

Aug. 13, 1940.

H. M. BARBER

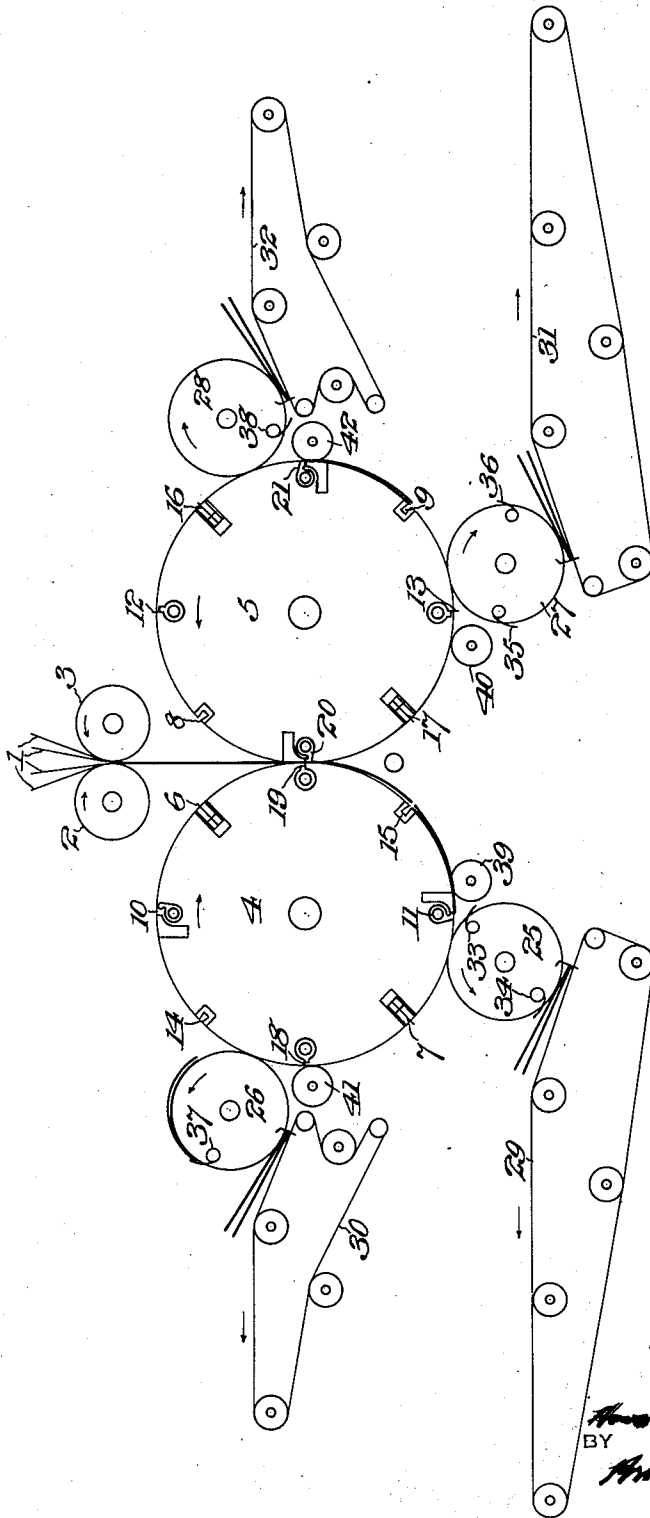
2,211,046

CUTTING AND FOLDING MACHINE

Filed April 1, 1938

2 Sheets-Sheet 1

Fig. 1.



