June 9, 1931. C. J. ROWE 1,809,147

REWINDING MECHANISM

Filed Aug. 10, 1926 3 Sheets-Sheet 1

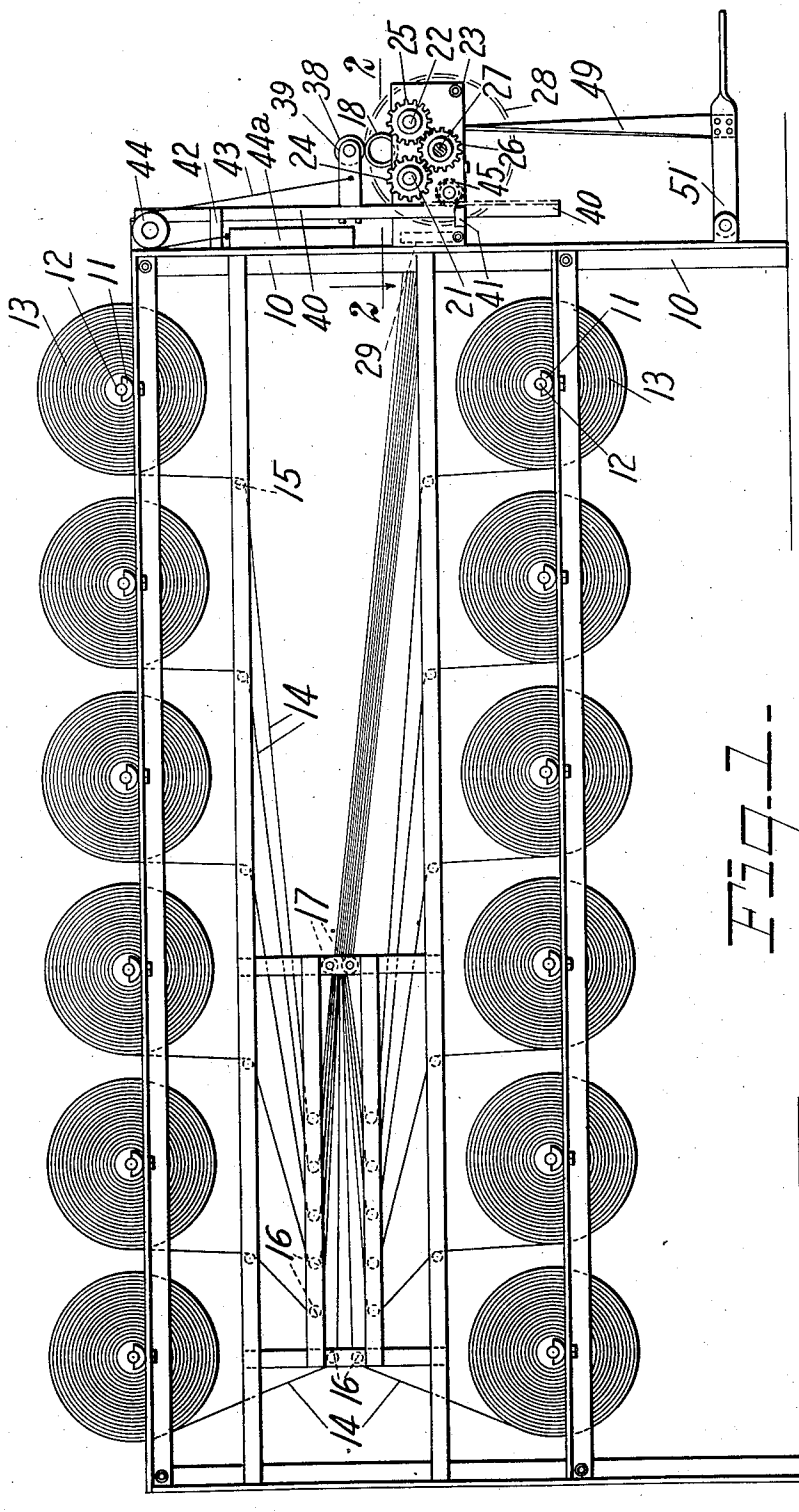


Fig. 1.

