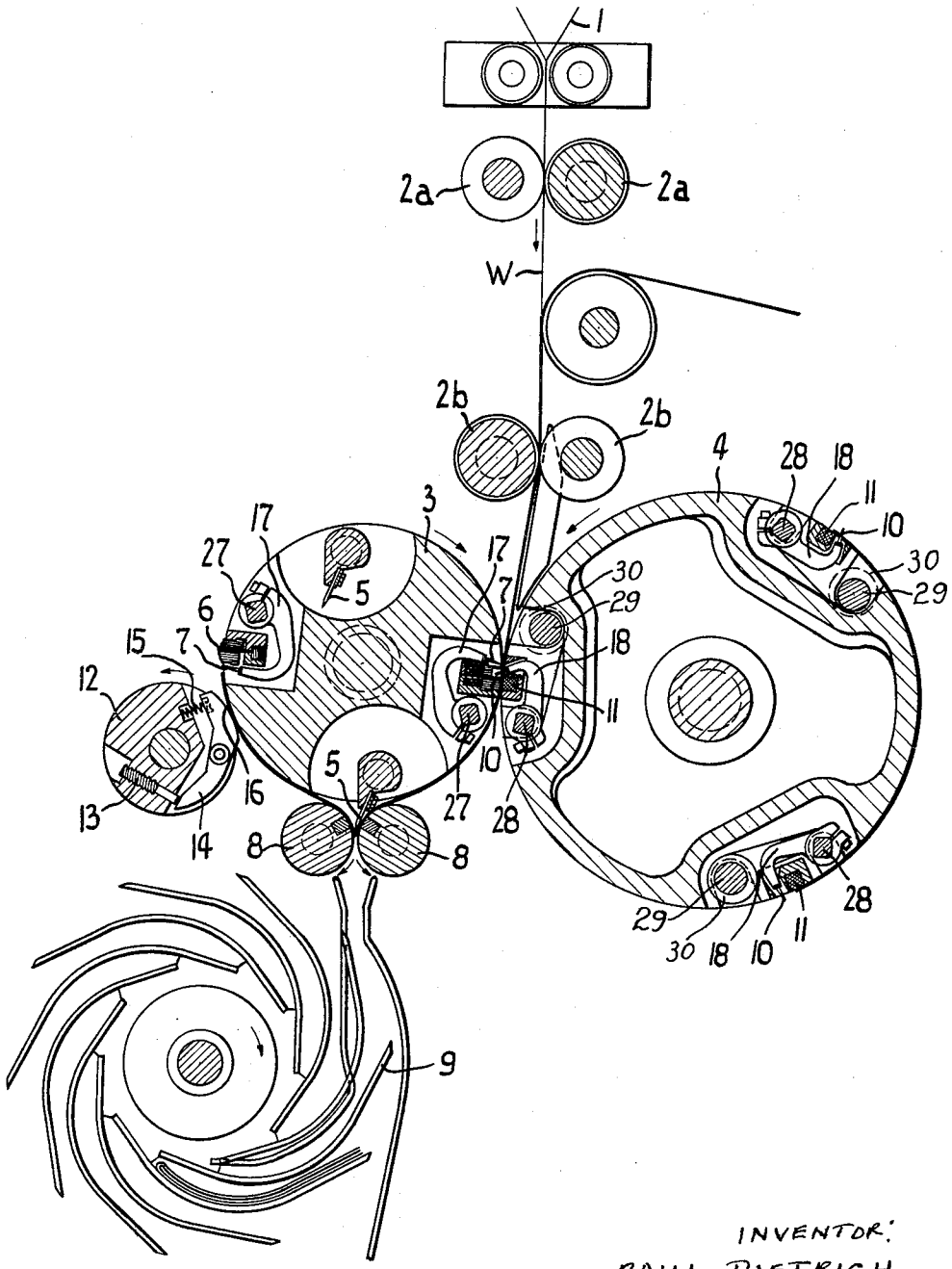
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APPARATUS FOR FOLDING AND COLLECTING IN ROTARY PRINTING PRESSES

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APPARATUS FOR FOLDING AND COLLECTING IN ROTARY PRINTING PRESSES

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This invention relates to folding apparatus for crosswise folding and collecting of signatures in rotary printing presses, particularly in newspaper printing presses.

Folding apparatus are known in which the folding blade cylinder has the same diameter as the plate cylinder of the rotary press, and in which the cutting cylinder, cooperating with said folding blade cylinder, and the collecting cylinder have a diameter which is one half of said folding blade cylinder.

However, with high speed of the presses, considerable centrifugal forces are experienced because of the small diameter of the collecting cylinder, which are very much prone to causing collected signatures to fly off the pins and to cause jamming in the folding apparatus. Furthermore the sharp curvature of the small collecting cylinder has an unfavorable effect in the same way with thicker products.

In another known folding apparatus the folding blade cylinder has a diameter which is one-and-one-half times the diameter of the plate cylinder of the rotary press and is used at the same time as collecting cylinder. The collected signature remains on the surface of the cylinder during the collecting process. Since the centrifugal forces become substantially smaller in this design because of the larger diameter, even under high speed conditions the danger of flying of collected products off the pins does not exist.

