 5, first lying outside the coin storage bore 5 as long as the swinging lever 32 is still in its outwardly rocked starting position. After the swinging lever 32 has swung inwards into its operative position, in which the wrapping roller 35 bears against the pile 11 of coins, the free ends of the folding fingers 61 also extend into the coin storage bore 5 through the outer longitudinal slot 6 in said bore. Shortly after the pile 11 of coins has been wrapped in the paper wrapper torn off from the paper strip 38, the feeler roller 59 of the lever 55 drops into a notch in the cam track 160, as shown particularly in FIG. 3. The sprocket wheel 54 is consequently turned by the spring 58 and the chain 56 in a clockwise direction in FIG. 3, in such

a manner that the feeler rollers 52 of the slides 50 are no longer supported by the cam members 53, 153. The slides 50 are consequently moved towards one another by the spring 51, and the folding fingers 61 are therefore urged against the corresponding end surfaces of the pile 11 of coins rotated by the rotating wrapping roller 35, so as to fold over the paper wrapper surrounding the pile 11 of coins. The feeler roller 59 of the lever 55 thereupon moves out of the notch in the cam track 160, whereby the lever 55 is rocked into its starting position and the slides 50 are moved apart by the cam members 53, 153 against the force of the spring 51. The folding fingers 61 are thereby lifted off the ends, which are now closed, of the completely-wrapper pile 11 of coins, and are drawn out of the coin storage bore 5 by the subsequent outwardly directed rocking movement of the swinging lever 32.

The vertical main shaft 23 of the machine is coaxial with the conveyor drum 4 and is driven by an electric motor 62, mounted on the base plate 2, through a two-stage change-speed gearbox 63 and reduction gearing 64 (FIGS. 2, 3 and 4). The reduction gearing 64 includes a worm 65 which meshes with a worm wheel 66 fastened on the shaft 23, as shown in FIG. 11 which actually relates to the second embodiment. Two belt pulleys 67, 68 which have different diameters are fastened to the worm shaft 165. The two-stage change-speed gearbox 63 includes a main shaft 69 which is driven by the electric motor 62 through a belt drive 70. Two belt pulleys 77, 78 are mounted for free rotation on the main shaft 69 and are adapted to be alternately coupled to the shaft 79 by an electromagnetic control device 71, known per se, and by drive belts 72, 73 are connected to respective belt pulleys 67 and 68 on the worm shaft 165. If the belt pulley 77 of the change-speed gearbox 63 is coupled to the main shaft 69 and consequently to the motor 62, the worm 65 is driven by the larger belt pulley 67, that is to say at a lower speed. If on the other hand the other belt pulley 78 of the change-speed gearbox 63 is coupled to the main shaft 69, the worm 65 is driven through the smaller pulley 68, that is to say at a higher speed. Both pulleys 72, 73 of the change-speed gearbox 63 can in addition be simultaneously uncoupled from the main shaft 69 for freewheeling.

The main shaft 23 projects from the casing of the reduction gearing 64 both in the downward and in the upward direction. On the bottom portion of the shaft 23, the cam disc 60 is fastened, which in addition to the cam track 160 for controlling the folding device is also provided with various cams 260 for controlling stationary electric contacts 74.

The upper portion of the shaft 23 extends into the hollow central portion of the conveyor drum 4 and, beneath the drum 4, carries the cam disc 22 which controls the movement of the swinging lever 13 at the stacking station A and the swinging lever 32 at the wrapping station B, and also the movement of the gripper 41 for the paper feed. The conveyor drum 4 is mounted for free rotation on the main shaft 23, a coupling device 75 being provided which automatically couples the drum 4 to the shaft 23 only when the drum 4 has to be rotated for the purpose of transferring the selected coin storage bore 5 from the stacking station A to the wrapping station B, and then from the wrapping station B back to the stacking station A, these rotations being through 180° in each case.

