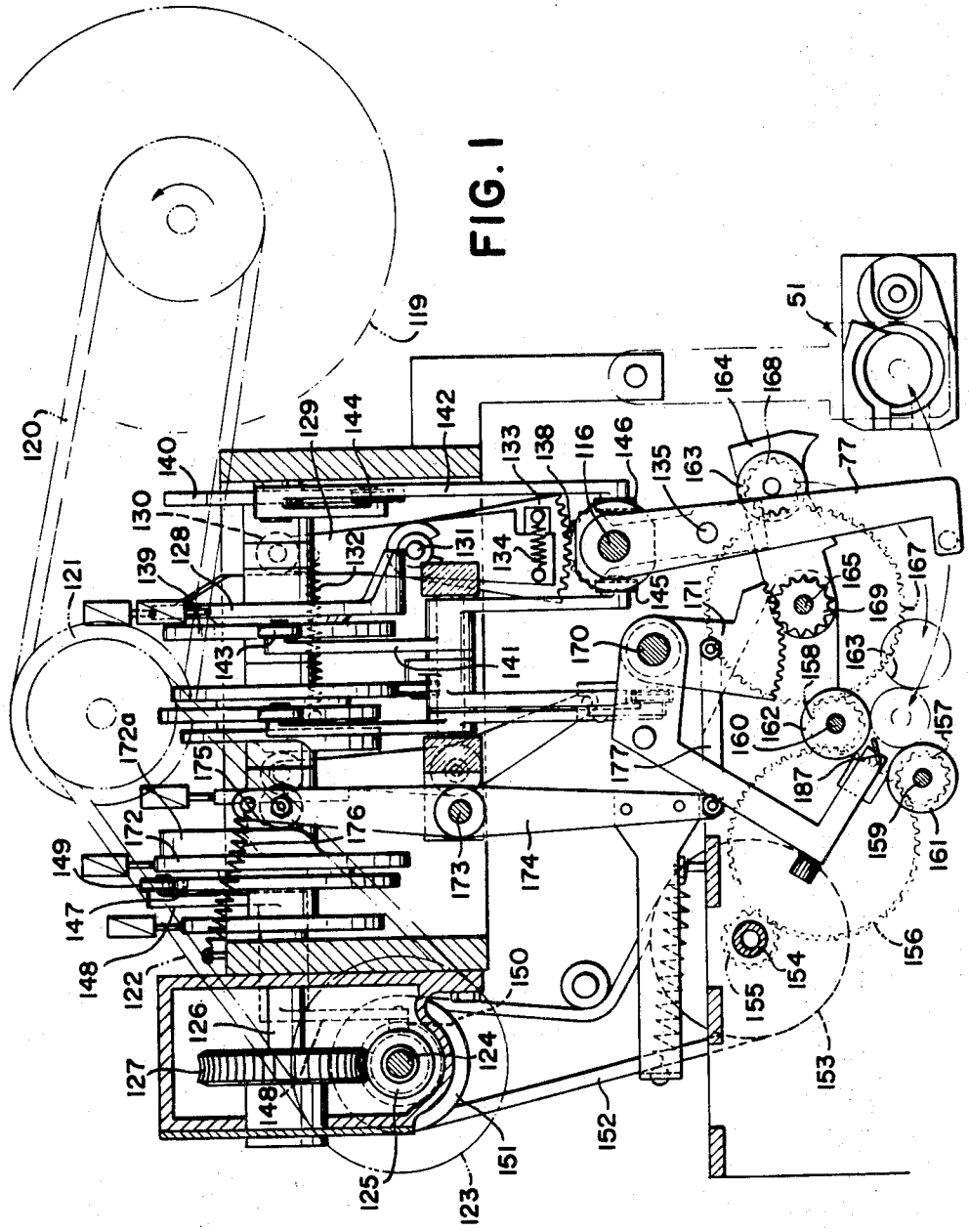
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COIN WRAPPING APPARATUS

