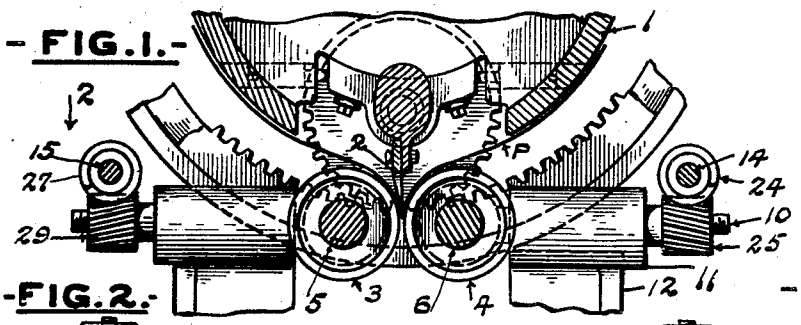
July 30, 1929. J. J. HALLIWELL 1,722,373

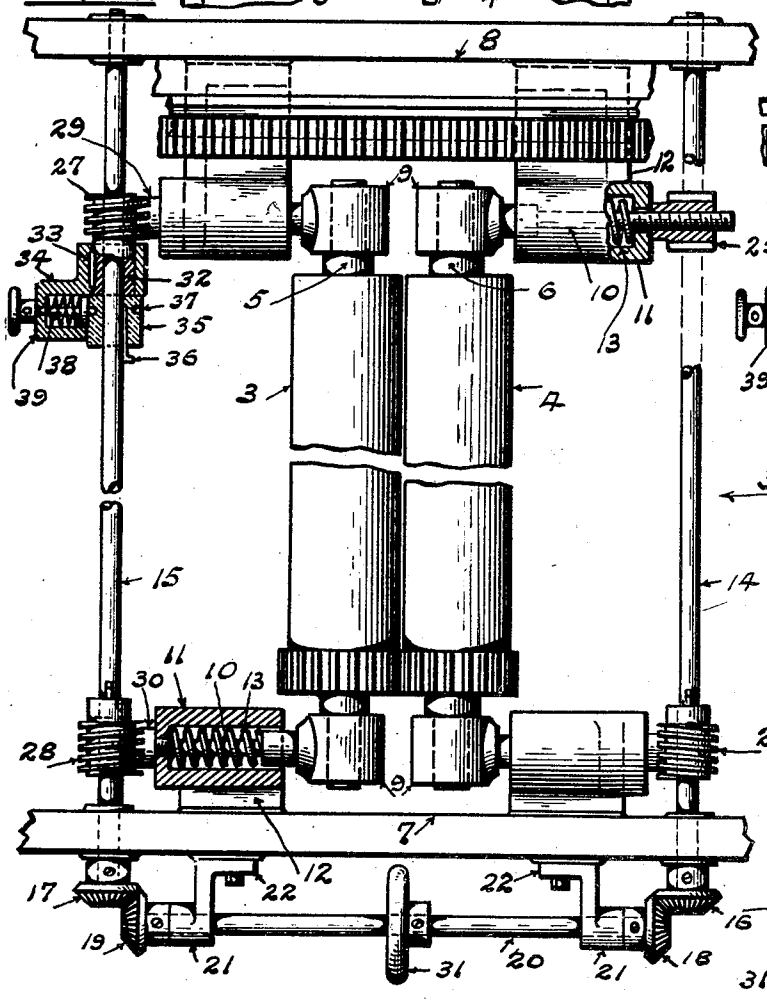
FOLDING MECHANISM

Filed Sept. 22, 1927

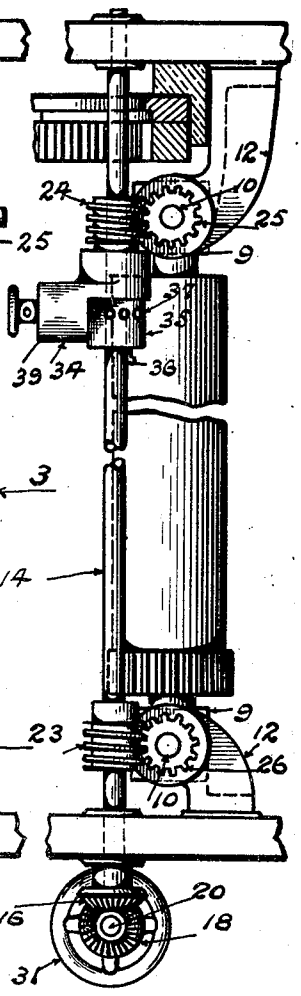
-FIG.1.-



-FIG.2.-



-FIG.3.-



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UNITED STATES PATENT OFFICE.

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FOLDING MECHANISM.

Application filed September 22, 1927. Serial No. 221,377.

This invention relates to certain improvements in folding off roll arrangements for use with rotary folding cylinders.

In rotary folding mechanisms the products are folded off from the folding cylinder into the bite of a pair of folding rolls by which a fold is given the products. It is desirable in this class of mechanisms that the folding rolls be adjustable so as to fold off products of varying thicknesses, and under certain circumstances it is desirable that the folding rolls be adjusted so that they are parallel. Under some circumstances, as when folding a very thick product, it may be desirable to adjust the rolls so that they may be somewhat out of parallelism.

It is the special object of the present invention to produce an improved construction by which the folding off rolls may be simultaneously adjusted either so that they are parallel or slightly out of parallelism. It is a further object of the invention to produce such a construction in which a resilient mounting is provided for the rolls. It is a further object of the invention to provide a simple and compact mechanism for effecting these adjustments, in which the adjustment may be quickly and readily made.

With these and other objects not specifically referred to the invention consists in certain novel parts, arrangements and combinations which will be described in connection with the accompanying drawings and the novel features pointed out in the claims hereunto annexed.

In the drawings—

Figure 1 is an end view partly in section and partly broken away of a folding cylinder and folding off rolls embodying the invention;

Figure 2 is a top or plan view, partly in section of the construction shown in Fig. 1, looking in the direction of arrow 2 of that figure; and

Figure 3 is a side view of the construction shown in Fig. 2, looking in the direction of arrow 3 of that figure.

