Dec. 2, 1941. J. E. MEYER 2,264,707

FOLDER

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Fig. 1.

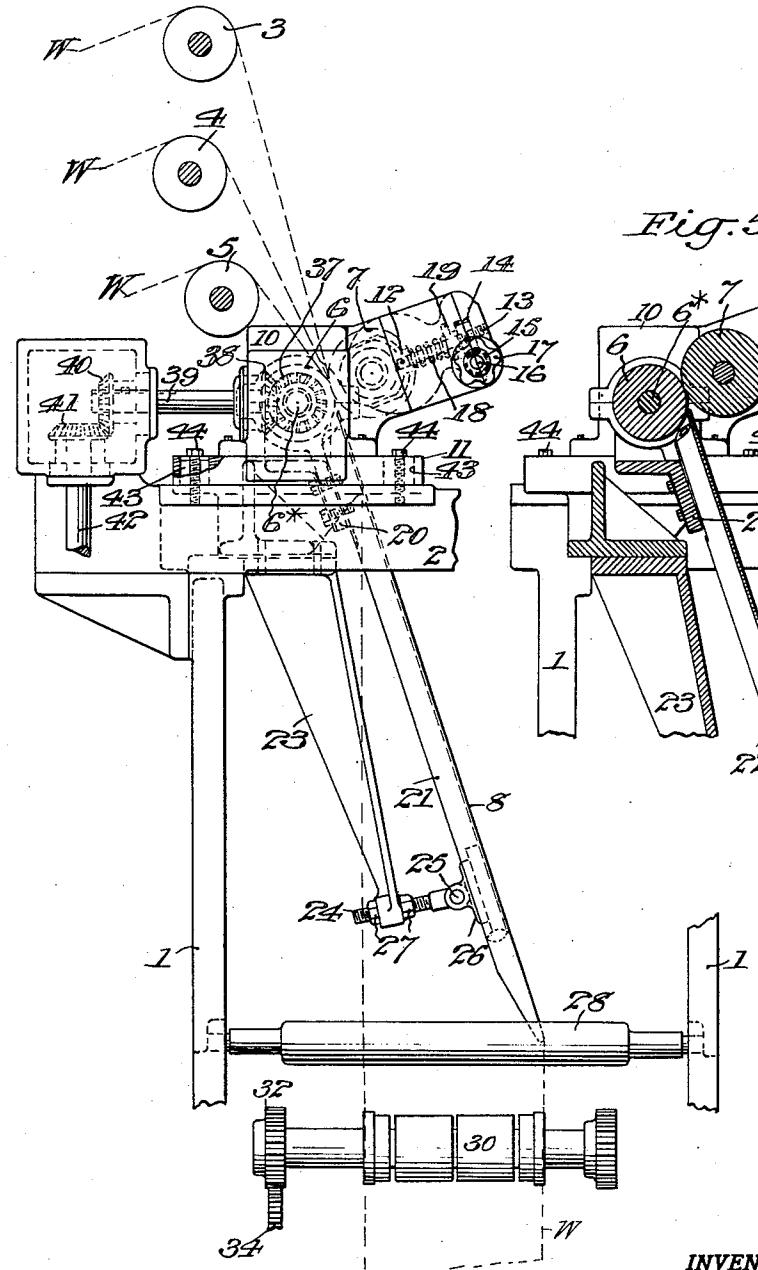


Fig. 5.

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Fig. 2.

