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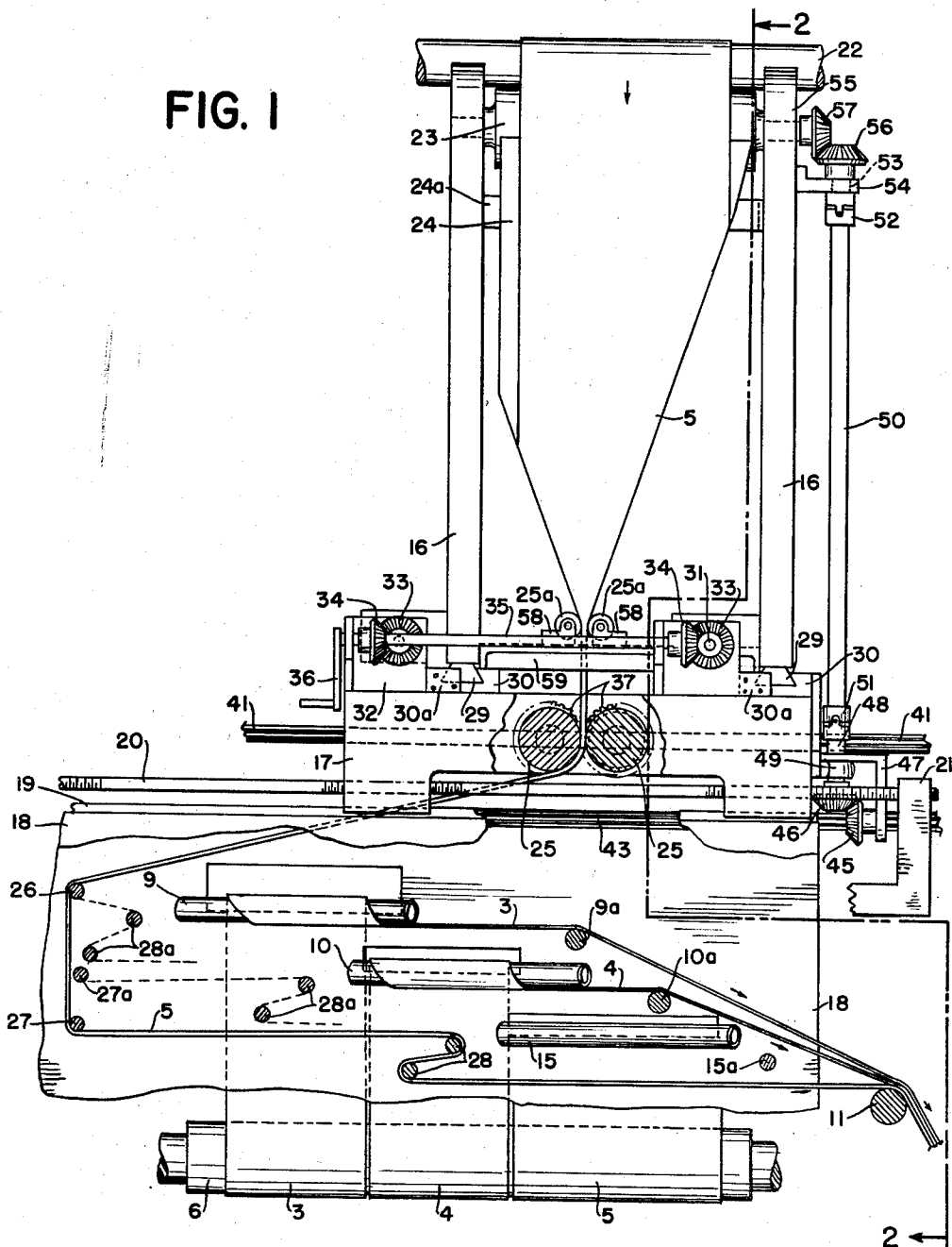
2,908,494