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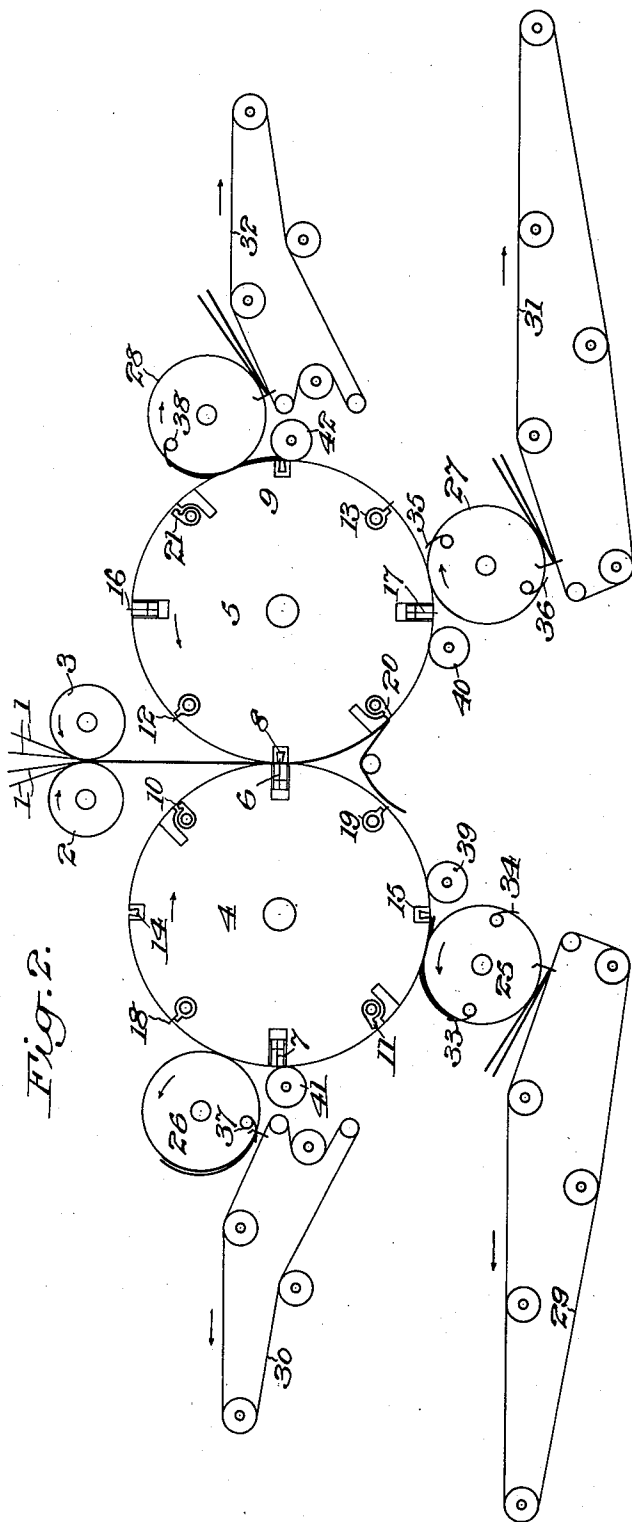


Fig. 2:

Fig. 3.

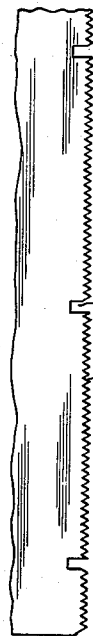


Fig. 4.



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CUTTING AND FOLDING MACHINE

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R. I., a corporation of Delaware

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7 Claims. (Cl. 270—63)

In high speed folders where signatures are cut from a web or associated webs it has been usual to provide impaling pins for carrying the leading ends of the web or webs around collecting or folding cylinders. The use of these impaling pins has been a detriment, especially in high grade magazine work because of the necessity of using extra paper so that the pin holes will come outside of the trim.

The object of my invention is to eliminate the impaling pins and their delicate operating mechanisms which are, of themselves, speed curtailing elements.

My invention comprises, generally, means for feeding a web or associated webs to a pair of cutting and folding cylinders having coacting cutting and folding devices, the cutting devices serving to almost sever successive signatures from the web or webs, and the folding devices serving to fold the alternate signatures to each cylinder and to tear the signature, as it is being folded, from the next preceding signature, thereby causing one signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder.