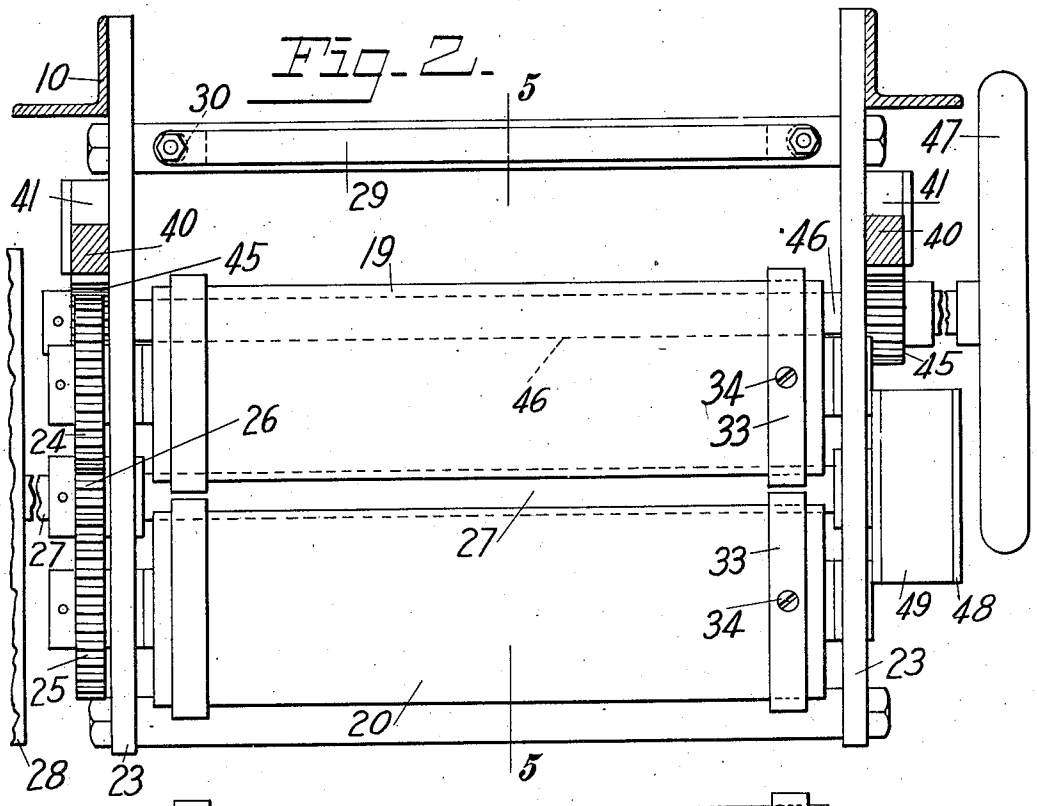
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Fig. 2.



