

June 10, 1930.

J. O. McKEAN

1,763,246

PACKAGE WINDING MACHINE

Filed Dec. 29, 1927.

4 Sheets-Sheet 2

Fig. 2.

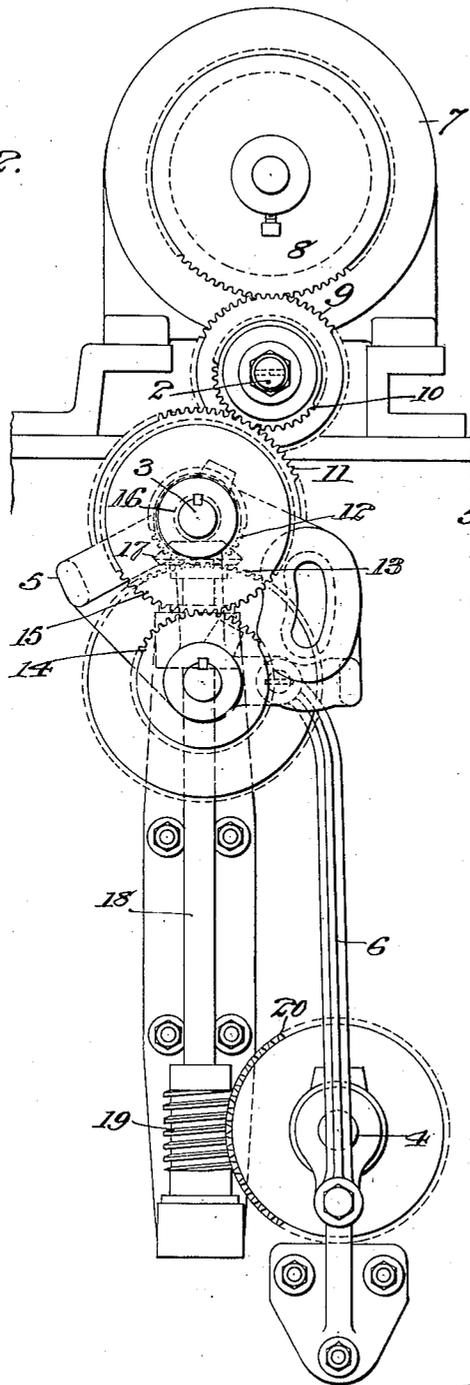
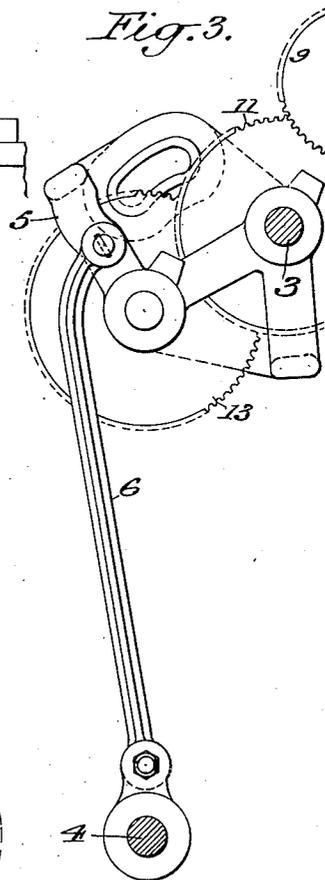


Fig. 3.



INVENTOR

John O. McKean

BY

Howard Ward

ATTORNEYS

June 10, 1930.

