Aug. 17, 1965 D. F. CUNNINGHAM ETAL 3,200,910

BRAKE MECHANISM FOR INTERMITTENT FEEDING CONSTRUCTION

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Fig. 1.

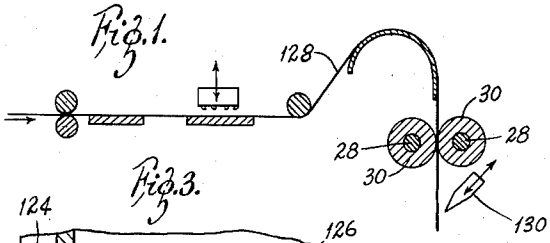


Fig. 3.

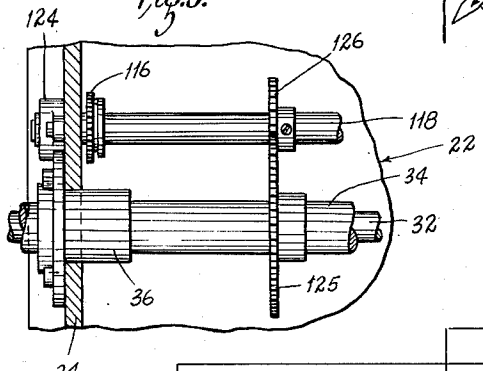
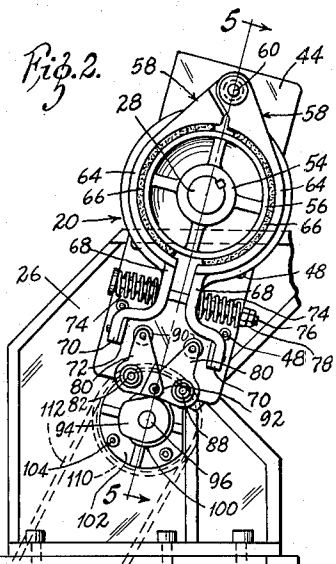


Fig. 2.



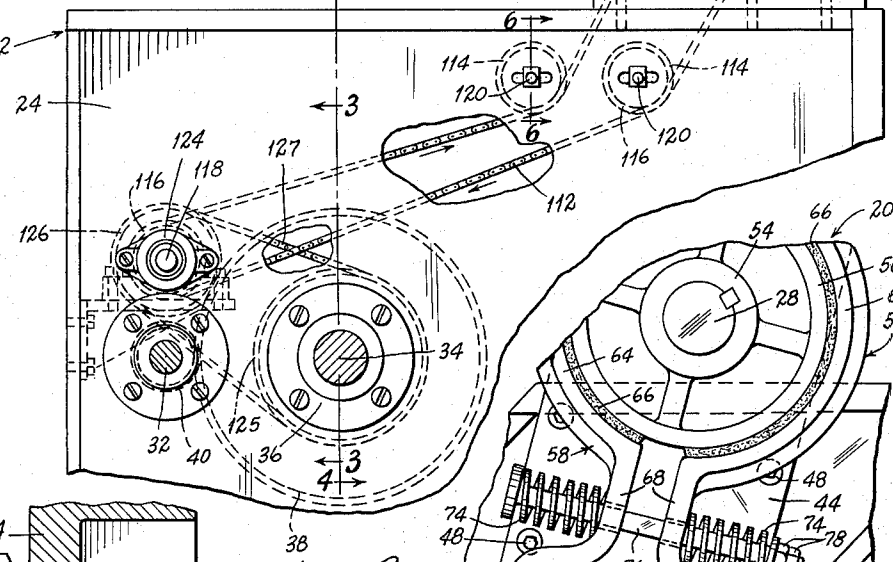


Fig. 6.

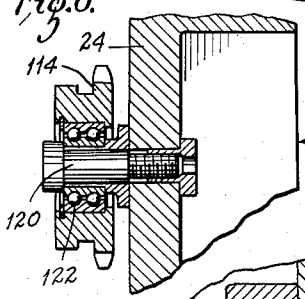


Fig. 7.