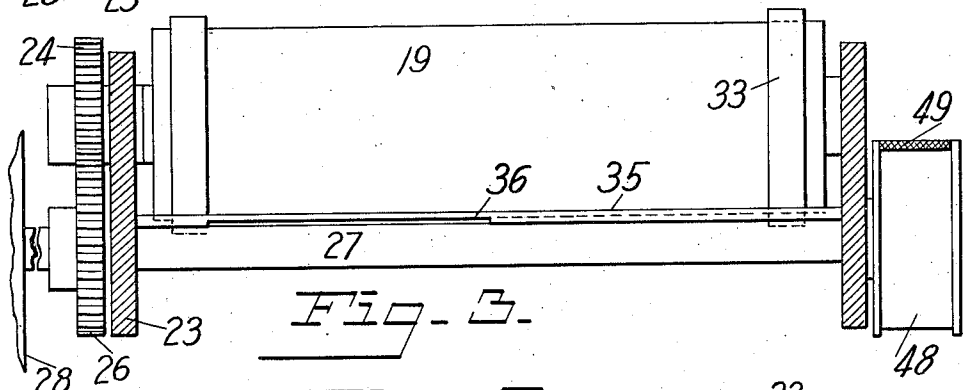
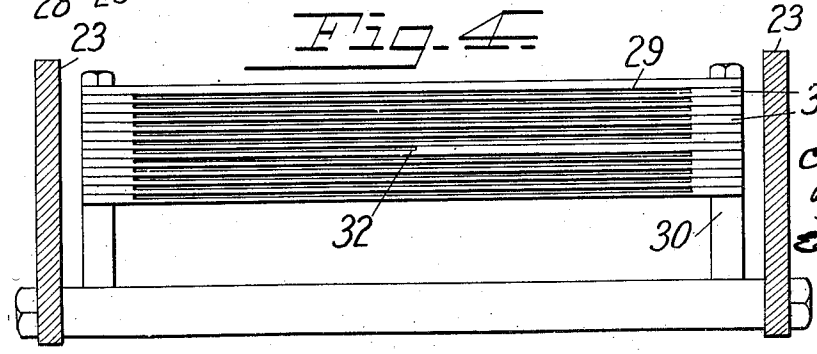


Fig. 3.

Fig. 4.



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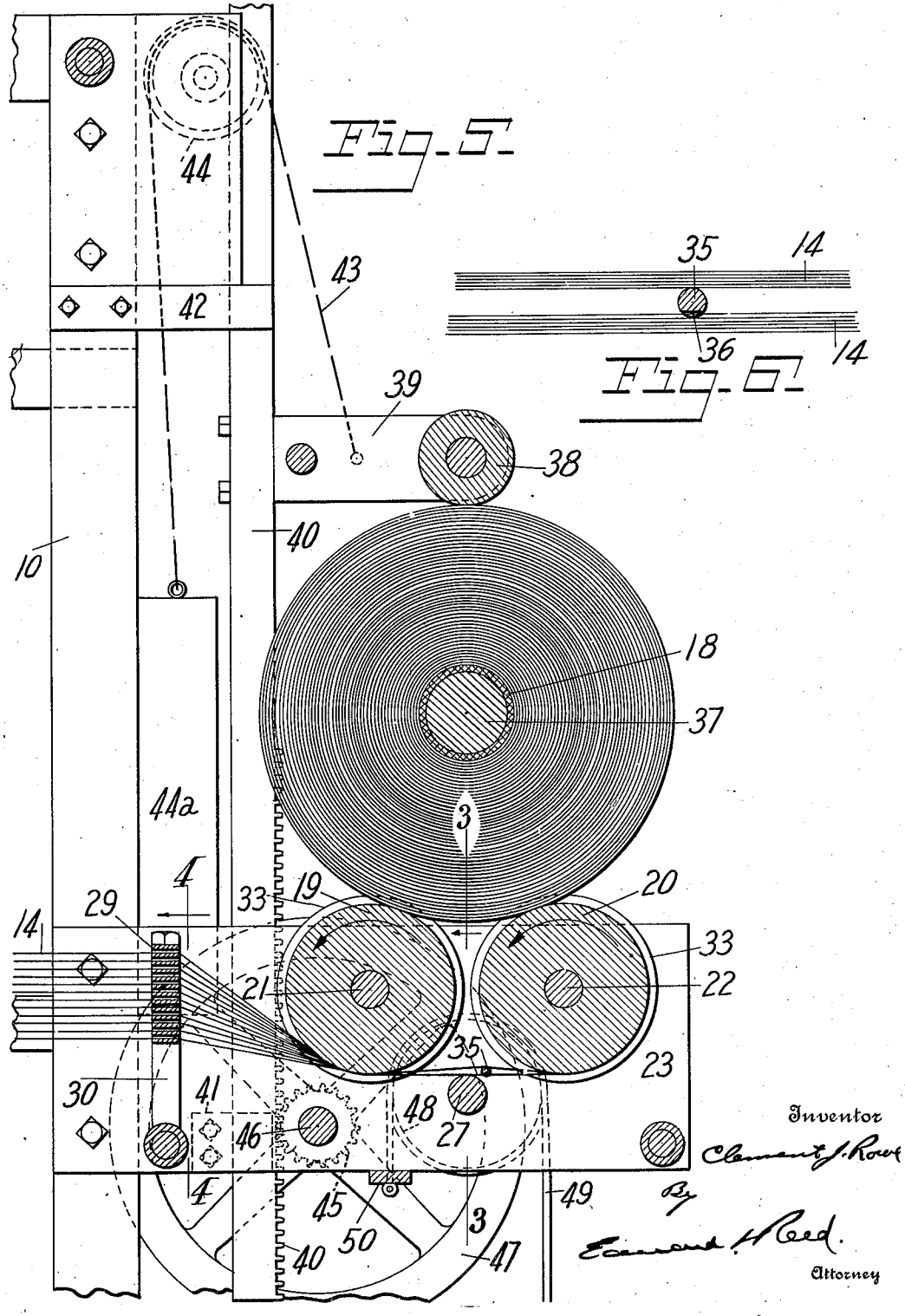