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FIG. 1



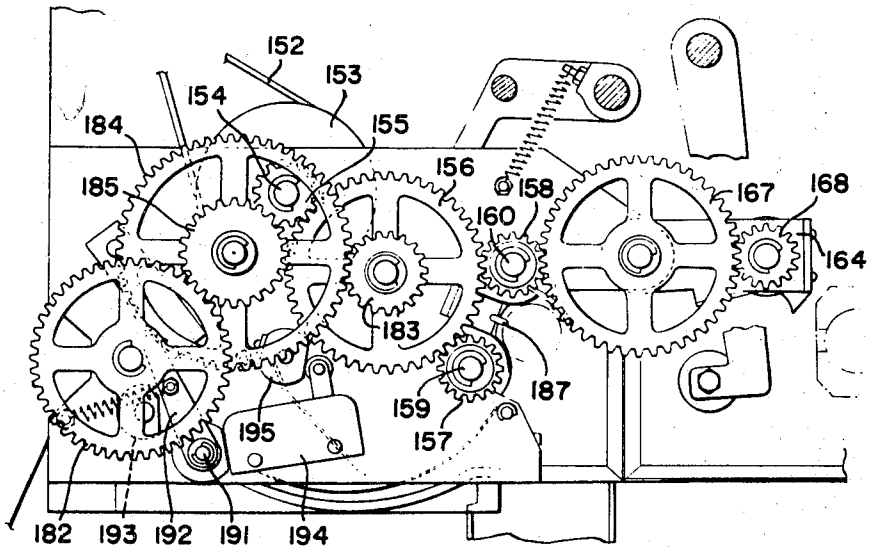

152
153
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191
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FIG. 2

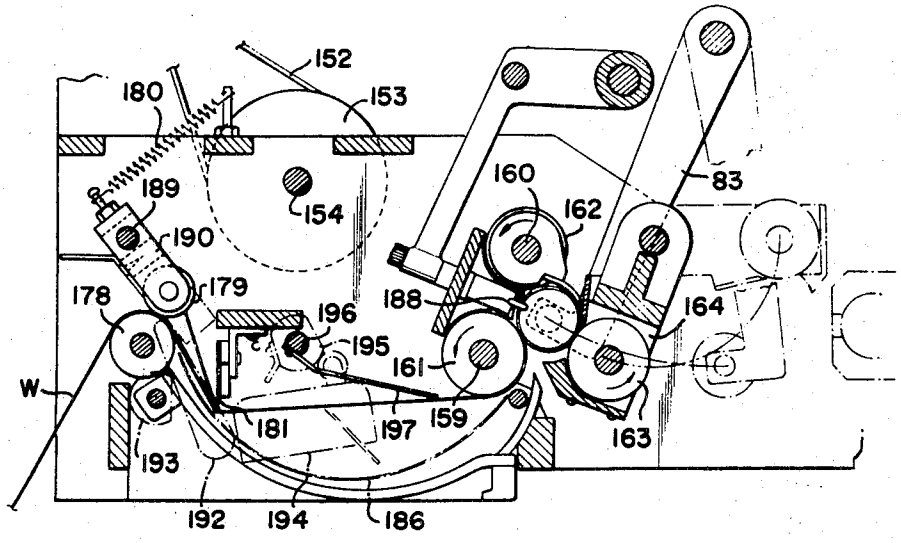

152
180
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189
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160
83
162
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178
179
188
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196
195
161
W
181
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159
163
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194
186