As shown in FIGS. 1, 2 and 4, the coupling device 75 includes a cup-shaped closure part 76, which closes the central hollow space of the conveyor drum 4 from above and is secured to the drum 4. The shaft 23 passes through the bottom of the closure part 76 in a freely rotatable manner and carries a radially directed locking pin 79, which co-operates with inner lateral notches 80 on the closure part 76 or drum 4 and is pressed radially inwardly by a spring 81. The top hollow end portion of

the shaft 23 contains a ball 82 which is slidable in the axial direction and which acts from above on the conical head 179 of the locking pin 79. The upper hollow end of the shaft 23 is closed by a presser 83 which is slidable in a horizontal direction relative to the shaft 23 and which is fastened by a catch 84 on the lower side of a control lever 85 provided with a handle 86. The control lever 85 extends approximately radially over the drum 4 and is articulated at 185 on the swinging lever 13. The bottom surface of the presser 83 co-operates with the ball 82 and has a central groove 183 with bevelled bounding edges (FIG. 4). The outer peripheral surface of the conveyor drum 4 has notches 87 which co-operate with a catch pin 88 which is resiliently movable in the radial direction and is mounted on the swinging lever 13. The catch pin 88 has a rounded free end and is carried by a leaf spring 89 fastened to the swinging lever 13. The upper portion of the conveyor drum 4 is constructed on the outside as a cam disc 104 and has various cams 90 which act on stationary electrical contacts 91.

In the starting position of the conveyor drum 4, in which the desired coin storage bore 5 lies at the stacking station A and the swinging lever 13 is pressing against the drum 4, the catch pin 88 engages in an outer notch 87 associated with the selected coin storage bore 5 and thus holds the drum 4 fast. This starting position of the swinging lever 13 corresponds to a rest position of the control lever 85 in which the bottom groove 183 of the presser 83 lies in the region of the ball 82, so that the latter can move upwardly. The locking pin 79 is consequently moved radially inwardly by the spring 81 into a disconnected position in which it cannot engage in the corresponding notches 80. The conveyor drum 4 is thereby uncoupled from the main shaft 23 and can be turned by hand in order to adjust the desired coin storage bore 5 to the stacking station A. During this rotation of the conveyor drum 4, the catch pin 88 springs automatically and resiliently out of the corresponding outer notches 87 and then holds the drum 4 fast in the newly adjusted starting position.

Since the outer longitudinal slots 6 of the coin storage bores 5 must have the same width, while the diameters of the bores 5 are different in accordance with the individual types of coins, the axes of the coin storage bores 5 do not lie on the same pitch circle, but are at different distances from the peripheral surface of the conveyor drum 4. Consequently, the position of the rotating supporting disc 24 at the stacking station A on the one hand and of the rockable supporting finger 29 at the wrapping station B on the other hand must also be varied according to the coin storage bore 5 selected and be adjusted coaxially to the bore 5. For this purpose, the shaft 124 of the supporting disc 24 is mounted on a lever 92 which is mounted on the machine frame for rocking movement about the pivot 292 (FIGS. 4 and 5). The lever 92 has a feeler finger 192 which, under the action of a spring (not shown), co-operates with a cam disc 93 fastened to the conveyor drum 4. The shaft 30 of the supporting finger 29 is mounted for longitudinal sliding movement in the machine frame 1 and its feeler pin 31, which is similar to a crank arm, co-operates not only in the vertical direction with the cam track 322 of the cam disc 22, but under the action of a compression spring 94 also co-operates in the horizontal direction with the cam disc 93 of the conveyor drum 4. During the adjustment of the desired coin storage bore 5 to the stacking station A, the cam disc 93 together with the drum 4 is rotated, rocking the lever 92 in such a manner that the shaft 124 of the rotating supporting disc 24 is positioned coaxially with the coin storage bore 5 at the stacking station A. At the same time, the shaft 30 of the supporting finger 29 is also displaced by the cam disc 93 in the horizontal direction, that is to say in the radial direction in relation to the drum 4, in such a manner that the supporting finger 29, after being lifted into the supporting position, is positioned coaxially

with the selected coin storage bore 5 which has been transferred from the stacking station A to the wrapping station B. During the rotary movement of the drum 4, the positions of the supporting disc 24 and the supporting finger 29 are changed because of the rotation of the cam disc 93, but in the position of the drum 4, in which the selected coin storage bore 5 is situated at the stacking or wrapping position, the supporting disc 24 and the supporting finger 29 are always positioned coaxially with the bore 5.