Fig. 6.

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UNITED STATES PATENT OFFICE

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REWINDING MECHANISM

Application filed August 10, 1926. Serial No. 128,483.

This invention relates to a rewinding mechanism and is designed more particularly for winding a plurality of webs of paper, or the like, in superimposed relation, into a single roll, which is commonly termed a unit roll.

One object of the invention is to provide such a mechanism which will be simple in its construction and operation and which will accurately wind the superimposed webs into the unit roll.

A further object of the invention is to provide such a mechanism with means for properly positioning the webs with relation one to the other and for maintaining the same in proper position in relation one to the other and in relation to the unit roll as they are wound onto the unit roll, thus maintaining the several webs in proper alinement in the unit roll.

A further object of the invention is to provide such a mechanism which will properly position webs of different widths with relation one to the other and to the unit roll.

Another object of the invention is to provide such a mechanism with improved means for rotating the unit roll and for maintaining the roll in proper contact with the driving means.

Other objects of the invention will appear as the mechanism is described in detail.

In the accompanying drawings Fig. 1 is a side elevation of a winding mechanism embodying my invention; Fig. 2 is a section taken on the line 2—2 of Fig. 1, showing the driving rolls in plan; Fig. 3 is a section taken on the line 3—3 of Fig. 5, looking in the direction of the arrows; Fig. 4 is a section taken on the line 4—4 of Fig. 5, looking in the direction of the arrows; Fig. 5 is a vertical sectional view taken through the forward end of the mechanism, on the line 5—5 of Fig. 2; and Fig. 6 is a sectional detail view of the guide rod for a narrow web.

In these drawings I have illustrated one embodiment of my invention and have shown the same as comprising a supporting structure or main frame 10 which is provided with means for individually supporting thereon a plurality of webs of paper or other similar material. These webs may be supplied in different forms but usually come either in rolls or in stacks of folds and the character of the supporting means for the webs will necessarily depend in part upon the form in which the webs are supplied. The present mechanism is designed for use with webs in roll form and is therefore provided with a plurality of pairs of bearings 11, each pair of bearings being adapted to receive and support the shaft 12 which carries the roll 13. The number of rolls employed will be determined by the number of webs which are to be wound into the unit roll. The present mechanism is capable of handling any number of webs up to twelve and therefore has twelve pairs of bearings 11. These bearings are preferably open bearings, or half bearings, so that the shafts 12 may be readily placed in or removed from the same.