My invention also comprises lower and upper deliveries for each of the cutting and folding cylinders, it being intended to deliver one folded signature to the lower delivery and the next folded signature to the upper delivery, or, if so desired, to deliver all of the signatures (one-half of the product) to one of the deliveries, as for instance the lower delivery.

A practical embodiment of my invention is represented in the accompanying drawings, in which a plurality of associated webs are shown as fed to the cutting and folding cylinders.

Fig. 1 represents in diagrammatic side elevation a folder showing one pair of coacting folding devices in the act of folding a group of sheets to one of the cutting and folding cylinders and at the same time tearing the leading ends of the sheets of that group from the tail ends of the sheets of the next preceding folded group carried by the other cutting and folding cylinder;

Fig. 2 represents a similar view with the coacting folding and cutting cylinders advanced one-eighth of a revolution and showing one pair of coacting cutting devices operating to almost sever a group of sheets carried by one cylinder, from the associated webs being fed into the folder;

Fig. 3 represents a face view of a knife having

a serrated edge with a plurality of cut-out portions therein; and

Fig. 4 represents a detail plan view of a web showing the type of cut made by the knife to almost sever the sheets therefrom.

The traveling webs are denoted by 1 and the pair of coacting web associating and feeding rolls by 2, 3. The pair of coacting cutting and folding cylinders 4, 5 may be driven at a predetermined speed by any well known or approved means, not shown herein.

Each of the cutting and folding cylinders 4, 5 carries at equally spaced distances around its periphery two diametrically opposed cutting knives, two diametrically opposed folding jaws, two diametrically opposed cutting blocks, and two diametrically opposed folding blades. The cutting knives 6 and 7 on the cylinder 4 coact with their respective cutting blocks 8 and 9 on the cylinder 5. The folding jaws 10, 11 on the cylinder 4 coact with their respective folding blades 12, 13 on the cylinder 5. The cutting blocks 14, 15 on the cylinder 4 coact with the cutting knives 16, 17 on the cylinder 5. The folding blades 18, 19 on the cylinder 4 coact with the folding jaws 20, 21 on the cylinder 5. These several devices serve to almost sever successive signatures from the associated webs, to fold alternate signatures to each cylinder, and to tear the signature which is being folded on one cylinder, away from the next preceding folded signature on the other cylinder.

The cutting knife is shown as having a serrated cutting edge 22 with a plurality of cut-out portions 23 along the same, to leave short uncut portions 24 between the sheets and webs as the sheets are almost severed from the webs.

I have provided lower and upper deliveries for each of the cutting and folding cylinders. Delivery cylinders 25, 26 are arranged to coact with the cutting and folding cylinder 4, and delivery cylinders 27, 28 are arranged to coact with the cutting and folding cylinder 5. Endless delivery carriers 29, 30, 31, 32 are arranged to coact with their respective delivery cylinders 25, 26, 27 and 28, to advance the folded signatures outwardly, away from the folding mechanism. The lower delivery cylinders 25 and 27 are each provided with two sets of diametrically opposed grippers 33, 34 and 35, 36, respectively. The upper delivery cylinders 26 and 28 are each provided with a single set of grippers 37 and 38, respectively.

Pressure rollers 39 and 40 serve to hold the folded signatures against their respective cutting and folding cylinders 4 and 5 while the signatures are being transferred to the delivery cylinders 25

and 27. Similarly, pressure rollers 41, 42 serve to hold the folded signatures against their respective cutting and folding cylinders 4 and 5 while the signatures are being transferred to the delivery cylinders 28 and 29.

In operation: The associated webs 1 are fed between the cutting and folding cylinders 4 and 5, and their coacting cutting devices almost sever successive signatures from the webs. The folding devices on the cutting and folding cylinders 4 and 5 serve to fold alternate signatures to each cylinder where the folded signatures on each cylinder are carried forward by their folding jaws and transferred either to the cylinders of the lower and upper deliveries for that cutting and folding cylinder, or all of the folded signatures on that cutting and folding cylinder are transferred to the folding cylinder of the lower delivery only. It will thus be seen that one-half of the product is handled by each cutting and folding cylinder and its lower and upper deliveries.