WEB ASSOCIATER AND FOLDER

Filed May 15, 1957

2 Sheets-Sheet 1

FIG. 1



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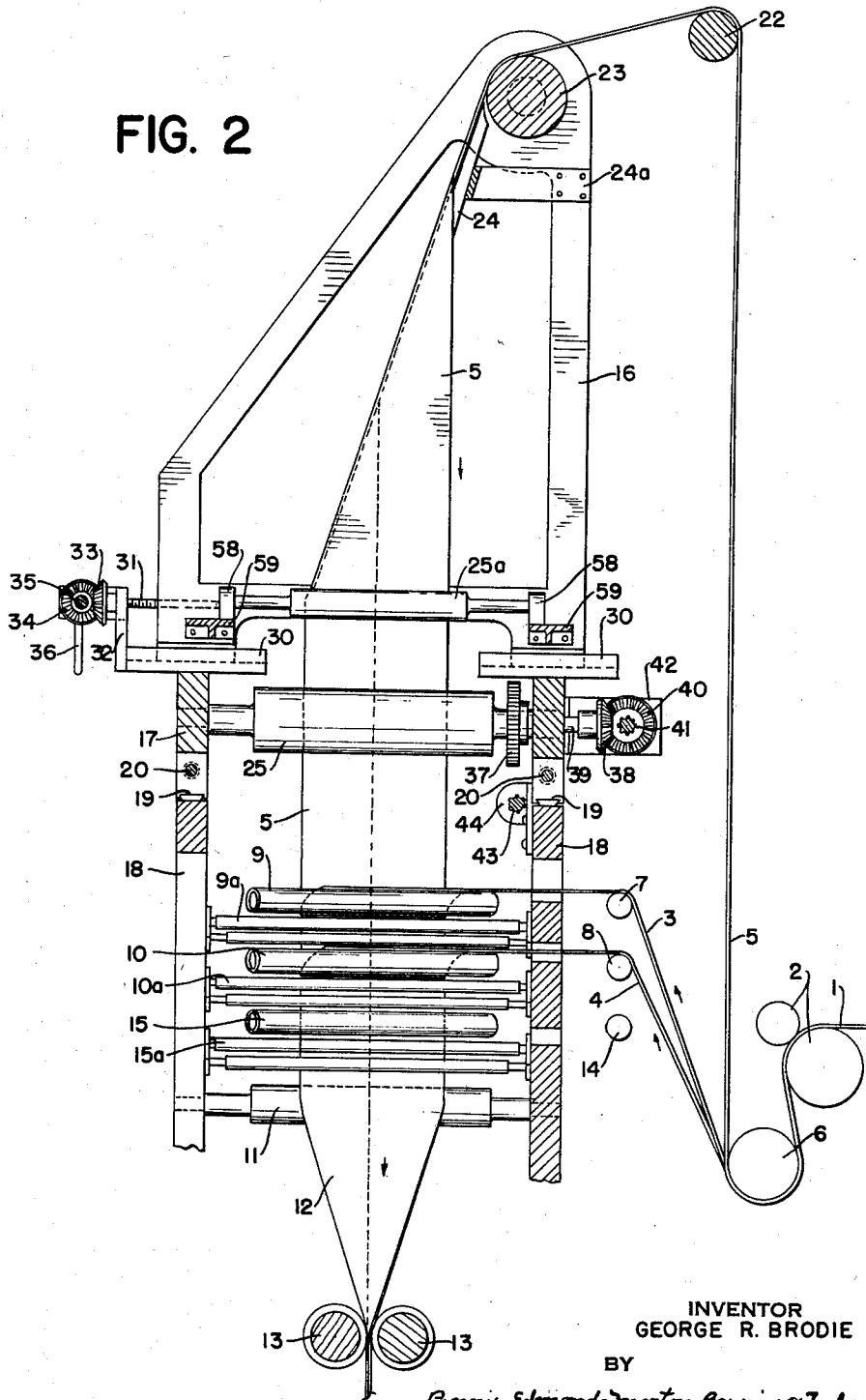
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FIG. 2



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WEB ASSOCIATER AND FOLDER

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4 Claims. (Cl. 270—41)

This invention relates to improvements in folding mechanisms used in conjunction with web-fed printing presses. It relates more particularly to mechanisms especially adapted to use in conjunction with conventional cutting and folding mechanisms whereby the web is first slit longitudinally into ribbons and the respective ribbons automatically aligned and brought together and thereafter passed together over a former for effecting a longitudinal fold in the assembled ribbons, usually along their centerline.