The webs 14 of all the rolls, except the two at the left hand or rear end of the supporting structure, are first carried about guide rods 15, thence rearwardly and about other guide rods 16, thence forwardly between a pair of spaced guide rods 17 to the forward end of the machine. The webs from the two rolls at the rear end of the supporting frame are, in the present instance, carried directly to the guide rods 16 and thence forwardly with the other webs. In this manner the several webs are arranged in superimposed relation and in the proper order.

The forward ends of the superimposed webs are wrapped about or otherwise secured to a core 18 on which the unit roll is to be wound and means are provided for rotating this roll in a direction to draw the webs from the several individual rolls and to wind the same onto the unit roll. Preferably the unit roll is rotated by means of friction rollers contacting with the cylidrical surface thereof, thus causing the unit roll to be rotated at the same speed regardless of the gradually increasing diameter thereof. As here shown, two frictional driving rollers 19 and 20 are arranged with their axes in substantially the same horizontal plane and are spaced apart such a distance as to form a proper support for the unit roll. The frictional driving rolls 19 and 20 are rigidly secured respec-

tively to shafts 21 and 22 which are journaled in a supplemental frame 23 mounted on the main frame 10. The driving rolls may be actuated in any suitable manner but preferably they are provided at one end with gears 24 and 25 which mesh with a gear 26 mounted on a shaft 27 also journaled in the supplemental frame 23 and having at one end means for rotating the same, such as a belt pulley 28.

It is important that the several webs should be in proper alinement one with the other when they are wound on the unit roll, particularly when the webs are provided with printed forms for use in a manifolding machine. The present mechanism has means for first properly positioning the webs with relation one with the other and for maintaining them in that position as they are wound onto the unit roll and, as here shown, the several webs 14 are threaded through individual guideways 29 formed in a guide 30 which is rigidly mounted on the supplemental frame 23. This guide comprises a series of superimposed bars 31 each having in its upper surface a longitudinally extending recess of a width substantially equal to the width of the web and which constitute the guides 29. The bars 31 are mounted in fixed positions with relation one to the other and consequently the webs are brought into vertical alinement as they pass through the guide. It is sometimes desired to have one or more of the webs of a less width than the others and in such cases the recess in the corresponding guide bar 31 is made of a width substantially equal to the width of the narrow web, as shown at 32 in Fig. 4, and this recess is so arranged with relation to the recesses in the other guide bars as to properly position the narrow web with relation to the other webs. The superimposed webs, as they pass from the guide 30, are carried beneath the driving rollers 19 and 20, thence upwardly about the foremost roller 20 and about the core 18. The webs are given an initial wrap about the core sufficient to retain the same thereon and the roll which is thus started is placed upon the driving rollers which are so arranged as to retain the unit roll thereon and to rotate the same in a direction to draw the webs from the individual rolls and wind the same upon the unit roll, and in order to maintain the webs in their proper relative positions with relation one to the other and to the unit roll the driving rollers 19 and 20 have mounted thereon, near the ends thereof, collars 33, the collars on each roller being spaced apart a distance substantially equal to the width of the wider webs and being of a thickness or depth considerably greater than the combined thicknesses of the several webs. The collars are rigidly secured to the respective rollers, this being accomplished in the present instance by means of set screws 34 which will permit the collars to be adjusted to accommodate the same to webs of different widths. The unit roll when in position on the driving rollers will rest between the shoulders formed by the collars 33 and will be held against lateral displacement thereby. In this manner the webs are maintained in proper alinement both with relation one to the other and with relation to the unit roll and will thus be wound onto the unit roll in proper positions with relation one to the other. Where a narrow web is employed as above mentioned it may be found desirable to utilize an additional guide to maintain this narrow web in its proper position as it passes to the unit roll. In the present machine I have shown a small guide rod 35 arranged between the narrow web and an adjacent web, at a point below and between two driving rollers, and this guide rod has in its lower surface a recess 36 of a length corresponding to the width of the narrow web, thus making certain that the narrow web will be in proper position with relation to the other webs as it passes onto the forward driving roller, after which there is little chance of its being displaced.

