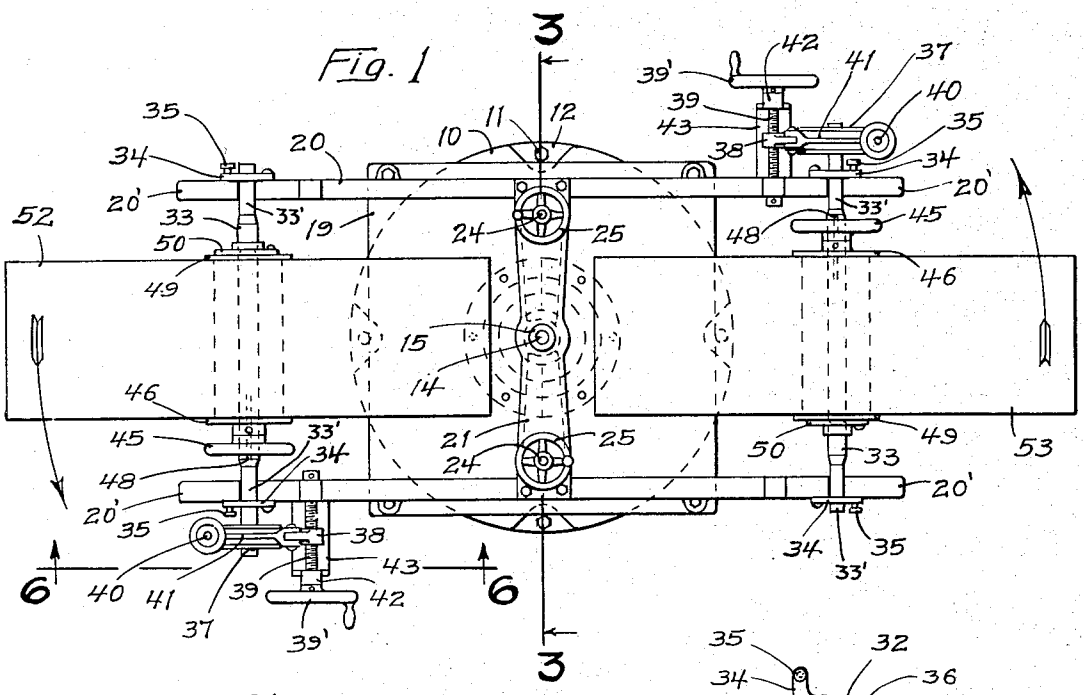
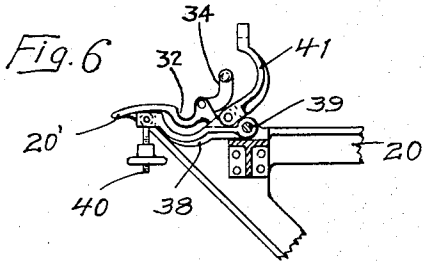
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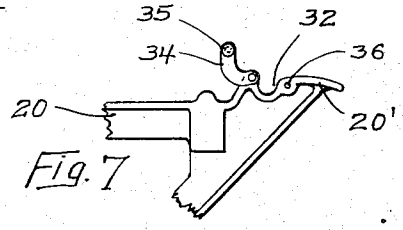
RAPID CHANGE REEL FOR PAPER FABRICATING MACHINES