Referring now to these drawings in detail, a folding cylinder is shown at 1 having a folding blade 2 of conventional form, which is protruded from the cylinder to fold off the product P into the bite of a pair of folding off rolls 3, 4, mounted on shafts 5, 6, the parts being supported in suitable framing indicated at 7, 8.

In accordance with the invention the shafts of the rolls 3, 4, are mounted in bearings which may be simultaneously adjusted to adjust the rolls in parallelism with each other, or may be manipulated so that the rolls are adjusted out of parallelism. While the specific construction for effecting this may be somewhat varied, the mounting for the bearings will preferably be resilient and so that the rolls may be adjusted toward and from each other. As illustrated, each roll shaft is supported at each end in a hub 9, in the sides of which are secured screw rods 10 which pass through barrels 11 on brackets 12 secured to the side frames of the machine before referred to. Where, as in the construction shown, the bearings are resiliently mounted, this is conveniently effected by the provision of springs 13 which are located about the rods inside the barrels 11.

It will be seen that by manipulating the screw rods 10 the bearings will be adjusted to effect an adjustment of the rolls. Means are provided for adjusting the bearings of each roll simultaneously, and preferably these means are such as to cause both rolls to move toward and from each other. As shown there are provided a pair of cross shafts 14, 15, one for each of the rolls, suitably supported in bearings in the side frames outside the rolls. The shaft 14 is provided with a bevel gear 16, and the shaft 15 is also provided with a bevel gear 17, these gears 16, 17 meshing with corresponding gears 18, 19 on an operating shaft 20 mounted in bearings 21 supported by brackets 22 secured to the side frame. The shaft 14 is provided with worm gears 23, 24 which mesh with gear nuts 25, 26 threaded on the screw rods 10, these gear nuts bearing against the ends of the barrels 11. The shaft 15 is also provided with worm gears 27, 28 which mesh with similar gear nuts 29, 30, on the screw rods 10 for the roll 3. The operating shaft 20 is provided with a hand wheel 31 by which it may be turned. It will be seen that on the manipulation of the shaft 20 the rolls are adjusted towards and from each other and maintained in parallel relation.

