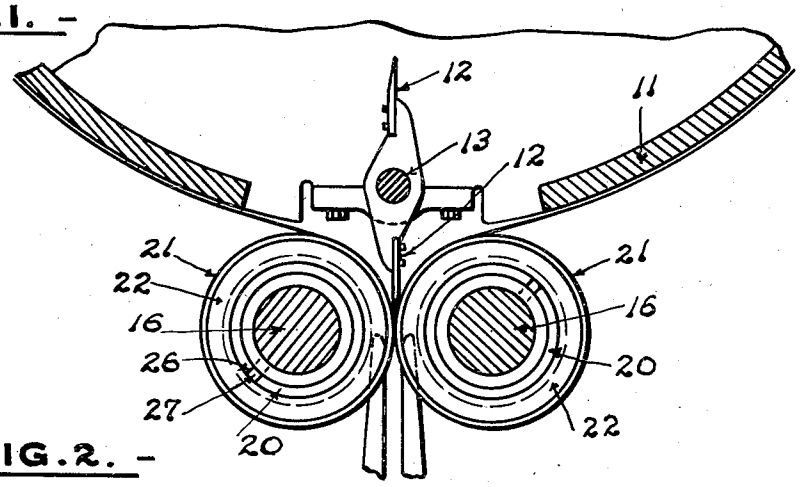
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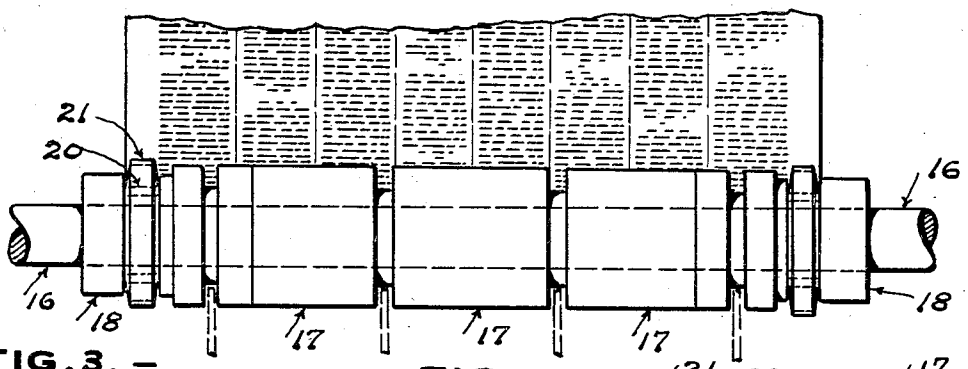
FOLDING ROLLER FOR PRINTING MACHINE FOLDERS

Filed June 5, 1933

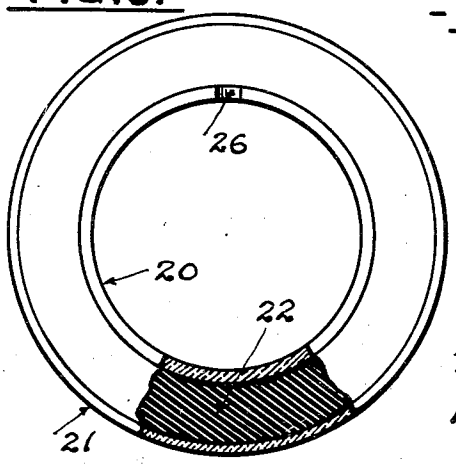
- FIG. 1. -



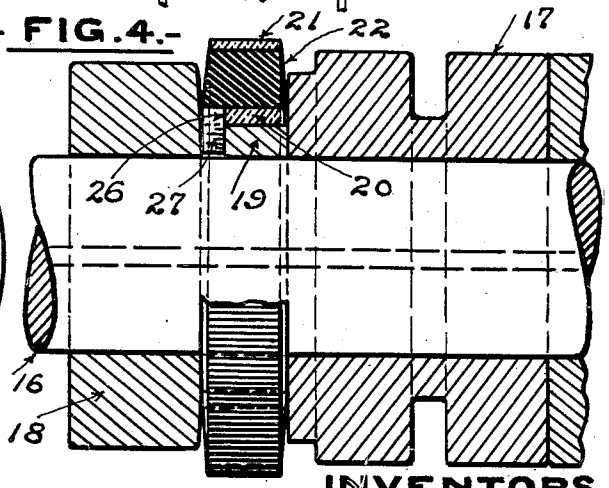
- FIG. 2. -



- FIG. 3. -



- FIG. 4. -



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FOLDING ROLLER FOR PRINTING MACHINE FOLDERS

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Application June 5, 1933, Serial No. 674,440

10 Claims. (Cl. 270—77)

This invention relates to improvements in folding roller or folding-off rollers for use in rotary printing machine folders.