FIG. 3

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COIN WRAPPING APPARATUS

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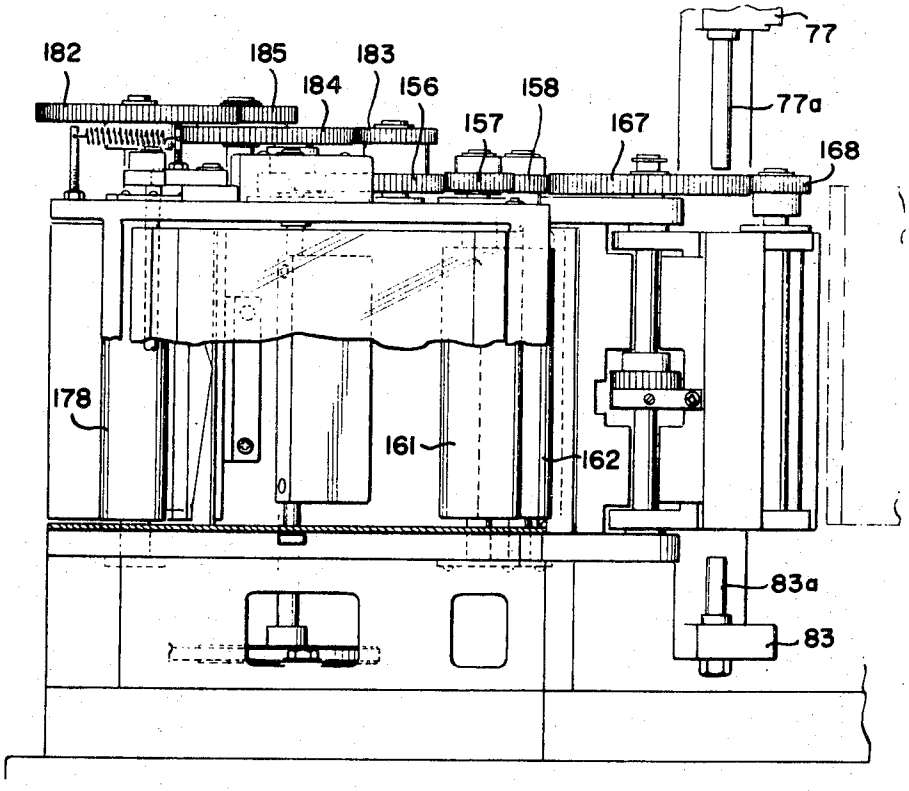


FIG. 4

United States Patent Office 3,531,913 Patented Oct. 6, 1970

3,531,913

COIN WRAPPING APPARATUS

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Filed Oct. 26, 1967, Ser. No. 678,272
Claims priority, application Japan, Oct. 27, 1966, 41/99,702
Int. Cl. B65b *11/04*
U.S. Cl. 53—212 4 Claims

ABSTRACT OF THE DISCLOSURE

A coin wrapping apparatus in which two arms swing pivotally between a coin accumulating device and a wrapping station whereat two wrapping rollers engage the stack or roll of coins, a pressing roller being provided which swings between an inactive position and an active position in which it holds the roll of coins against the wrapping rollers. Cams are provided which actuate levers causing the roll transporting arms to swing back and forth and which also cause the arms to spread apart so that the roll of coins can be bracketed axially and grasped between the arms. Further cams are provided which actuate the wrapping rolls and which move the pressing roller as required. Still further cams are provided to operate the source of wrapping material.

DRAWINGS

FIG. 1 is a top plan view showing the details of a wrapping mechanism provided in accordance with one embodiment of this invention;

FIG. 2 is a top plan view showing a driving portion for the wrapping mechanism of FIG. 1;

FIG. 3 is a top plan view corresponding to FIG. 2 but showing the interior arrangement of wrapping rollers and a wrapping paper feed mechanism; and

FIG. 4 is a front elevational view, partly broken away, of the wrapping mechanism of this invention.

DETAILED DESCRIPTION

The present invention relates to an apparatus for wrapping coins, stacked in a cylindrical shape, with a sheet material, and more particularly to a mechanism for driving the wrapping rollers in said apparatus.