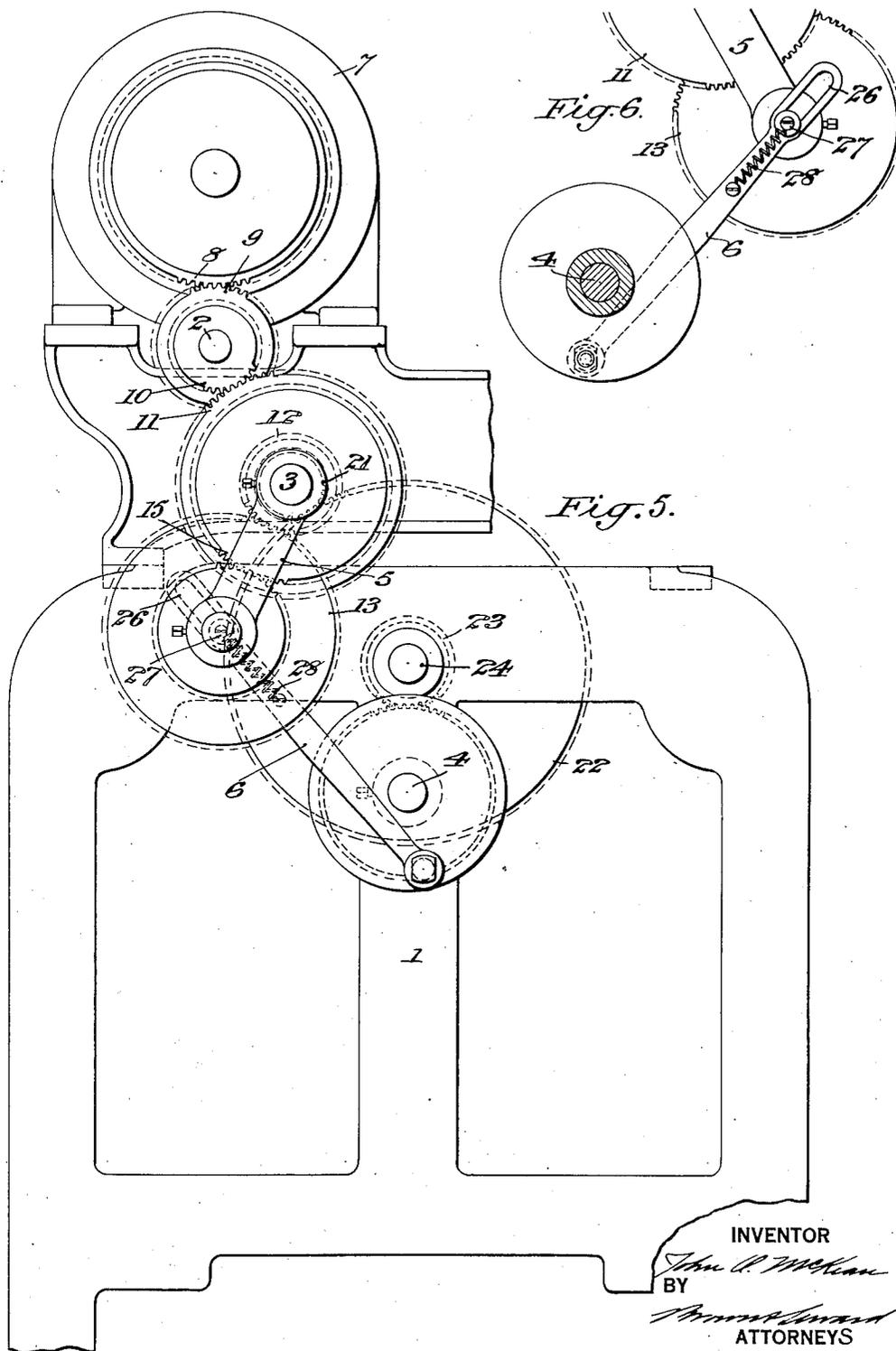
J. O. McKEAN

1,763,246

PACKAGE WINDING MACHINE

Filed Dec. 29, 1927

4 Sheets-Sheet 4



INVENTOR
John O. McKean
BY
Montgomery
ATTORNEYS

UNITED STATES PATENT OFFICE

JOHN O. MCKEAN, OF WESTFIELD, MASSACHUSETTS, ASSIGNOR TO FOSTER MACHINE COMPANY, OF WESTFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

PACKAGE-WINDING MACHINE

Application filed December 29, 1927. Serial No. 243,323.

The object of my invention is to provide novel and simple mechanism for breaking up the ribbon wind or the tendency of the yarn to lay one turn upon a preceding turn, thereby causing undesirable lumps or protuberances to be formed in the wound package.

My invention comprises generally a winding shaft which winds the package by surface contact therewith, is driven at a constant speed and in which the traverse guide actuating cam shaft is driven at varying speeds, utilizing a member mounted to oscillate about the cam shaft, said oscillating member being connected to a crank member driven by the cam shaft, the cam shaft in turn being driven by the winding roll shaft through the oscillating member.

My invention more specifically comprises a reduction gearing connecting the winding roll shaft with the cam shaft and a second reduction gearing connecting the cam shaft with the crank member so that a very slow movement is imparted to the oscillating member which carries a portion of the reduction gearing between the winding roll shaft and the cam shaft.

One embodiment of my invention also contemplates the use of a yielding connection between the crank member and the oscillating member, said yielding connection acting as a shock absorber for reducing the shock on the gears incident to the operation of the winding mechanism.

Practical embodiments of my invention are represented in the accompanying drawings, in which

Fig. 1 represents a detail side view of a winding machine with one embodiment of my improved driving mechanism applied thereto.

Fig. 2 represents an end view of the same.

