

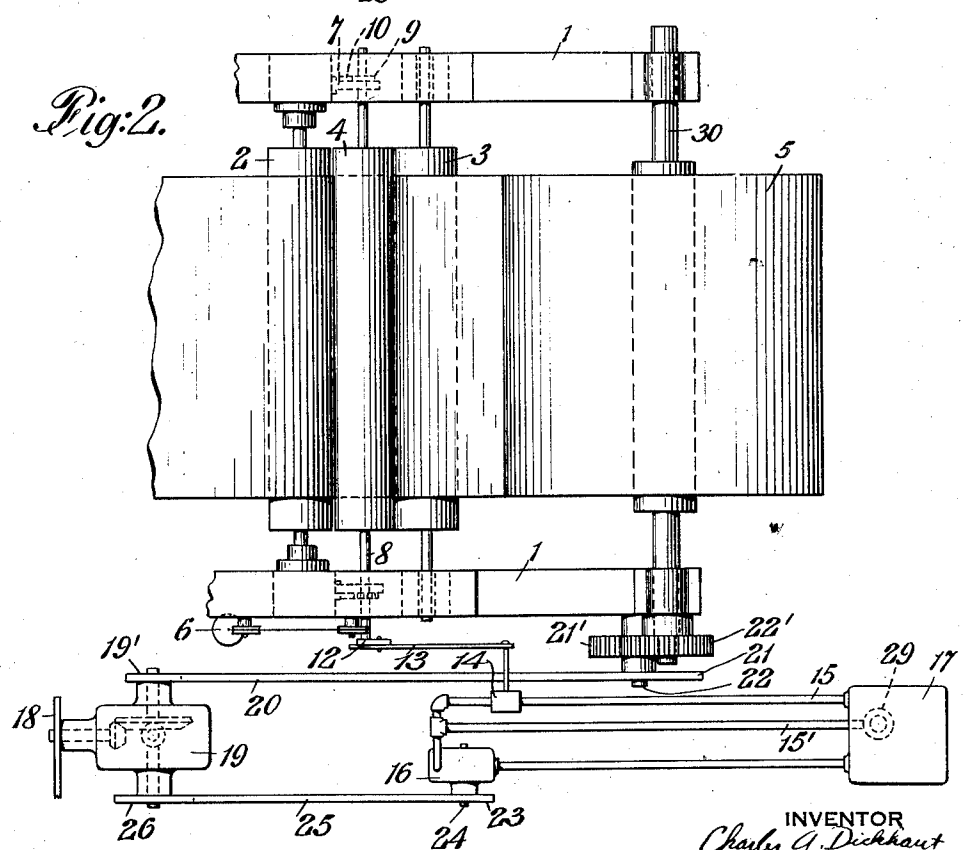
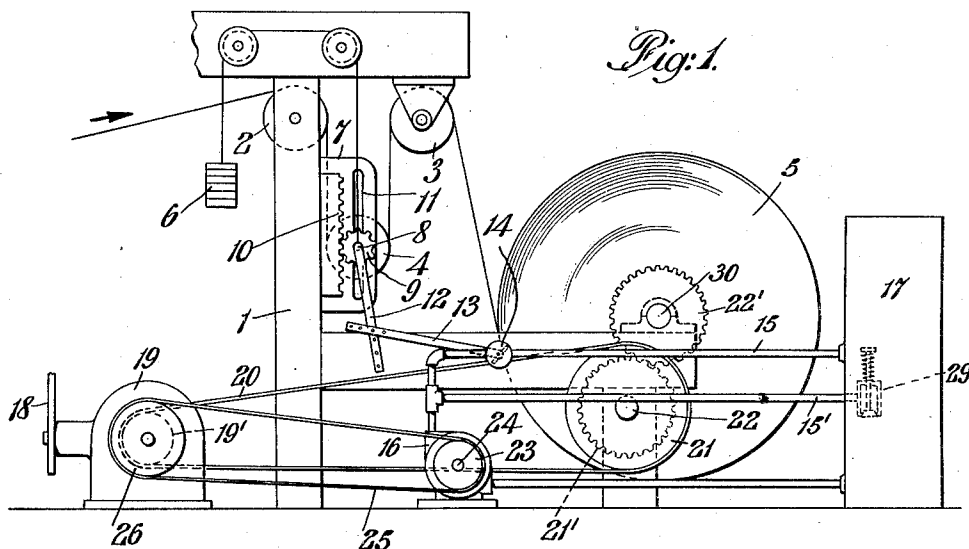
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REWINDING MACHINE

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REWINDING MACHINE

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5 Claims. (Cl. 242—75)

This invention relates to a rewinding machine.

In processing paper, textiles and the like the product being in long strips must be rewound after the processing. Processing having been speeded up under modern methods the rewinding must be capable of rewinding the product satisfactorily at relatively high speeds. As the roll of the product increases, if the speed of rotation of the rewind shaft remains constant, the surface speed of the product increases thereby increasing the tension of the product until it breaks or binds. It is therefore desirable to maintain the product under constant tension.

One of the objects of the invention is to provide a rewinding machine that will satisfactorily rewind paper, textiles and the like at relatively high speeds.

Another object of the invention is to provide a rewinding machine that will maintain the product under constant tension.

Referring to the drawing:

Figure 1 is a view in side elevation of a rewinding machine embodying the principles of my invention.

Figure 2 is a plan view of Figure 1.