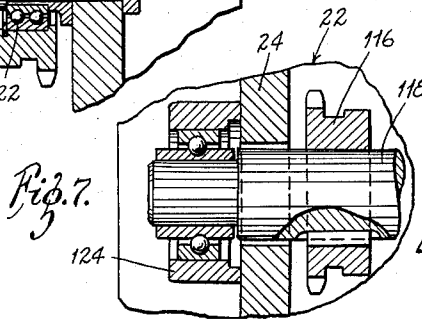


Fig. 8.

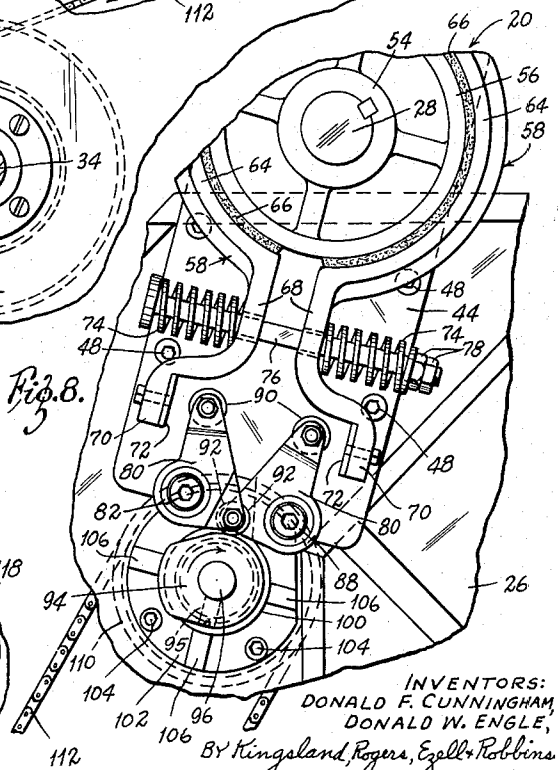


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Fig. 4.

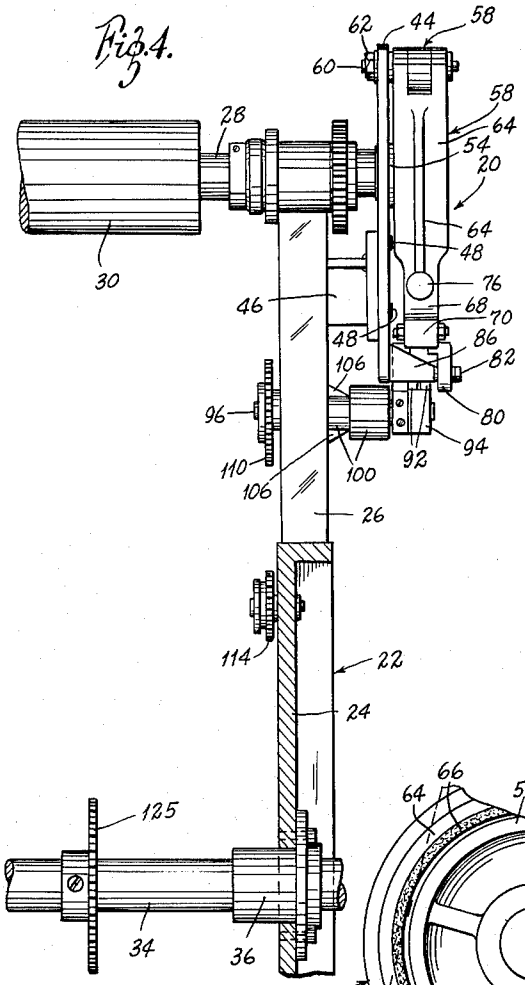


Fig. 5.