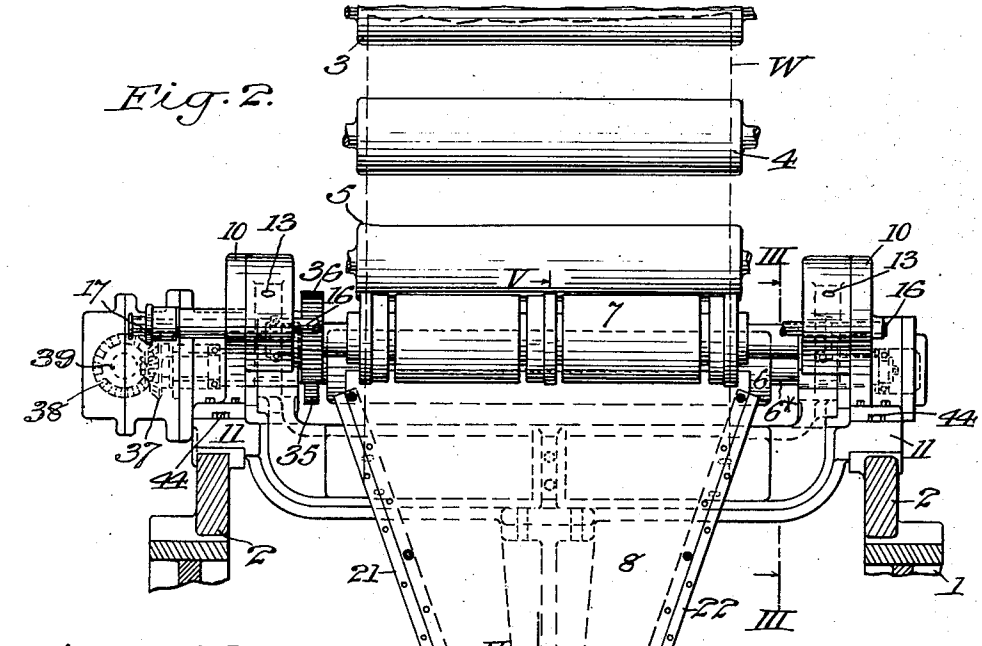


Fig. 3.

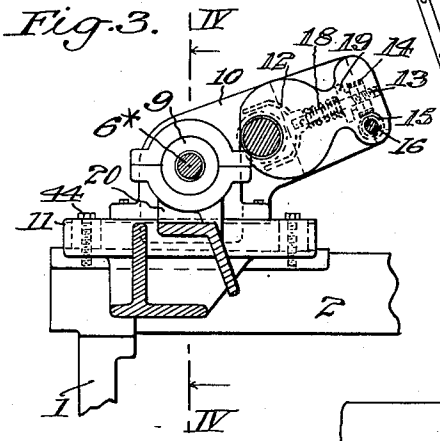
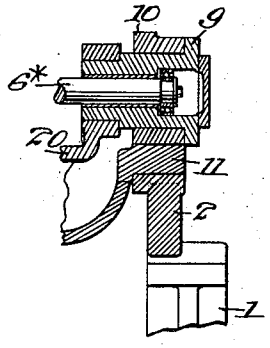
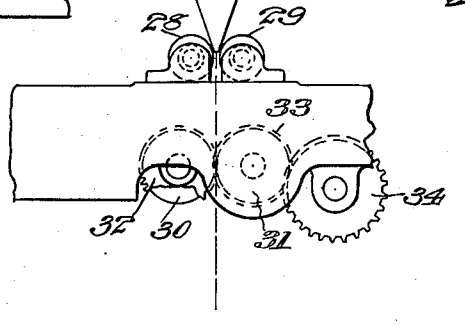


Fig. 4.





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FOLDER

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Application April 23, 1940, Serial No. 331,123

13 Claims. (Cl. 270—86)

In folders embodying former plates it has heretofore been usual to hold a friction roll against a positively driven roll over the former plate for drawing associated webs up to the former and then across the former nose by nipping rolls, thereby imparting a longitudinal fold to the webs. This method has been found unsatisfactory in that the wrap of the webs on the driven roll over the former plate causes the several webs to wander laterally, one over the other, especially when coated stock or any highly finished magazine paper is used. This wandering throws the webs out of fold at the former nose, the result being that former folders have not been satisfactory for accurate folding in magazine work where the margins are small.

The object of my invention is to provide a folder embodying a former plate in which great accuracy is obtained in the folding of associated webs due to the substantial elimination of the wrap of the webs on a driven roll and the consequent stopping of the wandering of one over the other.

Another object of my invention is to provide a folder of the type described in which the former plate is capable of adjustment to obtain the proper angle thereof without disturbing the tangency of the plate to the upper driven nipping rolls.