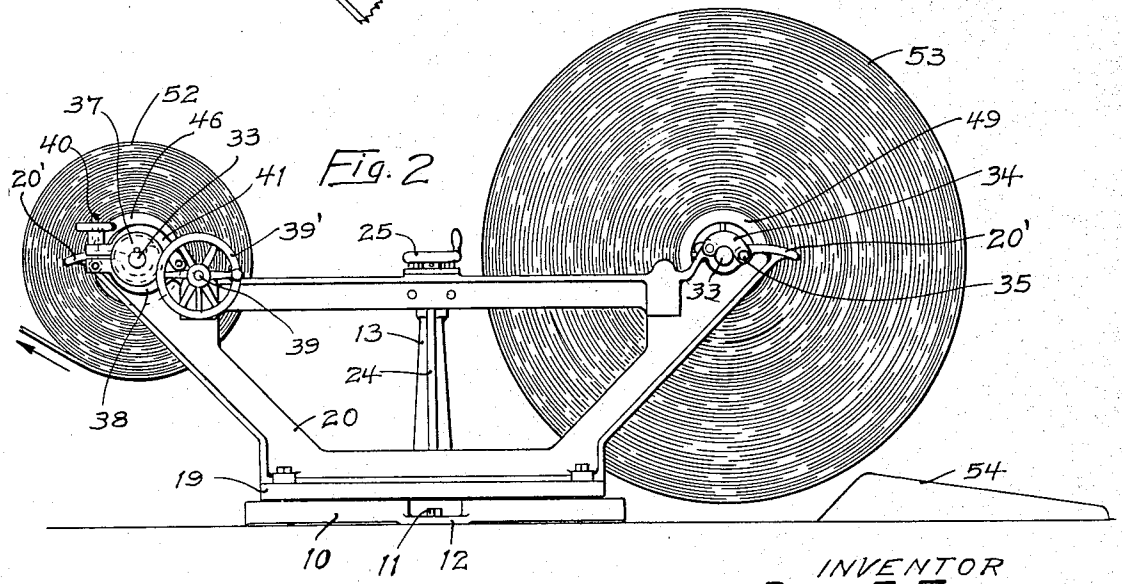
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Fig. 1









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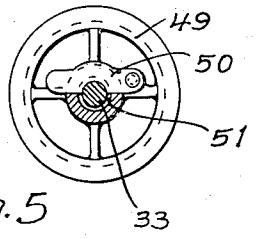


Fig. 5

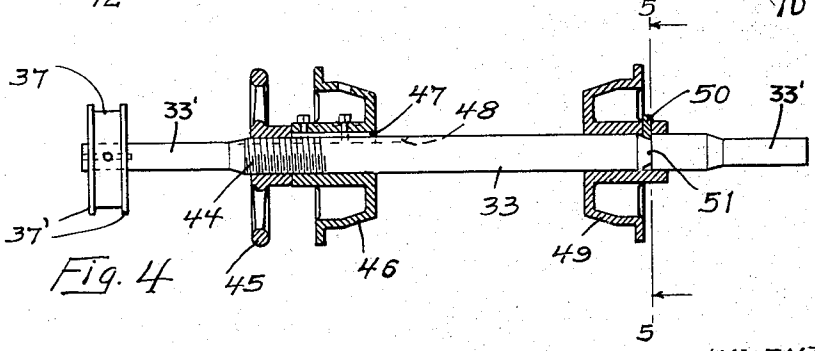


Fig. 4

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RAPID CHANGE REEL FOR PAPER FABRICATING MACHINES

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Application November 10, 1939, Serial No. 303,831

4 Claims. (Cl. 242—64)

My invention relates to means for supporting a roll of paper stock in feeding position directly in front of a machine for producing paper goods from a web, such as envelopes, cartons, egg case fillers and trays, various kinds of containers, laminated and corrugated boxboard, etc., and as modern production machines of this type run at high speed, it is very important that the rolls of paper stock for same may be easily and quickly mounted in perfect alignment with the feed mechanism of the machine and arranged to unwind easily and steadily as the machine draws the paper from the roll.

As it is common practice in the paper goods industry to use paper stock in rolls as large as five feet in diameter and weighing about 600 pounds each, it is a considerable task to replace the exhausted rolls at frequent intervals, and as the machine must be at a stand-idle during such intervals, it is very important to replace such rolls in the shortest possible period of time.

It is therefore an object of my invention to provide an improved means for rapidly replacing such rolls of paper stock with the least possible effort on the part of the operator, so as to promote efficient and economical operation of the fabricating machine.

A further object of my invention is to provide a rapid-change reel device whereon the operator may mount and prepare a second roll on an auxiliary arbor during the period while the first roll is being fed through the machine and while the operator is not otherwise employed, so that the prepared roll may be simply swung into feeding position and connected with the feeding mechanism of the machine in considerably less time than would otherwise be required.