Conventional coin stack wrapping apparatus generally includes wrapping rollers which act to pinch the peripheral wall of a cylindrical coin stack from three directions and which trail a wrapping paper around said coin stack. Two of these rollers are usually driven from suitable drive means and the remaining one, which is an idling roller, is rotated by the coin stack as said coin stack is rotated by said first two rollers. In order to cause the third roller to rotate positively and thereby to trail the wrapping paper around the coin stack smoothly, said third roller is pressed against the coin stack with an extremely large force. This makes it extremely difficult to detach the idling roller from the coin stack manually so as to remove wrapping paper which may have jammed between the coin stack and said idling roller.

It is a primary object of the present invention eliminate the foregoing drawback characteristic of conventional coin wrapping apparatus.

Other objects, features and advantages of the present invention will become apparent from the following detailed description when taken in conjunction with the accompanying drawings.

Referring first to FIG. 1, the coin stack wrapping apparatus includes a pair of swingable and vertically movable gripping levers **77** and **83** arranged one above another. These levers respectively carry gripping pins **77***a* and **83***a* at their free ends and are adapted to make a swinging motion about the axis of a mounting pin thereof, so that the gripping pins are shifted from their respective gripping positions, above and below a coin accumulating or stacking cylinder **51**, to a wrapping position or station upon clockwise swinging of said levers, or vice versa. The levers **77** and **83** are also movable in a vertical direction. These levers are slidably and rotatably mounted on a vertical guide post **116** and are urged upwardly and downwardly respectively by springs (not shown).

A mechanism to operate the levers **77** and **83** is shown in FIG. 1. This mechanism includes a motor **119** which drives a pulley **123** through a belt **120**, a pulley **121** and a belt **122**. The pulley **123** is rotatably mounted on the top end of a shaft **124** and may be operatively connected to said shaft **124** by a clutch (not shown), which clutch is operated by a solenoid (not shown). The shaft **124** is provided with a worm gear **125** which engages a gear **127** mounted on a horizontal shaft **126**. The horizontal shaft **126** has a cam **128** fixedly mounted thereon, whose cam surface is in engagement with a cam driven roller or follower **130** carried at one end of a lever **129** which is pivotable about a pin **131** in a horizontal plane. The lever **129** is urged to rotate counterclockwise by a spring **132** so that the roller **130** may be held in pressure contact with the cam surface of the cam **128**. The pin **131** also has a gear sector **133** pivotally mounted thereon, and the lever **129** and the gear sector **133** are flexibly connected with each other by a spring **134**.

A vertical guide pin **135** extends through the levers **77** and **83**, and at the root portions of said lever **83**, a gear **138**, concentric with the post **116**, which is in engagement with the sector gear **133**, is provided. When a predetermined number of coins are fed into the stacking cylinder **51**, an electrical signal is generated to actuate the aforementioned electromagnetic clutch, whereby the pulley **123** and the shaft **124** are coupled, enabling the drive of the motor **119** to be transmitted to the horizontal shaft **126**. As a result, the cam **128** is rotated causing the levers **77** and **83** to rotate about the post **116**.

The shaft **126** also has cams **139** and **140** fixedly mounted thereon, whose cam surfaces are in engagement with cam driven rollers or followers **143** and **144** respectively which are carried at ends of levers **141** and **142** pivotally mounted on respective horizontal pins. The levers **141** and **142** carry at the other ends thereof rollers **145** and **146** respectively which are adapted to engage the root portions of the levers **83** and **77**, to cause the lever **83** to move downwardly and the lever **77** upwardly The configuration of the cams **139** and **140** are so selected that the rollers **145** and **146** may be moved upwardly and downwardly respectively when the levers **77** and **83** are rotated counterclockwise, under the action of the cam **128**, and positioned above and below the coin stack formed in the stacking cylinder **51** respectively. Thus, the levers **77** and **83** are moved towards each other in these positions, under the biasing forces of springs (not shown), gripping the coin stack with the pins **77***a* and **83***a*. Thereafter, the levers **77** and **83** are rotated clockwise about the post **116** under the action of cam **128**.