It is frequently desirable to produce what is known as a gate fold in one of the ribbons before they are assembled either for the purpose of increasing the size of a regular page in the printed publication by folding inwardly the unbound edge of the page, in which case the gate fold is less than half the width of the ribbon, or for producing an additional page where the gate fold is equal to half the width of the ribbon. The latter has been found especially desirable where the web is of such width, with respect to the desired page size of the finished publication, that it is impractical to divide the web into ribbons of equal width.

The present invention provides novel and highly useful mechanisms whereby a gate fold of any desired width may be made in any one of the ribbons passing from the cutter roller to the conventional former.

This improved mechanism in general comprises a gate fold former and associated rolls mounted on a frame adjustably supported, advantageously by the side frames of the cutting and main folding mechanism, and adapted to be readily moved transversely with respect to the path of the web entering the main folder so that any one of the several ribbons may be passed through the gate folder and thereby folded at any desired position with respect to the width of that particular ribbon.

According to the preferred embodiment of the invention, the gate folding mechanism is adapted to be moved transversely of the web so as to receive anyone of the several ribbons as stated above. However, the invention contemplates mechanism wherein the movement of the gate folder is more restricted in that it is adapted to be moved transversely with respect to a single ribbon.

The invention will be further described and illustrated with reference to the accompanying drawings which represent conventionally, and somewhat diagrammatically, a presently preferred embodiment of the invention and of which:

Fig. 1 is a front view of my gate folder showing its relation to conventional aligning and folding mechanism, and partly broken away to show pertinent inner portions thereof, and

Fig. 2 is a side view along the line 2—2 of Fig. 1.

The incoming web 1 passes from the press through conventional slitting means indicated at 2, comprising a slotted roll and cooperating slitting blades, whereby the web is cut into longitudinal ribbons, for instance three ribbons indicated by the reference numerals 3, 4 and 5. Ribbons 3 and 4 are of equal width and ribbon 5 is some-

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what wider. These ribbons pass from roll 2 around roll 6 and thence ribbons 3 and 4 pass over rolls 7 and 8, respectively, and then over adjustable angle bars 9 and 10, respectively, in accordance with conventional practice, whereby the ribbons 3 and 4 are aligned and pass from the angle bars over rolls 9a and 10a and are then passed together over roll 11. From roll 11 the assembled ribbons pass over a conventional former indicated at 12 for effecting the longitudinal folding of the assembled ribbons. The folded ribbons then pass between creasing rolls 13.

Ribbon 5, being of greater width than ribbons 3 and 4, instead of being passed over roll 14, angle bar 15 and roll 15a, is passed to the gate folder of my present invention. While the invention will be illustrated as effecting a gate fold in ribbon 5, the position of my gate folder is adjustable, as hereinafter described, so as to receive and fold any one of the ribbons and to position the gate fold therein at any desired distance from either of the side edges of the selected ribbon.

My improved gate folder is adapted to be used in conjunction with conventional folders and comprises side frames 16 adjustably supported by a base frame 17 which in turn is adjustably supported, advantageously by the main folder side frames 18 and keyed thereto by tracks 19, as more clearly appears in Fig. 2, and adapted to be moved along the tracks by rotation of elongated screws 20 which are threaded through the base frame 17. These screws 20 are supported at each end and secured against longitudinal movement by brackets represented at 21, said brackets being secured to frame 18 of the main folder. The tracks 19 and screws 20 are of sufficient length to enable the gate folder to be moved transversely of the web to coincide with the path of any one of the ribbons by turning the screws 20 by any suitable means, not shown, for instance a hand crank. It is desirable that the rotation of the screws 20 be coordinated. Means for accomplishing this are well known to the art and need not here be described.