Fig. 3 represents a detail section taken in the plane of the line III—III of Fig. 1, looking in the direction of the arrows with the oscillating member in another position from that shown in Figs. 1 and 2.

Fig. 4 represents a detail side view of a winding machine with another embodiment

of my improved driving mechanism applied thereto.

Fig. 5 represents an end view of the same.

Fig. 6 represents a detail section taken in the plane of the line VI—VI of Fig. 4, looking in the direction of the arrows with the oscillating member in another position from that shown in Figs. 4 and 5.

In both embodiments the winding machine frame is denoted by 1 and in this frame are rotatably mounted the winding roll shaft 2, the traverse guide actuating cam shaft 3 and the yoke oscillating crank shaft 4. The yoke 5 freely swings on the cam shaft 3 and is oscillated by the crank shaft 4, through a connecting rod 6.

The winding roll shaft 2 is driven at a constant speed from the motor 7, through the gears 8 and 9 fast on the motor shaft and the winding roll shaft respectively.

The cam shaft 3 is driven from the winding roll shaft 2 through a train of reduction gearing which includes a gear 10 fast on the winding roll shaft, a pair of reduction idler gears 11 and 12 loosely mounted on the cam shaft 3 and connected for rotation together, a pair of reduction idler gears 13 and 14 carried by the oscillating yoke 5 and connected for rotation together, and a gear 15 fast on the cam shaft 3.

In the embodiment illustrated in Figs. 1 to 3 inclusive, the yoke oscillating crank shaft 4 is driven from the cam shaft 3 through a reduction gearing which includes a bevel gear 16 meshing with a bevel gear 17 carried by the upper end of a vertical shaft 18, the lower end of which shaft is provided with a worm 19 which meshes with a worm gear 20 carried by the crank shaft 4.

In the embodiment illustrated in Figs. 4 to 6 inclusive, the yoke oscillating crank shaft 4 is driven from the cam shaft 3 through a reduction gearing which includes a gear 21 fast on the cam shaft, a pair of reduction idler gears 22 and 23 rotatably mounted on the axle 24, and a gear 25 fast on the crank shaft.

To lessen the shock on the gearing, due to the oscillation of the yoke 5 by the crank shaft 4, I yieldingly connect the connecting rod 6

to the yoke 5, in the present instance by providing the connecting rod with an elongated slot 26, through which a pin 27 on the yoke passes, a tension spring 28 having one end attached to said pin and the other end attached to the connecting rod.

From the above description it will be seen that by driving the cam shaft through gears on an oscillating member, said member being oscillated by a crank shaft driven from the cam shaft, the cam shaft is driven at varying speeds. This is accomplished by reason of the fact that when the yoke 5 swings in the same direction as gear 11 revolves, the speed of gear 15 is reduced, and when the yoke is swung in the opposite direction the speed of gear 15 is increased. It will also be seen that by driving the cam shaft at varying speeds, the tendency of the yarn to lay one turn upon a preceding turn is eliminated and the so called ribbon wind is broken up. The formation of undesirable lumps or protuberances in the wound package is also eliminated.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention; and hence, I do not intend to be limited to the particular embodiment herein shown and described, but

What I claim is:—

1. In a winding machine, a main drive, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the main drive and the oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a driving connection between the crank member and oscillating member and a driving connection between the cam shaft and crank member.

2. In a winding machine, a main drive, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the main drive and the oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a yielding driving connection between the crank member and oscillating member and a driving connection between the cam shaft and crank member.

3. In a winding machine a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the winding roll shaft and oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a driving connection between the cam shaft and crank member and

a driving connection between the crank member and the oscillating member.

4. In a winding machine a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the winding roll shaft and oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a driving connection between the cam shaft and crank member and a yielding driving connection between the crank member and the oscillating member.

5. In a winding machine, a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a crank member, a driving connection between the crank member and said oscillating member, gearing operatively connecting the crank member with the cam shaft, and gearing operatively connecting the cam shaft with the winding roll shaft through the oscillating member.

6. In a winding machine, a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a crank member, a yielding driving connection between the crank member and said oscillating member, gearing operatively connecting the crank member with the cam shaft, and gearing operatively connecting the cam shaft with the winding roll shaft through the oscillating member.

7. In a winding machine, a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a crank member, a driving connection between the crank member and said oscillating member, gearing operatively connecting the crank member with the cam shaft, and reduction gearing operatively connecting the cam shaft with the winding roll shaft through the oscillating member.

8. In a winding machine, a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a crank member, a yielding driving connection between the crank member and said oscillating member, gearing operatively connecting the crank member with the cam shaft, and reduction gearing operatively connecting the cam shaft with the winding roll shaft through the oscillating member.