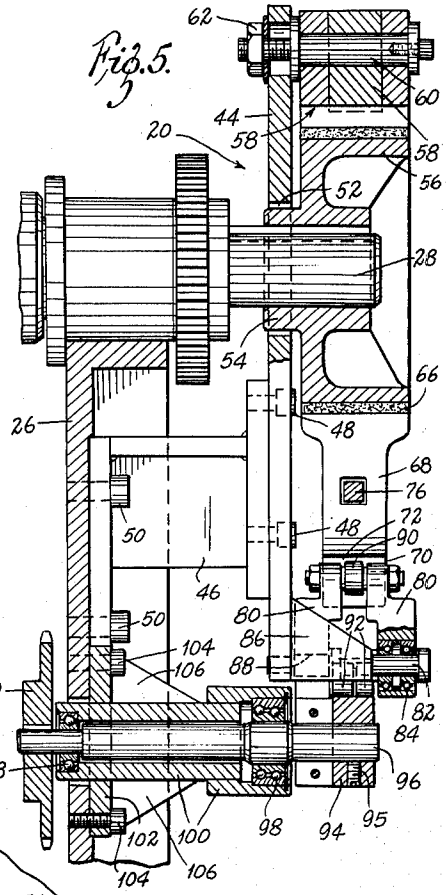
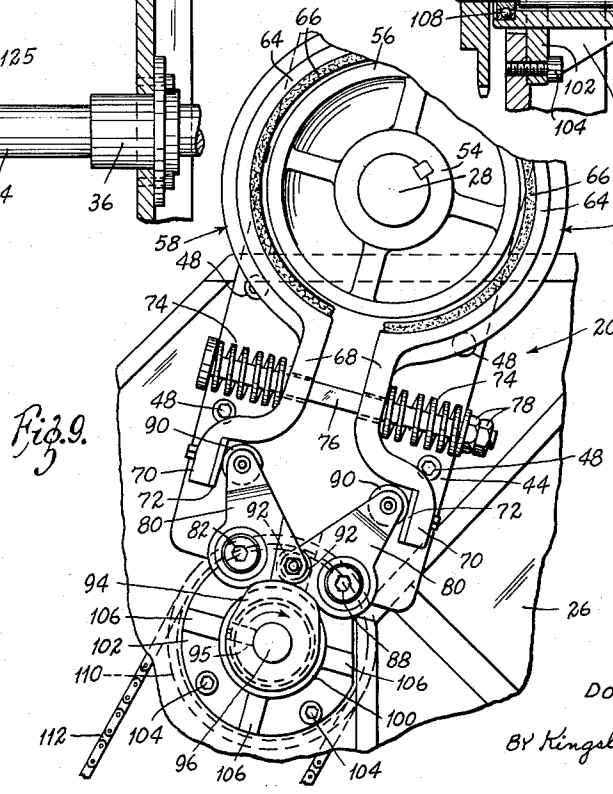


Fig. 9.



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3,200,910

BRAKE MECHANISM FOR INTERMITTENT FEEDING CONSTRUCTION

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1 Claim. (Cl. 188—85)

The present invention relates generally to the brake art, and more particularly to a novel brake mechanism for intermittent feeding constructions as the rotary feeder of a partition assembling machine.

For many years, partition fabricating machines like that shown in the Vail et al. Patent No. 2,163,923, and others, have been used in the making of partition assemblies. These machines include feeding rollers for moving a continuous strip of paperboard into position for severance by a knife. The movement of the feeding rollers is intermittent, requiring timed braking action to prevent overrun or backup of the paperboard. In the mentioned Vail et al. patent, a brake device is disclosed, but neither this brake nor others have been entirely satisfactory in stopping and holding the paperboard as required. It will be understood that overrun of the continuous paperboard will cause jamming in later feeding action, and that backup will result in severance of a partition strip of insufficient depth or height in the next fed segment of paperboard.

Therefore, an object of the present invention is to provide a novel brake mechanism for intermittent feeding construction which effectively solves the above long existing problem in partition fabricating machine.

In brief, the present novel brake mechanism for intermittent feeding construction includes pivoted lined brake shoes mounted for engagement with and release from a shaft which is intermittently driven in one direction of rotation. Separate positive action means are provided for effecting successively and cyclically clamping of the brake shoes upon the shaft and release therefrom, these actions being so timed in respect to the intermittent movement of the shaft to insure immediate, accurate stopping and release of the shaft.

Hence, another object is to provide a novel brake mechanism for intermittent feeding construction which is positive and accurate in stopping, holding and releasing an intermittently driven shaft during the period it is required to be inoperative.

Another object is to provide brake mechanism for intermittent feeding construction which is of rugged construction, thereby requiring minimum maintenance, which effects savings in maintenance manpower and the substantial elimination of down-time chargeable to the brake mechanism.

Another object is to provide novel brake mechanism for intermittent feeding construction which requires substantially no inspection and in which the brake lining as it begins to wear can be removed at some time when the partition fabricating machine is down for some other purpose.