In the operation of printing machine folders and particularly newspaper folders, "chokes" frequently occur at the folder owing to the failure of the folding rollers to fold off the product under certain operating conditions. This failure may be attributed to several causes, and among them is the breakage or loss of a web during the operation of the printing machine. When a web is broken the thickness of the product at the folding rollers is reduced, and inasmuch as the usual folding rollers are accurately adjusted to receive the full product this reduction in product thickness results in the failure of the rollers to fold off the product from the folding cylinder and consequently a severe choke occurs in the folder at the vicinity of the folding rollers. These chokes are sometimes so severe as to result in the breakage of the folding roller or cooperating components of the folder.

Referring to the practical operation of a newspaper folder it will be manifest that a sudden reduction in thickness of the web causes a choke. Suppose, for the sake of illustration, that the press is being run as a "sextuple". Under this condition the press may be producing a twenty-four page paper and the breakage of a web reduces the uninterrupted product to sixteen pages, causing a loss of thickness of one-third of the product. Obviously, the usual rigidly mounted folding rollers are adjusted to operably receive the complete product of twenty-four pages and the inadvertent reduction of the product to sixteen pages presents a product thickness which the folding roller cannot grip to properly fold-off and a damaging choke results.

Again, if the operator, through inexperience, negligence or other cause, fails to properly adjust the folding roller at the start of a "run" or in changing from a "straight run" to "collect run", or vice versa, this maladjustment also results in a failure of the folding roller to fold the product off the folding cylinder thereby causing a folder choke.

An object of this invention is to improve the constructing of the folding rollers so that they are provided with sections which yieldingly engage the product during the folding operation of the folder.

Another object of the invention is to provide folding rollers having sections of enlarged diameter and arranged to yieldingly engage the product during the folding operation of the folder.

A further object of the invention is the provision of means for applying auxiliary sections to the usual composite folding rollers, each auxiliary section being so constructed that it presents a hard outer surface to operably engage the product and this surface is held in yieldable engagement with the product during the folding operation by a resilient inner member.

It is also an object of the invention to provide a roller section for use on printing machine folding rollers of generally improved construction whereby the device will be simple, durable and inexpensive in construction as well as convenient, practical, serviceable and efficient in its use. With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of which is claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiments in the accompanying drawing, wherein:

Figure 1 is a fragmental vertical sectional view taken through a printing machine folder and showing the operative cooperation between the usual folding rollers, folding blade and folding cylinder,

Figure 2 is a fragmental elevational view depicting the operative association of the folding rollers with respect to the folding cylinder,

Figure 3 is a face view or elevation of the improved auxiliary folding roller section, parts appearing in section, and

Figure 4 is a transverse sectional view taken through the usual folding roller, showing the invention applied thereto.

Referring to the drawing, in which similar reference characters designate corresponding parts, there is shown a portion of a folding and collecting cylinder 11 which is provided with the usual rotary folding blades 12 pivotally secured, in the usual manner, to the cylinder 11, as indicated at 13. The folding blades 12 cooperate with the usual composite folding rollers, or folding-off rollers, each composite roller including the usual driven central shaft 16, intermediate roller sections or sleeves 17, and terminal sec-

tions or sleeves 18 mounted on said shaft. In the form of invention herein shown the terminal sleeves 18 are turned down or reduced in diameter to provide annular extensions 19 for the reception of the auxiliary folding roller sections forming the subject matter of this invention.

Each auxiliary folding roller section comprises a non-yielding or metallic inner member in the form of a ring or shell 20, and a similar non-yielding or metallic outer member 21, the inner and outer shells or members being secured to and united by an annular resilient member 22 formed of rubber or any suitable resilient material. The inner member 20 is provided with a notch or recess 26 for the reception of a screw or other securing device 27 which is threaded or otherwise secured to the extension 19 of the folding roller terminal section 18, thereby locking the auxiliary folding roller section against rotary motion relative to the folding roller terminal section 18.

The outer ring or member 21 of each auxiliary folding roller section is preferably of a diameter slightly larger than the diameter of the folding roller sections 17 and 18, and each auxiliary folding roller section is preferably located on the folding roller so that it engages the marginal space of the printed product.