In order to impart to the unit roll sufficient weight to secure the proper frictional contact with the driving rollers, particularly during the early stages of the winding operation, I have inserted in the tubular core 18 of the unit roll a round bar of metal 37 which is of such a character that it can be readily removed when the roll has been completed. Mounted above the unit roll and arranged to rest upon the uppermost portion thereof is a roller 38 which serves to retain the unit roll in proper position with relation to the driving rollers and also to press the same into contact with the driving rollers. This roller 38 is vertically adjustable and is so mounted that it will automatically accommodate itself to the increased diameter of the unit roll as the rewinding progresses. As here shown, the roller is supported at the forward ends of the two arms 39 which are rigidly secured at their rear ends to rack bars 40 slidably mounted in guides 41 and 42 carried respectively by the supplemental frame 23 and the main frame 10. Cables 43 extend about pulleys 44 mounted near the top of the main frame 10 near the respective sides thereof and each of these cables is connected at one end with a corresponding arm 39 and at its other end with a weight 44*a*. These weights serve to partially counterbalance the weight of the roller 38 and its associated parts but permit this roller to rest upon the unit roll and to exert some pressure thereon. The rack bars 40 mesh with pinions 45 carried by a shaft 46 mounted in the supplemental frame and provided at one end with an actuating device, such as a hand wheel 47, by means of which the roller 38 may be elevated to permit the

removal of the completed roll and then lowered into contact with the new unit roll.

Rigidly secured to the shaft 27 is a brake drum 48. A friction band or strap 49 extends about this drum and is rigidly secured at one end to a fixed part of the supplemental frame 23, as shown at 50, and has its other end extending downwardly and connected with a foot lever 51 by means of which it may be drawn into frictional contact with the drum, thus providing means for quickly checking the movement of the rewinding mechanism when the connection between the same and the source of power has been interrupted, as when the current to an electric motor has been turned off.

While I have shown and described one embodiment of my invention, I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a mechanism for rewinding a plurality of flexible webs in superimposed relation on a unit roll and including a roller having supporting engagement with the unit roll and about which the webs are led to said unit roll, a guide unit arranged in advance of and adjacent to said roller and comprising a plurality of superimposed bars rigidly secured one to the other and each having in one face thereof a longitudinal recess to receive one of said webs, the several recesses being arranged to properly position said webs with relation one to the other as they pass into engagement with said roller.

2. In a mechanism for rewinding a plurality of flexible webs in superimposed relation on a unit roll and including driving rollers to support and rotate the unit roll and about which said webs are led to said unit roll, a guide mounted in advance of said driving rollers and comprising individual guideways for the respective webs, one of said guideways being of less width than the other guideways to receive a narrow web and all the guideways being arranged to properly position the several webs with relation one to the other, and a guide bar interposed between said narrow web and an adjacent web and having a recess to receive said narrow web and maintain the same in proper position with relation to the other webs.

3. In a mechanism for rewinding a plurality of flexible webs in superimposed relation on a unit roll and including frictional driving rollers to support and rotate said unit roll and about which said webs are led to said unit roll, a guide arranged in advance of said driving rollers and having individual guideways for the respective webs, said guideways being arranged to properly position said webs with relation one to the other, and a guide bar arranged between said driving rollers and extending between adjacent webs of different widths and having a recess to receive the web of less width and maintain the same in proper position with relation to the other webs.

4. In a mechanism for rewinding a plurality of flexible webs in superimposed relation on a unit roll and including a roller having supporting engagement with said unit roll and about which said webs are led to said unit roll, a guide arranged in advance of said roller and having individual guideways for the respective webs arranged to properly position said webs with relation one to the other as they pass into engagement with said roller, and a guide bar arranged between adjacent webs of different widths and having a recess to receive a web of less width and maintain the same in proper position with relation to the other webs.

In testimony whereof, I affix my signature hereto.

CLEMENT J. ROWE.