It will be understood that the delivery cylinders and endless carriers are driven in the usual manner and that the delivery cylinders are driven at the required surface speed to take the folded signatures at the proper times from the folding jaws of their respective cutting and folding cylinders.

It will also be understood that the several sets of grippers are operated or silenced in the usual manner to ensure the transfer of the folded signatures from their cutting and folding cylinder for delivery either to both the lower and upper deliveries or to one of said deliveries, as above described.

From the above description it will be understood that as one signature is folded on to one of the cutting and folding cylinders the leading ends of the sheets of the said signature being folded are torn from the tail ends of the sheets which comprise the next preceding folded signature on the other cutting and folding cylinder. This obviates the necessity of using impaling pins on the two cutting and folding cylinders as is usual for temporarily holding the leading ends of the webs or sheets thereon.

It will also be understood that the cutting and folding devices may be of any well known or approved form and may be operated in the well known manner by suitable means, not shown herein.

It will also be understood that by the term "rotary cylinder" as used herein, I intend to include rotary carriers of any form, capable of advancing the webs and sheets in the desired paths.

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, but what I claim is:

1. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, cutting devices on said cylinders operating to almost sever successive signatures from the web or webs, folding devices on said cylinders operating to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next suc-

ceeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and means for delivering the folded signatures from each cutting and folding cylinder to two points.

2. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, cutting devices on said cylinders operating to almost sever successive signatures from the web or webs, folding devices on said cylinders operating to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and means for delivering the folded signatures from each cutting and folding cylinder to two points or to one point.

3. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, cutting devices on said cylinders operating to almost sever successive signatures from the web or webs, folding devices on said cylinders operating to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and lower and upper deliveries for each cutting and folding cylinder, operable to take alternate signatures from the cylinder and deliver them to two points.

4. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, cutting devices on said cylinders operating to almost sever successive signatures from the web or webs, folding devices on said cylinders operating to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and lower and upper deliveries for each cutting and folding cylinder, operable to take alternate signatures from the cylinder and deliver them to two points, or one delivery operable to take successive signatures from the cylinder and deliver them to one point only.

5. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, cutting devices on said cylinders operating to almost sever successive signatures from the web or webs, folding devices on said cylinders operating to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and lower and upper deliveries for each cutting and folding cylinder, operable to take alternate signatures from the cylinder and deliver them at two points, or the lower delivery

operable to take successive signatures from the cylinder and deliver them to one point only.

6. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, coacting cutting knives and blocks carried by said cylinders and arranged to almost sever successive signatures from the web or webs, coacting folding blades and jaws also carried by said cylinders and arranged to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding folded signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and lower and upper deliveries for each cutting and folding cylinder, each delivery comprising an endless delivery carrier and a rotary delivery cylinder arranged to take the folded signatures from the cutting and folding cylinder and to transfer them to the endless delivery carrier.

7. In a folder, a pair of cutting and folding cylinders, means for feeding a web or associated webs thereto, two cutting knives and two cutting blocks carried by each cylinder and arranged to almost sever signatures from the web or webs, two folding blades and two folding jaws also carried by each of said cylinders and arranged to fold alternate signatures to each cylinder and to tear each signature, as it is being folded, from the next preceding folded signature, thereby causing the folded signature to carry the leading end or ends of the web or webs partly around one cylinder, and the next succeeding folded signature to carry the leading end or ends of the web or webs partly around the other cylinder, and lower and upper deliveries for each cutting and folding cylinder, each delivery comprising an endless delivery carrier and a rotary delivery cylinder arranged to take the folded signatures from the cutting and folding cylinder and to transfer them to the endless delivery carrier.

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