However, the shaft of the folding blade must be arranged eccentrically to the center line of the collecting cylinder in this design, so that the folding blades can not protrude over the periphery of the collecting cylinder which is covered by the collected signature. From the eccentric arrangement of these two axis a very complicated and expensive design results which frequently causes trouble.

It is intended by this invention to overcome these disadvantages.

The invention consists in the novel parts, construction arrangements, combinations and improvements herein shown and described.

Objects and advantages of the invention will be set forth in part hereafter and in part will be obvious herefrom or may be learned by practicing the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

It is the basic object of this invention to provide means contriving a simple and sturdy arrangement of the operating cylinders of the folding apparatus.

A further object of the invention is to provide means conducive to trouble-free folding and collecting at the highest printing press speed.

Furthermore it is an object of this invention to provide collecting cylinder means in a high-speed folding apparatus presenting a large curvature.

Another object of the invention is to provide means for holding the front edge of the signature to be folded in order to prevent overfolding of the signature at low speed of the printing press.

Various and more specific purposes, features and advantages will clearly appear from the detailed description given below taken in connection with the accompanying drawings which form part of this specification and illustrate merely by way of example one embodiment of the device of the invention.

In the following description and in the claims, parts will be identified by specific names for convenience, but such names are intended to be as generic in their application to similar parts as the art will permit. Like reference characters denote like parts in the several figures of the drawing, which shows in a schematic way a cross-section of the folding apparatus, presenting a preferred embodiment by which the invention may be realized.

Referring in more detail to the drawing, there is shown a paper web W coming down from a former folder **1**, pulled and guided by pairs of pinch rollers **2***a* and **2***b* to the cross-folding and collecting apparatus, comprising a cutting cylinder **3** and a collecting cylinder **4**.

In the cutting cylinder **3** which has the same diameter as the plate cylinder of the printing press, are located diametrically opposed to each other two rotating folding blades **5** and at a proper angle thereto two cutting knives **6**. Adjacent the cutting knives **6** are arranged two rows of paper pins **7** held in levers **17** fastened to shafts **27**, the movement of which is controlled in the well known, conventional way, not shown in the drawing. The rotating folding blades **5** are tucking the signatures between folding rollers **8**, wherefrom the folded products drop into the pockets of a fly delivery wheel **9**.

The collecting cylinder **4** which cooperates with the cutting cylinder **3**, has a diameter which is one-and-one-half times the diameter of the plate cylinder of the printing press, and which can carry three signatures on its periphery. To this extent the collecting cylinder has three rows of paper pins **10**, held in levers **18** fastened to shafts **28**, which can be rocked in the well known conventional way, not shown in the drawing, in order to hold and deliver the signatures to be collected. In order to prevent a double cutting of the tail end of the collected signature, the shafts **28** carrying the levers **18** with the paper pins **10** is periodically moved peripherally forward and backward by means of a second shaft **29** having eccentrics **30** thereon so that at the time of the cutting, every preceding collected signature is moved away from the knife. Adjacent to the rows of the paper pins **10** are arranged the cutting bars **11** into which the cutting knives penetrate during the cutting process. It would obviously make no difference to mount the cutting knives **6** in the collecting cylinder **4** and correspondingly the cutting bars **11** in the folding cylinder **3**.

Adjacent the cutting and folding cylinder **3** a brake roller **12** is provided having at least one cam-shaped lever **14** which can be adjusted by a screw rod **13** and which is resiliently held against said screw rod **13** by a spring **15**. The brake roller **12** is timed in such manner that the cam face **16** of the lever **14** holds the free tail ends of the signatures to be folded at low speed at the instant of folding.

While the invention has been described and illustrated with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the principle of the invention, that various other changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What I claim is:

1. In a folding apparatus for collecting and cross-folding signatures of a rotary printing press, the combination with a folding blade cylinder having two diametrically opposed rotating folding blades and two cutting knives arranged between said folding blades, of a collecting cylinder having three cutting bars spaced apart for cooperat-

ing with said knives, three rows of lever-mounted paper pins, said paper pins being arranged adjacent said bars, means for moving said levers carrying said paper pins periodically peripherally back and forth, said blades cooperating with a pair of folding rollers, a brake roller having cam-shaped levers resiliently mounted thereon, means in said brake roller for adjusting the position of said cam-shaped levers, said brake roller being located adjacent to said folding blade cylinder, and said cam-shaped levers cooperating with said folding blade cylinder in timed relationship.

2. In a rotary printing press, a folding apparatus comprising a combined cutting and folding cylinder having two rotary folding blades mounted diametrically opposed to each other therein and two cutting knives arranged between said folding blades, a collecting cylinder having three cutting bars equally spaced apart mounted thereon for cooperating with said knives, said collecting cylinder having three rows of paper pins arranged adjacent said cutting

bars, means for moving said rows of paper pins periodically peripherally back and forth in timed relationship with the operation of said collecting cylinder, a brake roller having at least one cam-shaped lever resiliently mounted thereon, means in said brake roller for adjusting the position of said lever, said brake roller being located adjacent to said combined cutting and folding cylinder, and said lever cooperating with said combined cutting and folding cylinder in timed relationship.

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