Another object of my invention is to provide a former folder in which the former plate, its supports and a driven roll's bearings are carried on a slidable cross member and adapted to be shifted as a unit to a predetermined position with respect to the cutting and delivery mechanisms.

A further object of my invention is to provide means for maintaining proper driving connections for the upper driven rolls during any adjustment or movement of the former plate.

My invention comprises, generally, a folder including in combination an adjustably supported former plate and cooperating web advancing means located above and below the former plate respectively, whereby the above and other objects may effectively be attained.

A practical embodiment of my invention is shown in the accompanying drawings, in which

Fig. 1 represents a side elevation of a former folder embodying my invention;

Fig. 2 represents a front elevation of the embodiment shown in Fig. 1, transverse frames being shown in section and a portion of the drive being omitted;

Fig. 3 represents a transverse vertical section taken on the line III—III of Fig. 2, looking in the direction of the arrows;

Fig. 4 represents a transverse vertical section taken on the line IV—IV of Fig. 3 looking in the direction of the arrows; and

Fig. 5 represents a transverse vertical section taken on the line V—V of Fig. 2, looking in the direction of the arrows.

The vertical folder frames are denoted by 1 and the cross frames by 2. Guide rollers 3, 4, 5 are located above the former for associating a plurality of webs, in the present instance three, at the point of contact of a pair of positively driven nipping rolls 6 and 7, said rolls being located above the former plate 8.

The roll 6 is mounted in ball bearing adjusters 9 which support the shaft 6* rotatably journaled therein, said adjusters 8 being carried in brackets 10 mounted on an adjustable cross member 11.

The adjustable cross member 11 is provided with slots 43 through which set screws 44 pass and said screws are threaded into the frame 2 to hold the cross member in any desired adjustment.

The roll 7 is mounted in spring seated sockets 12 and means for adjusting the contact pressure of roll 7 with roll 6 comprises the shank 13 threaded at its outer end, a gear 14 threaded thereon adapted to mesh with the worm 15 on the shaft 16 turned by a hand wheel 17, said mechanism acting in the usual manner to control pressure on the spring 18 mounted on shank 13 between socket 12 and collar 19.

The former plate 8 is swingably and adjustably supported by upper and lower supports. The upper plate support 20 is hung on the adjusters 9 so as to be swingable about the axis of the roll 6 and is shaped to hold the former plate in substantial tangency to the rolls 6 and 7. The outer edges of the former plate are supported and fixed to side bars 21, 22 which may be of any well known or approved construction. The lower end of the plate 8 is adjustably supported as follows: arm 23 is carried by and depends from the adjustable cross member 11, the lower end of said arm being adapted to receive a threaded element 24 pivoted at 25 in a fixture 26 affixed to the plate 8. The threaded element 24 is provided with nuts 27 at each side of arm 23 for holding the plate 8 at the desired angle.

Nipping rolls 6 and 7 are positively driven at the same surface speed through their meshed gears 35, 36. Gear 35 is mounted on shaft 6* which is driven by coaction of bevel gear 37 thereon with bevel gear 38 on shaft 39. Gear 40 on shaft 39 meshes with gear 41 on shaft 42 which is driven from any suitable source of power, not shown herein. The gear 40 is keyed and arranged to slide on shaft 39 which is slotted at its outer end (see Fig. 1) in order to maintain proper driving connections when cross member 11 is moved.

Guide rollers 28 and 29 are mounted below the former plate and at right angles to the upper nipping rolls 6 and 7 in order to lead the creased associated webs from the former nose to and between the lower pair of nipping rolls

30, 31 to complete the fold. From these rolls the folded webs are passed to the cutting and delivery mechanisms, not shown herein. The rolls 30, 31 are driven at the same surface speed through the coaction of gears 32, 33, the latter meshing with and being driven from gear 34, said gear being driven from any suitable source, not shown herein.