With my gate folder in the position shown in the drawings, the ribbon 5 is passed from roll 6 over guide roll 22 and thence over roll 23 rotatably supported between gate folder side frames 16. From roll 23, the ribbon 5 passes over the former 24, also supported by side frames 16 by means of brackets 24a. In passing over the former, the ribbon is folded longitudinally at the predetermined position and then passes between the former rolls 25a, adjustably supported as hereinafter described, and then between creasing rolls 25 rotatably supported between the base frames 17.

From the creasing rolls 25, the gate folded ribbon is passed around guide rolls 26 and 27 and take-up rolls 28 and then passes over roll 11 together with ribbons 3 and 4.

It is usually required that at least one edge of gate folded ribbon 5 be aligned with the corresponding edges of ribbons 3 and 4 before being passed to roll 11. For accomplishing this purpose, I provide means for moving the former 24 in a direction parallel to the bite between the creasing rolls 25 so as to shift the folded ribbon longitudinally of those rolls which, in turn, will shift the position of folded ribbon 5 transversely of ribbons 3 and 4 passing over roll 11.

This is accomplished in the specific apparatus shown by mounting the side frames 16 so that their position may be adjusted with respect to base 17 along a plane perpendicular to the plane of adjustment of the base 17 previously described.

As shown in the drawings, the side frames 16 are keyed to slides 30 secured to base frame 17 and extending perpendicular to slides 19 previously described. Adjustment screws 31 are threaded into side projections of frames 16 and are supported at their outer ends, and

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secured against longitudinal movement, by brackets 32 secured to the outer ends of the left-hand slide tracks 30, by plates 30a as shown in Fig. 2. Secured to the outer ends of screws 31 are beveled gears 33, and the rotation of the two screws is coordinated by cooperating beveled gears 34 secured to shaft 35. This shaft is also supported by brackets 32 and is provided with a hand crank 36 by which screws 31 may be rotated to cause frames 16 to move in the desired direction along tracks 30 thus effecting the aligning of folded ribbon 5 with ribbons 3 and 4.

The creasing rolls 25 are geared together by cooperating gears 37 and are driven through beveled gear 38, secured to roll shaft 39, and cooperating beveled gear 40 keyed to be driven by spline shaft 41 and adapted to slide along said shaft as the position of the gate folder is adjusted transversely of the web. Shaft 41 is rotatably supported at each end and is adapted to be driven by conventional means.

Beveled gear 40 is supported and held in mesh with gear 38 by means of bracket 42 secured to the base 17 and adapted to move therewith.

The roll 23 may be driven by any suitable means. Advantageously it is driven through means supported by base 17 so that the driving connection would not be disrupted by the moving of the gate folder transversely of the web. However, where the driving means is attached to base 17, provision should be made for the adjustment of side frames 16 with respect to base 17. Usually the latter adjustment will involve a movement not exceeding one inch in either direction from the center position. In such case, a drive connection through one or more universal joints, as shown in the drawings, may be used satisfactorily.

In the apparatus shown, I provide spline shaft 43 extending the length of the folder and supported at each end by brackets 44 secured to side frames 18 of the main folder and driven by any suitable means, not shown.

Beveled gear 45 is keyed to, and adapted to slide along, shaft 43 and is rotatably held in position to mesh with cooperating beveled gear 46 by means of bracket 47 secured to the gate folder base 17. Gear 46 is secured to the lower end of shaft 48 and is rotatably supported by brackets 47 and 49 secured to the base 17. Shaft 48 is connected to shaft 50 through universal joint 51. The other end of shaft 50 is connected through universal joint 52 to shaft 53 rotatably supported by bracket 54 secured to side frame 16 and connected with shaft 55 to roller 23 through cooperating beveled gears 56 and 57.

The former rolls 25a are rotatably supported at each end by separate bearing brackets 58 adjustably mounted on cross braces 59 in any suitable manner, as by means of bolts. The braces 59 are secured to the gate folder side frames 16, as by welding or riveting, as more clearly shown in Fig. 1 of the drawings.