Also mounted on the shaft **126** is a cam **147** whose cam surface is in engagement with a cam driving roller **149** carried at the free end of one of two arms of a lever **148** which is adapted to rotate about a horizontal pin. The free end **150** of the other arm of the lever **148** is in engagement with a clutch (not shown) which is provided at the lower end of the shaft **124** for coupling said shaft **124** with a pulley **151**. Thus, when the roller **149** is depressed by the cam **147**, the free end **150** of the

lever 148 is moved upwardly to bring the clutch into an engaged position, thereby coupling the shaft 124 with the pulley 151. The drive from the motor 119 is thus transmitted to a pulley 153 through the pulley 151 and a belt 152. The shaft 154 on which the pulley 153 is mounted, has mounted thereon a gear 155 which meshes with a gear 156 and the gear 156 in turn meshes with a pair of spaced gears 157 and 158. Pins 159 and 160 on which the gears 157 and 158 are mounted, have wrapping rollers 161 and 162 mounted thereon respectively as shown in FIG. 1. The coin stack gripping levers 77 and 83 are arranged to operate such that, when they rotate clockwise as viewed in FIG. 1, with a coin stack gripped therebetween, they bring the coin stack to a contacting position with the rollers 161 and 162, indicated by the chain line in FIG. 1.

A third roller, namely a press or pressing roller 163, is rotatably mounted on a pair of upper and lower arms 164, of which only one is shown in FIG. 1 and which are pivotally mounted on a pin 165 at ends thereof. On the pin 165 is mounted a gear 167 which engages the gear 158 provided on the roller 162. The roller 163 is provided with a gear 168 which is in engagement with the gear 167. Also mounted on the pin 165 is a gear 169 which is adapted to rotate integrally with the arms 164. The gear 169 is in engagement with a gear sector 171 pivotally mounted on a shaft 170.

The shaft 126 also has a cam 172 mounted thereon whose cam surface 172*a* is in engagement with a cam driven roller 175 carried at one end of a lever 174 which is pivotable about a vertical pin 173. A spring 176 is provided so as to keep the roller 175 in pressure contact with the cam surface 172*a*. The other end of the lever 174 is articulated to the sector gear 171 through a link 177. Thus, it will be seen that, when the lever 174 is rocked by the cam 172, the gear 169 is caused to rotate by way of the sector gear 171, so that the gear 168 and therefore the roller 163 are moved along the periphery of the gear 167. The configuration of the cam surface 172*a* of the cam 172 is selected such that the roller 163 travels clockwise about the pin 165 along the periphery of the gear 167 to a position indicated by the chain line in FIG. 1, after the coin stack has been brought to the contacting position with the rollers 161 and 162 by the gripping levers 77 and 83 upon clockwise rotation of said gripping levers.

The wrapping web feed mechanism includes a positive driven roller 178 and a press roller 179 bearing against said roller 178 under the biasing force of a spring 180, and a wrapping web material W is delivered by the roller 178 through the nip between said rollers 178 and 179. Between the feed roller 178 and the wrapping roller 161 is arranged a substantially arcuate guide plate 186 to guide the web material W towards the roller 161. A cutting knife 181 is disposed adjacent the feed roller 178 in closely spaced relation to the guide plate 186. The feed roller 178 has a gear 182 mounted thereon which is driven from the gear 156 through gears 183, 184 and 185.