In operation, a plurality of webs W are led from the upper guide rollers 3, 4, 5 to and between the upper pair of positively driven nipping rolls 6, 7. The contact pressure of roll 7 may be regulated as described above. The webs having been associated at the point of contact of rolls 6 and 7 are drawn over the former plate 8 by the cooperation of the lower nipping rolls 30, 31 which pull the webs over the former plate nose and between guide rollers 28, 29 and impart a longitudinal fold to the associated webs. The former plate may be adjusted to secure the proper angle as described above and the plate, upper roll bracket mounting, and plate supports may be adjusted as a unit by moving the adjustable cross member 11 forward or back as above described, in order to secure the proper lead of the webs to the cutting and delivery mechanisms, not shown.

It can be seen from the above that I have provided a folder which insures accuracy by substantially eliminating the wrap of associated webs on the driven rolls and thereby greatly decreasing the tendency of the webs to wander laterally, one over the other, and thus be thrown out of fold at the former nose.

It is to be understood that a single web only may be run through the folder, if so desired.

It is evident that various changes may be resorted to in the construction, form and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the particular embodiment herein shown and described.

What I claim is:

1. A folder including in combination an adjustably supported former plate, and cooperating web advancing means located above and below the former plate respectively, said cooperating means comprising upper and lower pairs of positively driven nipping rolls.

2. A folder including in combination an adjustably supported former plate, and cooperating web advancing means located above and below the former plate respectively, said cooperating means comprising upper and lower pairs of positively driven nipping rolls and said former plate being substantially tangent to said upper pair of nipping rolls.

3. A folder including in combination an adjustably supported former plate, cooperating web advancing means located above and below the former plate respectively, said cooperating means comprising upper and lower pairs of positively driven nipping rolls, and means for adjusting the contact pressure of one of said upper pair of nipping rolls.

4. A folder including in combination an adjustably supported former plate and cooperating web advancing means located above and below the former plate respectively, said cooperating means comprising upper and lower pairs of positively driven nipping rolls and said upper nipping rolls coacting to associate a plurality of webs.

5. A folder including in combination a former plate, an upper swingable and a lower adjustable support for said plate, and cooperating web advancing means located above and below the former plate respectively, said means including an upper and a lower pair of nipping rolls, and a series of guide rolls located above the former plate for leading the webs to the point of contact of the upper nipping rolls.

6. A folder including in combination a former plate, an upper swingable and a lower adjustable support for said plate, cooperating web advancing means located above and below the former plate respectively, and means for adjusting the lower support while maintaining substantial tangency between the plate and the upper nipping rolls.

7. A folder including in combination a former plate, upper and lower supports for said plate, a cross member adjacent the upper end of said plate, said lower support depending from said cross member, and cooperating web advancing means located above and below the former plate respectively.

8. A folder including in combination a former plate, cooperating web advancing means including upper and lower pairs of positively driven nipping rolls, a bracket for the mounting of one of the upper rolls, and a movable cross member for supporting said bracket.

9. A folder including in combination a former plate, cooperating web advancing means including upper and lower pairs of positively driven nipping rolls, a bracket for the mounting of one of the upper rolls, a movable cross member for supporting said bracket, and means for manually adjusting the cross member.

10. A folder including in combination a former plate, cooperating web advancing means including upper and lower pairs of positively driven nipping rolls, a bracket for the mounting of one of the upper rolls, a movable cross member for supporting said bracket, means for manually adjusting the cross member, a drive for the upper nipping rolls, and means for maintaining proper driving connections with said rolls during movement of the cross member.

11. A folder including in combination a former plate, upper and lower supports therefor, web advancing means comprising upper and lower pairs of positively driven nipping rolls, brackets, and mountings therein for one of the upper rolls, said upper plate support being swung on said mountings.

12. A folder including in combination a former plate, upper and lower supports therefor, web advancing means comprising upper and lower pairs of positively driven nipping rolls, brackets, mountings therein for one of the upper rolls, said upper plate support being swung on said mountings, an adjustable cross member for supporting the mountings, and means for adjusting the former plate, plate supports, brackets and cross member as a unit.

13. A folder including in combination a former plate, upper and lower plate supports, web advancing means comprising upper and lower pairs of positively driven nipping rolls, brackets, mountings for an upper roll carried in said brackets, said upper plate support being swung on said mountings, a main frame, and a cross member slidable thereon, said brackets being carried by said cross member.

JOSEPH E. MEYER.