9. In a winding machine, a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at vary-

70

75

80

85

90

95

100

105

110

115

120

125

129

ing speeds including, a member mounted to oscillate about the cam shaft, a crank shaft, a driving connection between the cam shaft and crank shaft, a driving connection between the crank shaft and said oscillating member, a winding roll shaft gear, a cam shaft gear, and idler gears on the cam shaft and on the oscillating member connecting the winding roll shaft gear with the cam shaft gear.

10. In a winding machine, a constant speed winding roll shaft, a traverse guide actuating cam shaft and means for driving it at varying speeds including a member mounted to oscillate about the cam shaft, a crank shaft, a driving connection between the cam shaft and crank shaft, a yielding driving connection between the crank shaft and said oscillating member, a winding roll shaft gear, a cam shaft gear, and idler gears on the cam shaft and on the oscillating member connecting the winding roll shaft gear with the cam shaft gear.

11. In a winding machine, a winding roll shaft, means for driving it at a constant speed, a traverse guide actuating cam shaft and means for driving it at varying speeds comprising, a member mounted to oscillate about the cam shaft, a crank shaft, a driving connection between the crank shaft and said oscillating member, a winding roll shaft gear, a cam shaft gear, and idler gears on the cam shaft and on the oscillating member connecting the roll shaft gear with the cam shaft gear, and gearing operatively connecting the crank member with the cam shaft comprising an intermediate shaft having a worm and gear connection with the crank shaft and a bevel gear connection with the cam shaft.

12. In a winding machine, a winding roll shaft, means for driving it at a constant speed, a traverse guide actuating cam shaft and means for driving it at varying speeds comprising, a member mounted to oscillate about the cam shaft, a crank shaft, a yielding driving connection between the crank shaft and said oscillating member, a winding roll shaft gear, a cam shaft gear, and idler gears on the cam shaft and on the oscillating member connecting the roll shaft gear with the cam shaft gear, and gearing operatively connecting the crank member with the cam shaft comprising an intermediate shaft having a worm and gear connection with the crank shaft and a bevel gear connection with the cam shaft.

13. In a winding machine, a main drive, a traverse guide actuating cam shaft, and means for driving it at varying speeds including a driving gear and a driven gear rotatable on the same axis, a third gear driven from the driving gear, a fourth gear driven from the third gear and driving the driven gear, and means for oscillating said third and

fourth gears about the axis of the driving and the driven gears.

14. In a winding machine, a main drive, a traverse guide actuating cam shaft, and means for driving it at varying speeds including a driving gear loosely mounted on the cam shaft, a driven gear fast on the cam shaft, a third gear driven from the driving gear, a fourth gear driven from the third gear and driving the driven gear, and means for oscillating said third and fourth gears about the axis of the cam shaft.

15. In a winding machine, a main drive, a traverse guide actuating cam shaft, and means for driving it at varying speeds including a driving gear and a driven gear rotatable on the same axis, a member mounted to oscillate about the axis of the driving and the driven gears, connected third and fourth gears mounted on said member and meshing respectively with the driving and driven gears, and means for oscillating said member about the axis of the driving and the driven gears.

16. In a winding machine, a main drive, a traverse guide actuating cam shaft, and means for driving it at varying speeds including a driving gear loosely mounted on the cam shaft, a driven gear fast on the cam shaft, a member mounted to oscillate about the axis of the cam shaft, connected third and fourth gears mounted on said member and meshing respectively with the driving and driven gears, and means for oscillating said member about the axis of the cam shaft.

17. In a winding machine, a main drive, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the main drive and the oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a driving connection between the crank member and said oscillating member, and gearing operatively connecting the crank member with the cam shaft.

18. In a winding machine, a main drive, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the main drive and the oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a yielding driving connection between the crank member and said oscillating member, and gearing operatively connecting the crank member with the cam shaft.

19. In a winding machine, a main drive, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the main drive and the oscillating member,

a driving connection between the oscillating member and cam shaft, a crank member, a driving connection between the crank member and said oscillating member, and reduction gearing operatively connecting the crank member with the cam shaft.

20. In a winding machine, a main drive, a traverse guide actuating cam shaft and means for driving it at varying speeds including, a member mounted to oscillate about the cam shaft, a driving connection between the main drive and the oscillating member, a driving connection between the oscillating member and cam shaft, a crank member, a yielding driving connection between the crank member and said oscillating member, and reduction gearing operatively connecting the crank member with the cam shaft.

In testimony that I claim the foregoing as my invention, I have signed my name this 24th day of Dec., 1927.

JOHN O. McKEAN.

25

30

35

40

45

50

55

60

65