In the starting position of the conveyor drum 4 uncoupled from the main shaft 23, the inner notch 80 which is associated with the coin storage bore 5 at the stacking station A, lies in a position which is offset slightly forwardly in the direction of rotation F1 of the drum relative to the inwardly-moved locking pin 79. After the prescribed number of coins has been reached, the coin delivery and counting device, which drops the coins through the inlet hopper 10 into the coin storage bore 5, produces an electric starting impulse. Through the contacts 74, 91 and with the aid of the electromagnetic control device 71, the belt pulley 77, which corresponds to the slower speed of rotation of the worm shaft 165 of the change-speed gearbox 63, is coupled to the shaft 69 and consequently to the electric motor 62 which is already rotating. The main shaft 23 of the machine therefore begins to turn at a slow speed in the direction of the arrow F1. Consequently, the swinging lever 13 is rocked outwardly by the cam track 122 of the cam disc 22. The catch pin 88 is therefore drawn out of the corresponding outer notch 87 and frees the conveyor drum 4. At the same time, the control lever 85 articulated to the swinging lever 13 is moved into an engagement position in which a bevelled edge of the bottom groove 183 in the presser 83 runs on to the ball 82 and presses the latter downwards. The ball 82 in turn presses the locking pin 79 outwardly in the radial direction against the force of the spring 81, so that after a limited initial partial rotation of the shaft 23 the pin 79 moves into the advanced inner notch 80. The shaft 23 is thereby coupled to the drum 4 and drives it in its rotational movement.

After a joint rotation of the shaft 23 and of the drum 4 through 180°, that is to say when the coin storage bore 5 together with the pile 11 of coins therein has been transferred from the stacking station A to the wrapping station B, the cam track 122 of the cam disc 22 frees the swinging lever 13 and the latter is pulled inwardly by the spring 15 to engage the drum 4. The control lever 85 is thereby brought back into its starting position, in which the groove 183 of the presser 83 permits the upward displacement of the ball 82. Consequently the locking pin 79 is freed and moved radially inwardly by the spring 81, that is to say disconnected from the corresponding inner notch 80 in the conveyor drum 4. The drum 4 is thereby uncoupled from the shaft 23 and held fast in its new position by the simultaneous engagement of the catch pin 88 in an external notch 87. The shaft 23 continues to rotate, the cam track 222 of the cam disc 22 and the cam track 160 of the cam disc 60 effecting the wrapping of the pile 11 of coins and the folding-over of the edges of the paper wrapper, that is to say first swinging the swinging lever 32 inwardly to engage the drum 4, then moving the folding fingers 61 towards one another and then apart again, and thereupon swinging the swinging lever 32 outwardly away from the drum 4. At the same time, the driver bolt 46 on the cam disc 22 operates the gripper 41 for the advance of the paper strip 38. Shortly before the coin storage bore 5 arrives at the wrapping station B, the supporting finger 29 is rocked upwardly by the cam track 322 of the cam disc 22. After the pile of coins has been wrapped, this supporting finger 29 is swung downwardly again and allows the completed roll of coins to drop out of the conveyor drum 4.

In the meantime the shaft 23 has performed a first

completed revolution. The swinging lever 13 is consequently rocked out again by the cam track 122 of the cam disc 22, whereby the catch pin 88 is disconnected again from the corresponding notch 87 and the control lever 85 is moved again into its position of engagement. The drum 4 is thus freed again and coupled to the shaft 23 by means of the locking pin 79. At the same time the belt pulley 77, corresponding to slow running of the change-speed gearbox 63 is uncoupled from the respective main shaft 69 by the electrical contacts 74, 91 and the electromagnetic control device 71, while the belt pulley 78, corresponding to high speed of the change-speed gearbox 63 is coupled to the main shaft 69 and thus to the electric motor 62. The shaft 23 therefore now turns at higher speed and drives the drum 4. After a joint rotation of the shaft 23 and of the drum 4 through 180° at the higher speed, whereby the empty coin storage bore 5 is transferred from the wrapping station B to the stacking station A, the cam track 122 of the cam disc 22 frees the swinging lever 13, which swings in to engage the drum 4 and move the control lever 85 to the disconnected position. The drum 4 is therefore uncoupled from the shaft 23 again and held fast by the catch pin 88. In this position of the drum 4, the coins are introduced into the coin storage bore 5 lying at the stacking station A, while the shaft 23 continues to run at the higher speed until it completes its second revolution. At the end of this second complete revolution of the shaft 23, the high speed belt pulley 78 of the change-speed gearbox 63 is also uncoupled from the shaft 69 by the contacts 74, 91 and the shaft 23 stops in its starting position. The next operation of the machine is initiated by a new electric starting impulse from the coin delivery and counting device, and once again takes place in two complete revolutions of the main shaft 23 and a single two-stage complete revolution of the conveyor drum 4.