With the wrapping mechanism constructed as described above, when the shaft 126 is driven by the drive from the motor 119 through the shaft 124, the levers 77 and 83 are first moved to the coin stack gripping positions under the action of the cam 128 and then moved towards each other by the cams 139 and 140, gripping the coin stack between the pins 77*a* and 83*a*. Upon gripping the coin stack, the levers are further moved to carry the coin stack to the contacting position with the wrapping rollers 161 and 162 as indicated by the chain line in FIG. 1. Then, the roller 163 is moved along the periphery of the gear 167 to the position indicated by the chain line in FIG. 1 by the action of the cam surface 172*a* of the cam 172, thus holding the coin stack between it and the rollers 161 and 162. At the same time, the clutch to couple the shaft 124 with the pulley 151 is brought into an engaged position by the action of the cam 147, enabling the drive of the motor to be transmitted to the rollers 178 and wrapping rollers 161, 162 and 163, through the belt 152, pulley 153 and the gear train. The wrapping web material W is fed onto the roller 178 and is tightly wound on the coin stack by the action of the roller 161, 162 and 163.

In the conventional apparatus of this type, a press roller, corresponding to the roller 163, is an idler roller, which is rotated by the rotating coin stack to trail the web material around the coin stack. Therefore, in order to obtain a positive rotation of the press roller by engagement with the rotating coin stack, it has been necessary to press the press roller against the coin stack with a strong force and accordingly a large force has been required for driving the wrapping rollers. In addition, it has been extremely difficult to manually detach the press roller from the coin stack for removing the wrapping web material which has jammed between said press roller and the coin stack. In the apparatus according to the present invention, however, since the press roller 163 is driven positively, the force to press the press roller 163 is not required to be so large as that in the conventional apparatus and moreover, since the driving force to drive the press roller 163 has a component thereof acting to press said roller against the coin stack, only a very small force is required to press the roller 163 against the coin stack. Therefore, when jamming of the wrapping web material occurs, the press roller 163 can be manually detached from the coin stack with ease, upon stopping the machine operation.

A beading device of the known type comprising a pair of vertically spaced hooks, consisting of an upper hook 187 as shown in FIGS. 1 and 2 and a lower hook 188 as shown in FIG. 3, is provided between the rollers 161 and 162. These hooks 187 and 188 serve to form beads of the web material at the upper and lower ends of the rotating web material wrapped around the coin stack in a cylindrical shape, so as to prevent unwrapping of the packaged coin stack. Thus, the packaging of the coin stack is completed.

Although the present invention has been illustrated and described hereinabove in terms of specific embodiment thereof, it is to be understood that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. Coin wrapping apparatus comprising means for accumulating a roll of coins, transport means for transporting the roll to a wrapping station, rotatable wrapping rollers supported at fixed locations at said wrapping station to receive said roll, supply means supplying a wrapping material to said rollers for application to said roll, a pressing roller, control means for selectively moving said pressing roller away from and to said wrapping station to enable the roll to be applied readily against said wrapping rollers and then to retain the roll against the latter said rollers, and means directly driving the wrapping and pressing rollers to effect the wrapping of said roll, said transport means including arms for bracketing and axially engaging said roll, means to displace said arms between the first said means and said wrapping station, and means to spread the arms apart en route to the first said means to permit the bracketing of said roll, said control means including a lever pivotably supporting said pressing roller, a gear coupled to said lever to pivot the same, a gear segment engaging said gear, a cam, a cam follower engaging said cam, a pivoted lever coupled to said cam follower, and a link coupling said segment to the latter said lever whereby said segment is operated to rotate said gear and move the first said lever, said apparatus further comprising a drive gear coupled to said pressing roller, and a further gear engaged by said drive gear and about which the drive gear rotates as the pressing roller is moved to and away from said wrapping station, said means for

driving the pressing and wrapping rollers including a gear train driving said further gear.

2. Apparatus as claimed in claim 1, wherein the means for driving the rollers includes a cam, a cam follower engaging the latter said cam, a drive shaft, a pulley system coupled to said gear train, and means responsive to the latter said cam follower for coupling the pulley system to said drive shaft.

3. Apparatus as claimed in claim 2 comprising a shaft driven by said drive shaft and supporting all of said cams.

4. Apparatus as claimed in claim 3, wherein said gear train is coupled to and operates said supply means, said

supply means including an arcuate guide leading said material to said wrapping rollers.

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