Constructions embodying the invention will include means whereby one end of one

of the rolls may be adjusted relatively to the other end so that the rolls may be out of parallel relation, and these means will include a clutch of improved construction to permit this. In the particular construction shown one of the worm gears, as the gear 27, is provided with a hub 32 which, with the gear, is loose on the shaft 15. Keyed to the hub at 33 is one member 34 of a clutch, the other member 35 of which is keyed to the shaft 15 by a key 36.

The two members of the clutch may be clutched together by means which may be somewhat varied. As shown, this is accomplished by a pin construction. The clutch member 35 is provided with a series of holes 37 with which a spring seated pin 38 is arranged to engage, this pin being mounted in a boss 39 on the clutch member 34. By releasing the pin the clutch member 34 and worm gear 27 may be rotated to adjust the bearing controlled by the gear 27 without affecting the bearing controlled by the gear 28. Thus the rolls 3 may be adjusted out of parallelism with the roll 4.

While the invention has been described in its preferred form it will be understood that certain changes and variations may be made in the construction without departing from the invention, as defined in the appended claims.

What I claim is:

1. In a folder, the combination of a folding blade, a pair of folding rolls, screw bearings in which one of the rolls is mounted, gears on the screws, a shaft, worm gears on the shaft one of which is loose thereon engaging the screw gears, and a clutch, one member of which is connected with the loose worm, and the other member of which is fast on the shaft, means for clutching the members together, and means for operating the shaft and effecting a movement of the folding rolls to and from each other.

2. In a folder, the combination of a folding blade, a pair of folding rolls, screw bearings in which both rolls are mounted, gears on the screws, a pair of cross shafts, worm gears on the shafts one of which is loose on its shaft engaging the screw gears, a clutch on one of the cross shafts one member of which is connected to the loose worm, and the other member of which is fast on the shaft, means for clutching the members together, and means for simultaneously operating the cross shafts to effect an equal movement of the folding rolls to and from each other.

3. In a folder, the combination of a folding blade, a pair of folding rolls, screw bearings in which the rolls are resiliently mounted, gears on the screws, a shaft, worm gears on the shaft engaging the screw gears, a clutch on the shaft, means for slipping the clutch to permit one bearing to be moved relatively to the other, and means for operating the shaft to permit both bearings to be adjusted simultaneously and for also effecting an equal movement of the folding rolls to and from each other.

4. In a folder, the combination of a folding blade, a pair of folding rolls, screw bearings in which the rolls are resiliently mounted, gears on the screws, a shaft, worm gears on the shaft one of which is loose thereon engaging one of the screw gears, a clutch, one member of which is connected to the loose worm and the other member of which is fast to the shaft, a pin connecting the clutch members, and means for operating the shaft, said means also acting to effect an equal movement of the folding rolls to and from each other.

5. In a folder, the combination of a folding blade, a pair of folding rolls, screw bearings in which both the rolls are resiliently mounted, gears on the screws, a pair of cross shafts, worm gears for the shaft, one of said gears being loose on its shaft, a clutch, means for slipping the clutch to permit the gear to be moved relatively to the shaft, an operating shaft, and gear connections between the operating shaft and the cross shafts for operating the cross shafts to effect an equal movement of the folding rolls to and from each other.

6. In a folder, the combination of a folding blade, a pair of folding rolls, screw bearings in which both the rolls are spring mounted side by side, gears on the screws, a pair of cross shafts arranged outside the rolls, an operating shaft common to the cross shafts, worm gears on the cross shafts, one of said gears being loose on its shaft, a pin clutch for clutching the gear to the shaft, and means controlled by the operating shaft for effecting an equal movement of the folding rolls to and from each other.

In testimony whereof I have hereunto set my hand.

JOHN J. HALLIWELL.