The embodiment shown in FIGS. 8 to 12 corresponds substantially to the machine shown in FIGS. 1 to 7, and in these figures like parts are designated by like references. The most important difference is that, in the embodiment shown in FIGS. 8 to 12, the coin storage bores 5, 105 of the conveyor drum are disposed in pairs diametrically opposite one another. The two diametrically opposite bores 5, 105 of each pair of bores have the same inside diameter. The different pairs of bores have different inside diameters, each corresponding to one type of coin. The conveyor drum 4 is provided with six pairs of diametrically opposite coin storage bores 5, 105. Consequently the machine may be used for stacking and wrapping six different types of coins. It is however possible for the conveyor drum 4 to be provided with any other number of coin storage bores disposed diametrically opposite in pairs, for example with only one pair of such bores.

The change-speed gearbox is dispensed with and the electric motor 62 drives the shaft 165 of the worm 65 in the reduction gearing 64 directly through a belt drive 200 (FIG. 11). The worm wheel 66 is connected to the shaft 23 by a freewheel coupling 201 known per se, the latter being constructed so that it couples the worm wheel 66 to the shaft 23 only in the direction of rotation F1 of the conveyor drum 4. A crank disc 202 is secured to the bottom end of the shaft 23 beneath the cam disc 60. The crank pin 203 of the disc 202 is connected to one end of a pair of springs 206 by means of a chain 205 guided around a sprocket wheel 204, the other end of the pair of springs 206 being fastened to the machine frame 1 (FIG. 12).

The coupling device 75 provided between the shaft 23 and the conveyor drum 4, as described above with reference to FIGS. 1 to 7, has likewise been modified and simplified. In the embodiment shown in FIGS. 8 to 12, the coupling device 275 includes a casing 207 which is fastened to the upper end of the shaft 23 and in which a radially directed locking pin 208 is slidably mounted

(FIG. 8). The sprung catch end 209 of the locking pin 208 co-operates with the inner notches 80 (FIG. 4) in the conveyor drum 4, while the other diametrically opposite end of the locking pin 208 has a bevelled head 210 which co-operates with a cam track 211 fastened on the machine frame 1 and extending approximately over an arc of 180°. Between an arm 212 projecting from the casing 207 and an arm 214 projecting from the locking pin 208, a tension spring 215 is stretched. The tension spring 215 urges the catch end 209 of the locking pin 208 out of the notches 80 in the drum 4 and at the same time urges the locking pin head 210 against the cam track 211.

In the starting position of the machine, the selected coin storage bore 5 together with the pile 11 of coins formed therein lies at the stacking station A, while the identical diametrically opposite coin storage bore 105 is situated at the wrapping station B. The main shaft 23, the locking pin casing 207, and the crank disc 202 assume the positions shown in FIGS. 8 and 12. The locking pin head 210 is not yet engaged by the cam track 211 and lies slightly in front of the starting end of the cam track 211. Consequently the locking pin 208 is held in the disengaged position by the spring 215 and the shaft 23 is uncoupled from the conveyor drum 4. The crank pin 203 of the crank disc 202 is positioned just before its dead centre position 203B, opposite the sprocket wheel 204, and the pair of springs 206 is almost completely tensioned.