My invention consists in providing identical roll supporting arbors at opposite ends of a supporting frame mounted for rotary adjustment, so that while one roll is being fed to the machine from an arbor at one end of the frame, a second roll may be adjusted on the other arbor and mounted on the frame at the other end thereof, and as the frame is mounted on anti-friction bearings, it is adapted to be easily and quickly rotated in a horizontal plane to a point where the second roll will replace the exhausted roll, and the frame may then be locked in such adjusted position while a third roll is prepared for the next change.

Other objects of the invention will appear from the following description and accompanying drawings and will be pointed out in the annexed claims.

In the accompanying drawings there has been disclosed a structure designed to carry out the various objects of the invention, but it is to be understood that the invention is not confined to the exact features shown as various changes may be made within the scope of the claims which follow.

In the drawings:

Figure 1 is a plan view of my improved machine, showing two rolls of paper stock mounted thereon in their respective places;

Figure 2 is a side view of Figure 1, showing one roll partly unwound as the paper stock is being fed to a fabricating machine;

Figure 3 is a vertical sectional view on the line 3—3 of Figure 1, showing the means for locking the supporting frame in operative position;

Figure 4 is a detail sectional view of one of the roll supporting arbors, showing the parts thereon in cross-section;

Figure 5 is a cross-sectional view on the line 5—5 of Figure 4;

Figure 6 is a detail sectional view on the line 6—6 of Figure 1, showing one of the arbor-supporting devices provided at each end of the supporting frame, and showing the parts thereof in released position and the arbor removed therefrom; and

Figure 7 is a similar view showing the means for supporting the opposite end of the arbor.

In the drawings, numeral 10 indicates a circular base casting which may be secured to the floor by bolts 11 passing through holes in recessed flanges 12 at four points on the periphery thereof. A vertical standard 13 is bolted to the center of this base and is provided with an extension 14 having an adjustable collar 15 at its upper end. A bearing ring 16 encircles the lower end of the standard 13 and is provided with a circular groove for receiving suitable bearing elements or balls 17, which support a bearing ring 18 on which a horizontal plate 19 is mounted. The plate 19, as here shown, is square in outline, and has arranged thereon a pair of side frame members 20 which are shown bolted to opposite side edges thereof. The upright frame members 20 are connected together at their upper ends by a cross-member 21, which has a central bearing 22 wherein the extension 14 is journaled. The plate 19, side frame members 20, and cross member 21 cooperate to provide a supporting frame for the paper rolls, as will subsequently be described.

The cross member 21 has bearings 23 adjacent

its ends which rotatably support the upper ends of a pair of shafts 24. Hand wheels 25 are secured to the upper ends of the shafts 24, and collars 26, secured to the shafts beneath the bearings 23, prevent upward movement of the shafts. Plugs 27 have threaded connections with the lower ends of the shafts 24, and these plugs have tapered lower ends adapted to enter a similarly tapered hole provided in a hardened bushing 28, inserted in the base 10 directly beneath one of the shafts 24, when the supporting frame is in one of its adjusted positions, as shown, for example, in Figure 3. Said plugs have vertical grooves 29 adapted to receive the shaped ends of screws 30 which prevent the plugs from relatively rotating in their fixed sleeves 31, through the walls of which said screws extend into said grooves.

When the hand wheel 25, positioned over the bushing 28, is turned in one direction, said shaft 24 will force the tapered end of its plug 27 into the tapered hole in the bushing 28, whereby the supporting frame is locked in adjusted position on the base 10. When the hand wheel is rotated in the opposite direction, its complemental plug 27 is withdrawn from the bushing 31, whereby the supporting frame may be freely rotated upon its base 10 to present a fresh roll of paper to the fabricating machine.

The opposite ends of the side frame members 20 extend outwardly beyond the plate 19 and terminate in curved projections 20', each having a smooth top surface. Open bearings 32 are provided in the upper faces of the projection 20', and are spaced inwardly from the terminals thereof, as best shown in Figures 1 and 2. The bearings 32 are adapted to receive the arbor shafts 33, as shown in Figures 1 and 2.