In the operation illustrated, the ribbon 5 in which the gate fold has been made is the lowermost ribbon passing over roll 11. However, by changing the path of the ribbon leaving roll 26, for instance by passing it to rolls 28a or rolls 27a and 28b, as shown in dotted lines in Fig. 1, ribbon 5 may be caused to pass to roll 11 either above or between ribbons 3 and 4. It will be understood that the invention is not restricted as to the number of ribbons being passed to roll 11 in addition to that being passed through my gate folder.

It will be understood that the invention is not restricted to the particular embodiment thereof, herein specifically described by way of illustration, but contemplates the use of equivalent cooperating means or parts within the scope of the appended claims.

I claim:

1. In conjunction with slitting and folding mechanism for web-fed printing presses comprising means for slitting the entering web longitudinally into a plurality of ribbons

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and for passing the respective ribbons along separate paths over angle bars positioned in the respective paths thereof and adapted to align the edges of, and assemble, the ribbons and means for passing the aligned and assembled ribbons along a path perpendicular to the path of the entering web to a main former for folding the combined and aligned ribbons longitudinally, improved means for making a gate fold in one of the ribbons and for aligning and assembling the gate-folded ribbon with the other ribbons passing to the main former, which comprises a gate former adjustably supported to coincide with the path of one of the entering ribbons and adjustable with respect to the path of the assembled ribbons passing to the main former, means for passing said one ribbon over the gate former, means including rolls for passing the folded ribbon from the gate former and combining it with the other ribbons passing to the main former, means for moving the gate former transversely with respect to the path of said ribbon to be gate-folded, whereby the position of the gate fold may be varied at will, and means for moving the gate former transversely with respect to the path of the aligned ribbons passing from the angle bars to the main former to align the gate-folded ribbon with the other ribbons passing to the main former.

2. In conjunction with cutting and folding mechanism for web-fed printing presses comprising means for cutting the entering web longitudinally into a plurality of ribbons and for passing the respective ribbons along separate paths over angle bars positioned in the respective paths thereof and adapted to align the edges of, and assemble, the ribbons and means for passing the aligned and assembled ribbons along a path perpendicular to the path of the entering web to a main former for folding the combined and aligned ribbons longitudinally, improved means for making a gate fold in one of the ribbons which comprises a gate former bar adjustably supported to coincide with the path of one of the ribbons, a roller in the path of said ribbon preceding the gate former bar, said gate former bar and said roller being supported by gate folder supporting-brackets which are, in turn, supported by the side frames of the first said cutting and folding mechanism, means for moving said brackets transversely with respect to the path of the web leaving the cutter and means for moving the roller and gate former bar with respect to said supporting-brackets in a direction at right angles to the first said adjustment.

3. The mechanism of claim 1 further characterized in that the gate former is adapted to be moved into the path of any one of the plurality of ribbons and transversely with respect to the path of that ribbon.

4. In conjunction with slitting and folding mechanism for web-fed printing presses comprising means for slitting the entering web longitudinally into a plurality of ribbons and for passing the respective ribbons along separate paths through a main folder comprising angle bars positioned in the paths of the respective ribbons adapted to align the edges of, and assemble, the ribbons and means for passing the aligned assembled ribbons along a path perpendicular to the path of the entering web to a main former for folding the combined and aligned ribbons longitudinally, improved means for making a gate fold in one of the ribbons comprising a gate former positioned above the angle bars of the main folder, said gate folder comprising a base frame supported by the main folder and adapted to be moved horizontally along the main folder in a direction transversely of the entering web, gate folder side frames positioned on said base frame and adapted to be moved horizontally along said base frame in a direction perpendicular to the direction of said movement of the base frame, a roll rotatably supported by said side frames with its axis of rotation extending transversely of the entering web, a gate former supported by said side frames below said roll, a pair

of creasing rolls positioned beneath the gate former rotatably supported by the base frame with their axis of rotation perpendicular to the axis of the first said roll, means for moving the base frame along the main folder over a distance substantially co-extensive with the width of the entering web, means for moving the gate folder side frames with respect to said base in a direction parallel to the bite between the creasing rolls, means for rotating

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the creasing rolls and means for rotating the first said roll.

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