The starting impulse supplied by the coin delivery and counting device in the stacking station A starts up the electric motor 62. The shaft 23 is consequently rotated in the direction of the arrow F1 through the worm drive 65, 66 and the freewheel coupling 201. The locking pin head 210 runs on to the stationary cam track 211 and the locking pin 208 is displaced by the cam track 211, against the force of the spring 215, into an engaged position in which the opposite locking pin end 209 engages in a notch 80 in the conveyor drum 4, this notch 80 having been initially offset slightly forwards. The shaft 23 is thereby coupled to the conveyor drum 4 and drives the latter in the direction of rotation F1. At the same time or directly afterwards, the crank pin 203 of the crank disc 202 passes through its dead centre position 203D. The crank disc 202 is consequently rotated through 180° at high speed, by the tensioned pair of springs 206 together with the shaft 23 and the conveyor drum 4 coupled thereto, until the crank pin 203 reaches its other dead centre position 203E, facing the sprocket wheel 204. This rapid rotation of the shaft 23 under the action of the crank disc 202 and of the springs 206 is therefore effected at considerably higher speed than the uniform speed of rotation of the worm wheel 66 and is made possible by the freewheel coupling 201, which enables the shaft 23 to rotate in this direction relative to the worm wheel 66.

Through the rotation of the conveyor drum 4 through 180°, the coin storage bore 5 together with the pile of coins formed therein is transferred from the stacking station A to the wrapping station B, while at the same time the diametrically opposite, empty coin stacking bore 105 is brought from the wrapping station B to the stacking station A. In this position of the conveyor drum 4, the locking pin head 210 moves away from the stationary cam track 211. The spring 215 consequently moves the locking pin 208 into its disconnected position, that is to say it pulls it out of the respective notch 80 in the drum 4. The conveyor drum 4 is thereby uncoupled from the shaft 23 and secured in its new position, for example by the sprung outer catch pin 88 (FIG. 2) or the like. The shaft 23 on the other hand is turned further in the direction of the arrow F1 at the relatively slow speed of rotation of the worm wheel 66 by the latter and by way of the freewheel coupling 201. During this slow further rotation of the shaft 23, the paper strip 38 is advanced and torn off and the pile of coins lying in the coin storage bore 5 at the wrapping station B is wrapped in the paper wrapper torn off. The edges of the paper wrapper are thereupon

folded over and the complete roll of coins is dropped out of the conveyor drum 4. At the same time a new pile 11 of coins is formed in the diametrically opposite coin storage bore 105 situated at the stacking station A. Together with the shaft 23, the cam discs 22, 60 fastened thereon also rotate and effect the formation of the pile of coins at the stacking station A, the advance of the paper strip 38, and also the wrapping and dropping of the roll of coins at the wrapping station B. At the same time the crank pin 203 together with the crank disc 202 also rotates towards its dead centre position 203E opposite to the sprocket wheel 204, whereby the pair of springs 206 is tensioned again.

After a rotation of about 180° which is performed at slow speed by the shaft 23 alone, that is to say when the shaft 23 has completed a total rotation of 360° and is once again in the starting position (FIGS. 8 and 12), the motor 62 is switched off by the cams 90, 260 of the cam discs 104 and 60 respectively, through the corresponding electrical contacts 91 and 74 respectively. The shaft 23 is consequently stopped in its starting position. The next operation of the machine is initiated by a new electric starting impulse from the coin delivery and counting device, and proceeds once again in a half revolution of the conveyor drum 4 and a single, two-stage complete revolution of the main shaft 23.

In the embodiment shown in FIGS. 8 to 12, the rotary movement of the pile 11 of coins at the stacking station A is effected on the one hand by means of the rotating bottom supporting disc 24 and on the other hand by the inner guide rolls 7 of the conveyor drum 4 which for this purpose are driven by constraint. The outer roller 17 carried by the swinging lever 13 need not be driven in this arrangement and may simply be mounted for free rotation. It then serves mainly as a guide roller and to close the outer longitudinal slot 6 of the coin storage bores 5, 105 at the stacking station A. As shown in FIGS. 8 and 9, each internal guide roller 7 of the conveyor drum 4 is provided with a friction roller 217 projecting over the drum 4. On the upper arm 113 of the swinging lever 13 is secured a curved carrier 218 which extends on both sides of the coin storage bore 5 situated at the stacking station A. At each end of the carrier 218, an angle lever 219 is mounted for rocking movement about a pivot 220. One arm of the angle lever 219 carries a rotating friction roller 221 which is driven by way of a belt drive 223 by a pulley 224 which has a stationary mounting and which is common to both friction rollers 221. The two rotating friction rollers 211 are disposed on opposite sides of the coin storage bore 5 at the packing station A and co-operate with the friction rollers 217 of the two inner guide rollers 7 associated with this coin storage bore 5. The opposite arms of the angle levers 219 are connected to the carrier 218 by respective tension springs 225.