Suitable latch arms 34 are hinged at one end to the frame members 20 adjacent to the open bearings 32. The opposite ends of these latch arms are provided with thumb screws 35 adapted to enter threaded holes 36 in the projections 20', thereby to lock said arms in place with their curved intermediate portions extending over the arbor shafts 33, to keep said shafts in their respective bearings 32, as shown in Figure 2. In operation, I have found that the weight of the arbors 33 with the paper rolls mounted thereon, will keep the arbors in the bearings 32, and the latch arms 34 may therefore, be dispensed with in some instances, if desired. The arbor shafts 33 are shown provided with reduced end portions 33', of sufficient length to allow said shafts to slide endwise in the bearings 32.

A brake drum 37 is secured at one end of each shaft 33 in position to be engaged by a brake shoe 38 which has a threaded hub at one end mounted on a short threaded shaft 39. The opposite end of each brake shoe 38 is provided with an eye-bolt 40, having a hand wheel or nut 40' received in threaded engagement therewith. Another brake shoe 41 is hinged to the brake shoe 38 at one end, while its other end is slotted to receive the eye-bolt 40, and whereby the brake shoes may be lightly clamped on the brake drums 37 to apply frictional resistance against rotation of the arbor shafts. The threaded shafts 39 have their inner ends journaled in bosses provided on the frame members 20. The outer ends of these shafts are journaled in bearings 42 provided in suitable brackets 43, shown bolted to diagonally opposite ends of the side frame members 20. Hand wheels 39' are secured to the outer ends of the shafts 39 whereby said shafts may be rotated to axially translate the brake shoes thereon. Such axial movement of either pair of brake shoes 38 and 41, when engaged with their respective brake drum 37, as shown in Figures 1 and 2, will cause the arbor shaft of said brake drum to be longitudinally moved in the bearings 32, as a result of the brake shoes engaging the flanges 37' of the drum.

Each arbor shaft is provided with a screw threaded portion 44 on which the threaded hub of a hand wheel 45 is disposed with its hub in contact with the hub of a flanged cone 46 in which a key 47 is secured, which is slidably received in a key-way 48 in said shaft, thereby to keep said cone from turning thereon. Another flanged cone 49 is loosely arranged on the shaft 33 and is held in a predetermined position thereon by a dog 50 which is pivoted at one end to the cone 49, in position to enter a transverse slot in the hub of said cone and an annular groove 51 in the arbor. A roll of paper stock 52 may be held firmly in place on the arbor shafts between the flanges of the cones 46 and 49 at each end of the rotatably mounted supporting frame, as shown in Figures 1 and 2.

In the operation of the novel apparatus hereinin disclosed, a roll of paper 52 is mounted on an arbor at one end of the machine, and the end of the paper web is then fed into the paper feeding mechanism of the fabricating machine (not shown), as indicated by the arrow at the left hand side of Figure 2. After the fabricating machine has been started, an operator or attendant may mount another roll 53 upon the opposite end of the supporting frame, as shown in Figure 2. When the roll of paper 52 has been fed into the fabricating machine or is exhausted, the operator rotates the hand wheel 25 in a direction to unlock the supporting frame from the base 10, and the supporting frame is then rotated a half revolution to bring the fresh roll of paper 53 into position adjacent to the fabricating machine, as will readily be understood by reference to Figures 1 and 2. The end of the fresh roll of paper is then fed into the feeding mechanism of the fabricating machine, as previously stated, after which the fabricating machine is again started.

As the fresh roll of paper is being unwound by the fabricating machine, the operator inserts an empty arbor, shown in Figure 4, through the core of a fresh roll of paper. This is readily accomplished by removing the cone 49 from the empty arbor, and inserting the arbor through the usual opening provided in the core of the roll of paper, after which the cone 49 is secured to the arbor and the roll securely clamped in position on the arbor by manipulation of the hand wheel 45.