The foregoing and other objects and advantage are apparent from the following description taken with the accompanying drawings, in which:

FIGURE 1 is a schematic view illustrating a continuous or endless paperboard sheet being drawn across the top of a partition fabricating machine by feeding rollers;

FIGURE 2 is a side elevational view of a novel brake mechanism for intermittent feeding construction operatively mounted upon a partition fabricating machine of which only fragments are disclosed;

FIGURE 3 is a fragmentary vertical, transverse view taken on substantially the line 3—3 of FIGURE 2;

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FIGURE 4 is a fragmentary vertical, transverse cross-sectional view taken on substantially the offset line 4—4 of FIGURE 2;

FIGURE 5 is an enlarged transverse, cross-sectional view taken on substantially the line 5—5 of FIGURE 2;

FIGURE 6 is an enlarged vertical, transverse, cross-sectional view taken on substantially the line 6—6 of FIGURE 2;

FIGURE 7 is an enlarged fragmentary transverse, vertical cross-sectional view taken diametrically through the bearing and sprocket from which power is transferred to a rotatable cam forming part of the brake mechansim;

FIGURE 8 is an enlarged fragment of FIGURE 2, illustrating in greater detail the brake cam and actuating levers; and

FIGURE 9 is a view similar to FIGURE 8, but with the brake cam in position maintaining the brake shoes in clamping relation on the shaft.

Referring to the drawings more particularly by reference numerals, 20 indicates generally a brake mechanism for intermittent feeding construction which incorporates the principles of the present invention. The brake mechanism 20 is illustrated as operatively mounted upon a partition fabrication or assembling machine 22, only essential portions of which are shown. The machine 22 includes a side frame 24, a flanged superstructure plate 26, rotatable shafts 28 of feed rolls 30, a constant speed continuously driven power shaft 32 (FIGS. 2 and 3), a power distributing shaft 34 together with one supporting bearing 36 thereof secured by cap screws to the frame 24, and a large gear 38 mounted on and secured to said shaft 34 for movement therewith. The large gear 38 is disposed adjacent the end of the shaft 34 that is remote from the frame 24, the large gear 38 being in driven mesh with a small gear 40 secured to the power shaft 32.

The brake mechanism 20 includes a rectangular mounting plate 44 which is secured to a pillow block mounting bracket 46 by means of cap screws 48, or the like, as is clearly shown in FIGURE 5, the pillow block mounting bracket 46 being secured to the plate 26 by cap screws 50. The mounting plate 44 includes a circular opening 52 which is concentric with the feed shaft 28. Concentric within the opening 52 is the hub 54 of a brake drum 56 keyed to the end of the shaft 28.

Two brake shoes 58 are pivotally mounted on a stub shaft 60 which is secured by a nut 62 and suitable spacers and washers to the upper end of the mounting plate 44 (FIG. 5). Each brake shoe 58 is of the configuration clearly shown in the drawings, each including an arcuate portion 64 receiving a segment of brake lining 66, a necked-in portion 68, and a foot portion 70 receiving a removable brake shoe wear pad 72. The brake shoes 58 are disposed with the linings 66 in position for engagement with and release from the brake drum 56, as the drawings clearly disclose.

For closing the brake shoes 58 quickly and firmly against the brake drum 56, opposed strong compression springs 74 are mounted against the exterior faces of the necked-in portions 68 by means of an elongated bolt 76 and nuts 78. The springs 74 constantly bias the brake shoes 58 towards engagement with the brake drum 56.

For releasing the brake drum 56 and therethrough the feed shaft 28 against the pressure of the springs 74, two brake actuating levers 80 are provided each being of the configuration clearly shown in the drawings, particularly FIGURES 5, 8 and 9. The outer lever 80 is pivotally mounted upon a stub shaft 82 through a roller bearing 84, the stub shaft 82 being threadedly mounted on the end of a bracket 86 which is secured to the mounting plate 44. The inner lever 80 is pivotally mounted on a stub shaft 88 through a suitable bearing like bearing 84, the stub shaft 88 being threadedly engaged directly with the plate