In carrying out my invention, I provide a frame 1 to support rolls 2, 3. The product coming from the processing passes over idler roll 2, under floating roll 4 and over roll 3 and thence around rewind 5. Floating roll 4 measures the amount of tension which the sheet is actually carrying. To vary the amount of tension applied to the sheet, counter weights 6 are provided for roll 4 thereby either balancing roll 4, or applying a portion of the pressure of roll 4 or the full weight of floating roll 4 may be utilized by removing all the weights.

Frame 1 carries supports 7 which have slots 11 therein for the ends of shaft 8 of roll 4 to permit travel up and down of roll 4 but to maintain roll 4 parallel to rolls 2 and 3. Roll 4 is free to revolve on its shaft 8 which latter has gears 9 at each end which mesh in racks 10 on supports 7. Secured to shaft 8 to rotate therewith is link 12 pivotally connected to link 13. The latter operates butterfly valve 14. The movement of roll 4 up and down causes gears 9 to be rotated by racks 10 thereby rocking lever 13 to open or close the butterfly valve 14. The latter is in the line 15 between the small rotary pump 16 and oil reservoir 17. Oil reservoir 17 has safety relief valve 29 in line 15' between rotary pump 16 and reservoir 17. Rotary pump 16 circulates oil from tank 17 returning the oil to the tank 17 through

butterfly valve 14. The position of the butterfly valve 14 determines whether the pump runs free when the valve is wide open or acts as a brake when the valve is closed. The rewinder is driven as follows:

Power is applied through sprocket 18 which drives through a differential unit 19, sprocket 19', and through chain 20 sprocket 21 on shaft 22, which carries gear 21' driving gear 22' on rewind shaft 30. Rotary pump 16 is driven through sprocket 23 on shaft 24 by chain 25 driven by sprocket 26 of differential unit 19.

The speed of chain 20 therefore will depend upon the amount of braking applied to chain 25 by pump 16. The amount of braking of pump 16 is likewise determined by the positioning of butterfly valve 14 which in turn is dependent upon the upward or downward movement of roll 4. As the tension tends to increase, roll 4 tends to rise causing valve 14 to open to release the braking action to relieve the tension while if the tension decreases, roll 4 tends to fall causing valve 14 to close to cause the pump to act as a brake.

In utilizing the constant pressure rewinding mechanism at a constant tension, say of twenty pounds pull on the web, the oil pressure gauge will show a pressure of ten pounds per square inch at the commencement of the winding operation, using a three inch core, and the oil pressure will gradually increase to twenty pounds pressure per square inch for a finished roll diameter of twenty inches.

It will thus be seen that I have invented a rewinding mechanism for paper textiles and the like, which will function at relatively high speed and automatically maintain a constant predetermined tension on the material being rewound regardless of the increase in diameter of the roll of rewound material. Various modifications in specific detail may be made such as the design of the valve, differential, etc., and still fall within the scope of my invention.

What I claim is:

1. In a constant tension winding machine, a winding roll, rotating means for said winding roll, a differential, means for driving the differential, a rotary oil pump, an oil reservoir, connections between said rotary pump and said oil reservoir, a valve in said connections, said differential driving said rotary oil pump, said differential driving said rotating means for said windup roll, and means for controlling said valve, said means being operated by the tension of the material being wound whereby as the tension increases the valve

is adjusted to decrease the pressure on the pump and thereby reduce the speed of the windup roll to decrease the tension of the material in order to maintain a constant tension.

- 5 2. In a machine for winding paper, textiles and the like, a frame, guide rolls carried by said frame, a floating tension roller positioned between said guide rolls, brackets carried by said frame, channels in said brackets to permit vertical
10 movement of said tension roll, a shaft for said tension roll operating in said channels, gears secured to the end of said shaft, a rack carried by said bracket and cooperating with said gears,
15 be rotated therewith, a windup roll, means for rotating said windup roll, means for controlling the speed of rotation of said windup roll, said control means operated by said lever carried by said floating tension roll shaft.
- 20 3. In a machine for winding paper, textiles and the like, a frame, guide rolls carried by said frame, a floating tension roller positioned between said guide rolls, brackets carried by said frame, channels in said brackets to permit vertical
25 movement of said tension roll, a shaft for said tension roll operating in said channels, gears secured to the end of said shafts, a rack carried by said bracket and cooperating with said gears, a lever connected to said shaft and adapted to
30 be rotated therewith, a windup roll, means for rotating said windup roll, an oil pump, an oil

reservoir, connections between said pump and said reservoir, driving means for said rotating means, said pump exerting a braking pressure on said driving means, means to vary the amount of pump pressure, said lever controlling said pump pressure varying means. 80

4. In a machine for winding paper, textiles and the like, a frame, guide rolls carried by said frame, a floating tension roller positioned between guide rolls, brackets carried by said frame, channels in said brackets to permit vertical
85 movement of said tension roll, a shaft for said tension roll operating in said channels, gears secured to the end of said shafts, a rack carried by said bracket and cooperating with said gears, a lever connected to said shaft and adapted to
90 be rotated therewith, a windup roll, means for rotating said windup roll, braking means to vary the speed of rotation of said windup roll, control means operated by said lever to vary the
95 braking pressure exerted by the braking means on said rotating means.

5. In a windup machine for paper, textiles and the like, a windup roll, means for rotating said roll, means for controlling the speed of rotation of said roll including a rotary pump and means for automatically decreasing the speed of rotation of said roll by increasing the retarding effect of said rotary pump simultaneously driven by said means for rotating said roll. 100

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