The fresh roll of paper with an arbor mounted therein, is then rolled up an inclined block 54, which is arranged in front of the supporting frame and is of such height that the ends of the arbor shaft will pass over the terminals of the end portions 20' of the side frame members of the supporting frame. Further forward movement of the roll will cause the bearing portions 33' of the arbor to enter the open bearings 33 of the supporting frame, after which the arbor may be secured in position therein by manipulation of the latch arms 34.

It is essential that the roll of paper be accurately alined with the paper receiving end of the fabricating machine. This is readily accomplished by manipulation of the hand wheels 39',

whereby the arbor may be axially moved in the frame to laterally adjust the fresh roll of paper with respect to the receiving end of the fabricating machine.

By the use of this novel structure, the operation of supplying a fresh roll of paper to the fabricating machine is greatly expedited, which results in greater economy and output of the fabricating machine. If desired, three arbors **3** may be provided, whereby the operator or attendant will always have plenty of time to secure an empty arbor in position in a fresh roll of paper to have said roll ready for immediate mounting in the supporting frame, when the roll being unwound by the fabricating machine is used up.

By reference to Figure 1, it will be noted that the arbors mounted in the machine are provided with independent means for longitudinally adjusting them, and also with means for frictionally controlling the rotation of the rolls. In like manner, duplicate locking means are provided on the supporting frame for locking the supporting frame in adjusted position upon the base **10**, whereby an operator may readily and conveniently manipulate the machine in the operation of rotating it from one position to another, as indicated by the arrows in Figure 1, by standing at one side thereof.

In the drawings, I have shown the supporting frame mounted on spherical bearing elements **17**, but it is to be understood that other forms of bearings, applicable for the purpose, may be utilized without departing from the scope of the invention. It is also to be understood, that while I have shown but one locking bushing **28** in the base **10**, two such bushings may be used, one on each side of the base, whereby the operator or attendant may be stationed at either side of the machine.

I claim as my invention:

1. In an apparatus for supporting a roll of paper stock in feeding position adjacent to a machine to be supplied, a stationary base having a socket therein, a frame mounted for rotary adjustment on said base, arbors detachably mounted on said frame, one at each end thereof, means for securing a roll of paper stock on each arbor, when the arbors are detached from the frame, a shaft rotatably mounted in said frame, and a plug received in threaded engagement with said shaft and adapted to be axially moved into the socket in said base, when the shaft is rotated in one direction, thereby to lock the frame to the base with one of said arbors in feeding relation to the machine.

2. In an apparatus for supporting a roll of paper stock in feeding position adjacent to a machine to be supplied, a stationary base, a supporting frame mounted for rotary adjustment on said base, arbors loosely supported at the opposite ends of said frame and adapted to be quickly removed therefrom, means for securing each arbor in the core of a roll of paper stock before mounting the arbor on said frame, means for locking the frame with either of said arbors in feeding position adjacent to said machine, and means for transversely adjusting said arbors in said frame to aline the roll of paper stock with the machine.

3. In an apparatus for supporting a roll of paper stock in feeding position adjacent to a machine to be supplied, a base, a supporting frame mounted for rotary adjustment on said base, arbors rotatably supported at the opposite ends of said frame and adapted to be quickly removed therefrom, means for securing each arbor in the core of a roll of paper stock before mounting the arbor on said frame, means for locking the frame with either of said arbors in feeding position adjacent to said machine, means for transversely adjusting the arbors in said frame, and friction means for preventing overrunning of the arbors.

4. In an apparatus for supporting a roll of paper stock in feeding position adjacent to a machine to be supplied, a suitable base, having a socket therein, a supporting frame rotatable on said base, arbors rotatably supported at the opposite ends of said frame and adapted to be quickly removed therefrom, each of said arbors being adapted to have a roll of paper stock mounted thereon, means for locking the frame with either of said arbors in feeding relation to said machine, means for transversely adjusting said arbors in said frame to aline the roll of paper stock with the feeding means of the machine, and duplicate locking elements carried on said frame and having independent means for moving them into locking engagement with the socket in said base, and whereby the frame may be locked to the base with either of said arbors in feeding relation to the machine.

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