44 (FIG. 5). As is clear, the levers 80 are generally triangular in outline, each including a roller 90 at one free corner for engagement with the wear plates 72 and a roller 92 at the other free corner, said rollers 92 being disposed for simultaneous engagement by a brake cam 94 mounted upon and adjustably secured to one end of a driven shaft 96 by a setscrew 95. It is clear from FIGURES 8 and 9 that the levers 80 maintain the brake shoes 58 in the released position when the rollers 92 are engaged by the high portion of the cam 94 (FIG. 9), and that the spring 74 firmly forces the brake shoes 58 into holding engagement with the brake drum 56 when the rollers 92 are in engagement with the low part of the cam 94 (FIG. 8). The ascent of the rollers 92 from the low part to the high part of the cam 94 is sharp, as is the descent from the high part to the low part of the cam 94, which provides quick brake drum 56 release and engagement, respectively.

The shaft 96 is of the configuration clearly shown in FIGURE 5 and is supported inwardly of the cam 94 by a ball-bearing unit 98 press-fitted or otherwise secured in the end of a composite housing 100 through which the shaft 96 extends, the housing 100 including a mounting flange 102 which is secured to the upright superstructure plate 26 by cap screws 104. The housing 100 also includes reinforcing webs 106. A second ball-bearing unit 108 is press-fitted or otherwise secured in the mounting end of the housing 100 for support of the shaft 96. A sprocket 110 is keyed to the end of the shaft 96 adjacent the bearing 103.

A chain 112 passes around the sprocket 110, under a first idler sprocket 114, around sprocket 116 keyed to a driven shaft 118, and under a second idler sprocket 114. The sprockets 114 are mounted from the side frame 24 on stub shafts 120 by means of suitable bearings 122 (FIG. 6). The shaft 118 is mounted in bearings 124 (FIG. 7).

Spaced inwardly from the side frame 24 and affixed to the shaft 34 is a sprocket 125. Affixed to the shaft 118 is a sprocket 126. A chain 127 is trained over the two sprockets 125 and 126.

It is clear that the brake cam 94 is continuously driven from the power shaft 32 through the elements detailed above. It is to be understood that the rotation of the brake cam 94 is timed so that the brake shoes 58 clamp the drum 56 immediately upon cessation of the positive forward feeding movement of the continuous paperboard 128 to prevent further forward movement or back-up movement (FIG. 1). This occurs as the paperboard 128 reaches the position of FIGURE 1, the knife 130 thereupon being actuated to sever the free bottom portion which has moved into interfitting relation with aligned longitudinally disposed precut partition strips as is detailed in the Vail et al. Patent No. 2,163,923. The drum 56 is released as positive feeding resumes. Timing and adjustment of the cam 94 in respect to the feed rolls 30 is obtained through the setscrew 95.

It is apparent that there has been provided novel brake mechanism which fulfills the objects and advantages sought therefor.

It is to be understood that the foregoing description and the accompanying drawings have been given by way of illustration and example. It is also to be understood that changes in form of the elements, rearrangement of parts, and subtsitution of equivalent elements, which will be obvious to those skilled in the art, are contemplated as within the scope of the present invention which is limited only by the claim which follows.

What is claimed is:

In combination, brake mechanism for stopping, holding and releasing a rotatable member comprising a pair of freely pivoted brake shoe members for engaging a rotatable member, strong springs engaging said brake shoe members biasing them into engagement with a rotatable member, a pair of brake levers freely pivotally mounted for engaging said brake shoe members, a roller freely pivotally mounted on each brake lever, a cam rotatably mounted for cyclical engagement by said rollers of said brake levers to move said brake levers into engagement with said brake shoe members to release them from a rotatable member, said cam including a first peripheral portion of predetermined constant radius, a second peripheral portion of a predetermined constant radius greater than said first peripheral portion, and sharp transistional peripheral portions between said first and second peripheral portions, said first peripheral portion permitting said brake shoe members to engage rotatable member in braked relation for a predetermined time period, said second peripheral portion holding said brake shoe members in released relation with a rotatable member for a predetermined time period, said sharp transitional peripheral portions effecting quick release and braking movements of said brake shoe members, said cam actions being effected through said brake levers and said springs, whereby said brake mechanism is effective to substantially instantly cyclically stop and release a rotatable member substantially eliminating overrun and backup thereof.

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