The arrangement is such that when the swinging lever 13 is rocked in the outward direction in order to permit the rotation of the conveyor drum 4, the rotating drive rollers 221 of the angle levers 219 are lifted off the friction rollers 217 of the associated guide rollers 7. Although the drive roller arms of the angle levers 219 are urged inwards by the action of the springs 225, this rocking movement of the angle levers 219 is nevertheless limited by stops 228 on the carrier 218 which co-operate with stop screws 227 on the angle levers 219. When on the other hand the swinging lever 13 is swung inwards to engage the drum 4 during the formation of the pile of coins, the rotating drive rollers 221 of the angle levers 219 bear against the friction rollers 217 of the associated guide rollers 7, the angle levers 219 yielding resiliently, that is to say being rocked slightly against the action of the springs 225, as shown in FIG. 8. The pressure forcing the drive rollers 221 against the friction rollers 217 is thus determined by the springs 225. The two drive rollers 221 are driven in the same direction, so that they also drive the two guide rollers 7, which are associated with the

coin storage bore 5, in the same direction through the corresponding friction rollers 217.

In the embodiment shown in FIGS. 8 to 12, the pile checking device in station A is also of modified construction. In this case the pile checking device includes a plurality of horizontal contact pins 226 which are located one above the other and which are directed approximately radially to the conveyor drum 4 and to the coin storage bore 5 at the stacking station A, towards the outer longitudinal bore 6 of the latter, and are fastened through respective leaf springs 227 on a common operating lever 229 located on the outside of the swinging lever 13 (FIGS. 9 and 10). The contact pins 226 engage the coins through corresponding apertures in the casing 16 which is provided for the roller 17 and fastened on the swinging lever 13, and are slidably guided in bores in an insulator 231 fastened above the roller 17 in the casing 16. The contact pins are insulated both from one another and from the electrically conducting machine frame 1 and can be alternately connected to an electrical source. The operating lever 229 is mounted for rocking movement about the pivot 230 and at its opposite end to the contact pins 226 is connected by a spring 223 to the swinging lever 13. The lever 229 also co-operates with an electromagnetically operated striking device 234 provided on the swinging lever 13.

The arrangement is such that in the position of rest of the operating lever 229, as shown in FIG. 10, the contact pins 226 are completely withdrawn from the coin storage bore 5, that is to say are completely withdrawn into the insulator 231, and do not prevent the rotation of the conveyor drum 4. After the formation of the pile of coins in the coin storage bore 5, the electromagnetic striking device 234 is operated, the device applying an impulse to the lever 229 and rocking the latter to-and-fro in conjunction with the spring 223 in such a manner that the contact pins 226 are briefly inserted into the coin storage bore 5 through the outer longitudinal slot 6 in the latter. Depending on the predetermined height of the pile of coins, the contact pins 226 which lies directly above the pile 11 of coins is electrically energised. If the pile of coins formed has the prescribed height, the associated current conducting contact pin 226 does not come into contact with the pile of coins during its brief penetration into the coin storage bore 5, that is to say it passes over the pile, and the operation of the machine can be initiated. If on the other hand, as the result of coins which have assumed an edgewise position or as the result of an excessive number of coins introduced, the pile of coins exceeds the prescribed pile height, then the associated current conducting contact pin 226 strikes against the pile of coins, yielding resiliently, and through the electrically conductive pile of coins and the machine frame 1 conductively connected thereto closes a locking circuit which prevents the initiation of the following operation of the machine.