In operation, the folding rollers are adjusted in the usual manner so that their peripheral portions firmly engage the product, and, when so adjusted, the outer rings or shells 21 of the auxiliary folding roller sections are pressed inwardly thereby positioning these rings eccentrically with relation to the folding roller shaft 16, and by tending, under the influence of the resilient material 22, to assume concentric positions, they exert yielding stress on the product. Thus it is obvious that any reasonable deviation in the thickness of the product will be compensated for by this novel construction.

Let us assume that the folder is operating under normal conditions and is folding the product in a "sextuple" run. While the press is running under normal conditions, the usual folding roller sections 17 and 18 will cooperate with the folding blades and product to properly fold off the product from the folding cylinder. However, if one of the webs is inadvertently broken, the thickness of the product reaching the folding rollers is reduced one-third and consequently the folding roller sections, which have been previously adjusted for a full product, will not have sufficient bite or grip on the product to fold it off the folding cylinders. The outer rings 21 of the auxiliary folding roller sections, however, are operating under stress tending to force them towards the product, and when the reduction in thickness of the product occurs, these rollers move towards each other and grip the product when the folding blade forces it between the folding rollers. Having gripped the product, the folding operation is completed, thereby avoiding a choke.

Applicants are aware that folders have heretofore been produced in which the folding rollers are stressed toward each other by springs. But, such construction would not serve the purpose of this invention, because the mass of the entire folding roller is such that its inertia would prevent it operating rapidly enough to grip the product at each folding impulse. However, with applicants' device the weight of the outer shell or member 21 is such that no inertia problem is presented, consequently the product would be practically instantaneously gripped at each folding operation of the folding blades.

Having thus described our invention, we claim:—

1. A folding roller for use in printing machine folders, having a section comprising an inner shell secured to the folding roller, an outer shell spaced from the inner shell and positioned concentrically thereto, and yieldable material interposed between the said shells and securely fastened to each shell to provide a composite yieldable annular member.

2. A folding roller for use in printing machine folders, having a section comprising an inner shell secured to the folding roller, an outer shell of greater diameter than the folding roller and positioned concentrically with relation to the inner shell, and yieldable material interposed between the said shells and securely fastened to each shell to operably support the outer shell.

3. A composite auxiliary roller section for use on the folding roller of a printing machine folder, the auxiliary section comprising an annular inner shell, a concentric annular outer shell, and yieldable material interposed between the inner and outer shells and securely fastened to each shell to operably support the outer shell.

4. A composite auxiliary roller section for use on the folding roller of a printing machine folder, the auxiliary section comprising an annular non-yieldable inner shell, a non-yieldable concentric annular outer shell, yieldable material concentrically interposed between the inner and outer shells and securely fastened to each shell to operably support the outer shell, the inner shell being secured to the folding roller and concentrically interposed between the folding roller and yieldable material.

5. A folding roller for use in printing machine folders, having separate non-yieldable sections and a composite annular yieldable auxiliary section operably supported on one of the roller sections and including non-yieldable inner and outer concentrically positioned shells and yieldable material concentrically interposed therebetween.

6. A folding roller for use in printing machine folders, having separate sections and a composite annular yieldable auxiliary section operably supported on one of the roller sections and having its diameter greater than the roller section, the yieldable auxiliary section including non-yieldable inner and outer concentrically positioned shells and yieldable material concentrically interposed therebetween.

7. A folding roller for use in printing machine folders, having separate sections, a composite auxiliary section operable on one of the roller sections, the auxiliary section comprising an inner shell secured to a roller section, a concentric outer shell, and yieldable material interposed between the inner and outer shells and securely fastened to each shell.

8. A composite auxiliary roller section for use on the folding rollers of a printing machine folder, the auxiliary section comprising an annular inner shell surrounding a portion of the folding roller and secured against rotation relative thereto, a concentric annular outer shell, yieldable material interposed between the inner and outer shells and securely fastened to each shell to operably support the outer shell.

9. A composite auxiliary roller section for use on the folding rollers of a printing machine folder, the auxiliary section comprising a relatively heavy annular inner shell secured to the folding roller, a relatively light concentric annular outer shell, yieldable material interposed between the inner

and outer shells and securely fastened to each shell to operably support the outer shell.

10. A composite auxiliary roller section for use on the folding rollers of a printing machine folder, the auxiliary section comprising a relatively thin annular inner shell of given axial length and secured to the folding roller, a relatively thin annular concentric outer shell of less axial length than the inner shell, yieldable material interposed between the inner and outer shells and securely fastened to each shell to operably support the outer shell.

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