I claim:

1. A coin stacking and wrapping machine including a conveyor drum mounted for rotation about a vertical axis, an edge portion of said drum having a plurality of continuous axially parallel coin storage bores which are offset relative to one another and have different diameters each corresponding to one type of coin, a stacking station and a wrapping station angularly offset relative to one another around the conveyor drum, means for rotating said drum intermittently to transfer a coin storage bore from the stacking station to the wrapping station and then in the same direction of rotation back to the stacking station, means at the stacking station for introducing a predetermined number of coins from above into the coin storage bore to form a pile of coins of predetermined height in said bore, and means at the wrapping station for wrapping in a wrapper the pile of coins contained in the coin storage bore and for removing the completed roll of coins in the downward direction from the coin

storage bore, and, at the stacking station, means for rotating the pile of coins about the axis of the coin storage bore during formation of the pile of coins.

2. A machine according to claim 1 wherein at the stacking station a rotatable supporting member closes the bottom of the coin storage bore to support a pile of coins therein, said member being coaxial with the bore, and the machine including means for rotating the member.

3. A machine according to claim 1 wherein the conveyor drum has an outer vertical slot giving access to each coin storage bore, and at the stacking station a roller is mounted outside the drum for rotation about a vertical axis, the machine including means for rotating the roller and means for moving the roller towards and away from the drum and urging the roller through said slot into contact with the pile of coins in the coin storage bore.

4. A machine according to claim 1 wherein axially parallel guide rollers are rotatably mounted in bores in the conveyor drum and project through slots into the adjacent coin storage bores, said machine including outer friction rollers to each of which a guide roller is connected, and at the stacking station outside the conveyor drum at least one rotatable drive drum, means for rotating the drive drum and means for moving the drive drum away from and towards the drive drum and for urging the drive drum into contact with a friction roller.

5. A machine according to claim 1 including at the stacking station a pile testing device responsive to the height of the pile of coins in the coin storage bore to prevent the machine from operating when a predetermined pile height is exceeded.

6. A machine according to claim 5 wherein the pile testing device includes a plurality of insulated electric contacts at different heights on the inner bounding surface of the coin storage bore, and means for selectively electrically energising the contacts in accordance with the predetermined height of the pile of coins.

7. A machine according to claim 5 wherein the pile testing device includes a plurality of insulated electric contacts at different heights on the outer roller, sprung sliding contacts in conductive contact with the first-mentioned contacts, a stationary mounting for said sprung contacts, and means for selectively electrically energising the contacts in accordance with the predetermined height of the pile of coins.

8. A machine according to claim 5 wherein the pile testing device includes a plurality of approximately horizontal resilient contacts at a distance from and above one another, and means for introducing the contacts, after the formation of the pile of coins in the coin storage bore, briefly into said bore from the outside thereof through an outer slot in the conveyor drum in an approximately radial direction.

9. A machine according to claim 1 including at the wrapping station and beneath the conveyor drum a movably mounted supporting member for supporting the pile of coins contained in the coin storage bore, and means for adjusting the member to be coaxial with the coin storage bore and for withdrawing the member from the region of the coin storage bore to allow discharge of the roll of coins.

10. A machine according to claim 1 including a wrapping roller engageable with a pile of coins in a coin storage bore at the wrapping station, means for rotating the wrapping roller, a reel of wrapping material, a feed device and a stationary cutter, the feed device being operable to draw off intermittently a wrapping strip from the reel, introduce the strip into the coin storage bore at the wrapping station through an outer slot in the conveyor drum and associated with said bore, and insert the strip between the pile of coins in said bore and the wrapping roller, said rotating means then operating to cause the wrapping roller to divert the strip from its feed path against the cutter to separate the strip from the reel.

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11. A machine according to claim 10 wherein the feed device includes a clamp jaw gripper and means for moving the gripper to-and-fro in the feed path of the strip, said gripper being closed during the feed movement and open during the return movement.

12. A machine according to claim 11 wherein the gripper includes a pair of swingably-mounted scissors type levers, and the machine includes a driver member which forwardly drives and closes the gripper and a return spring which returns and opens the gripper.

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References Cited

UNITED STATES PATENTS

2,855,739	10/1958	Schoenewolf	-----	53—212
3,000,160	9/1961	Speggiorin	-----	53—212

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