July 4, 1961 P. DIETRICH 2,991,072

FOLDING GRIPPER CONTROL MEANS IN ROTARY PRINTING MACHINES

Filed Feb. 25, 1958 2 Sheets-Sheet 1

Fig. 1.

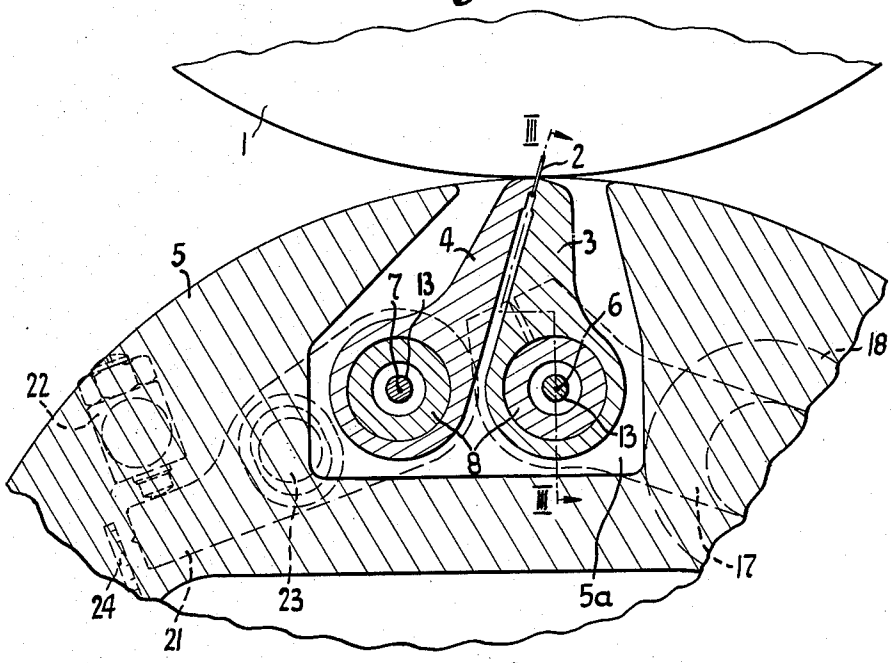
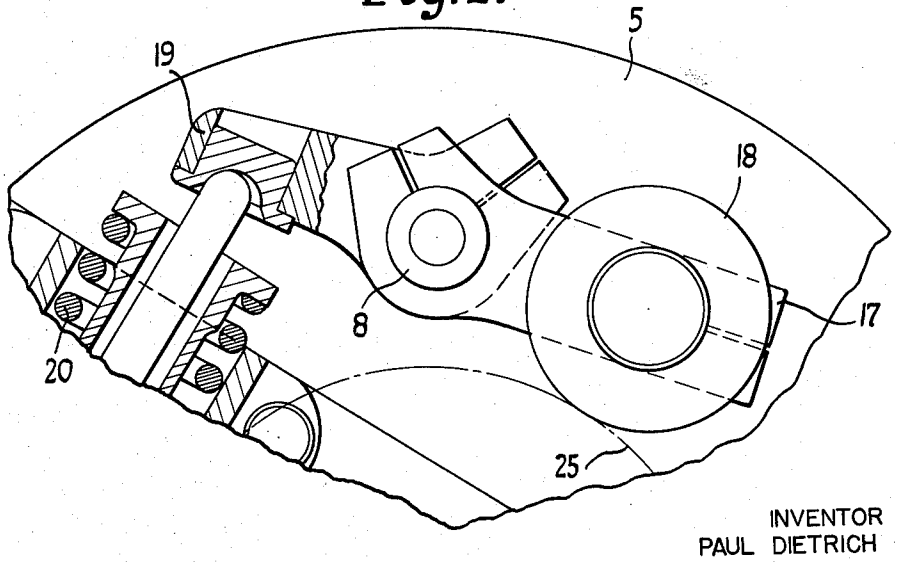


Fig. 2.



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Fig. 3.

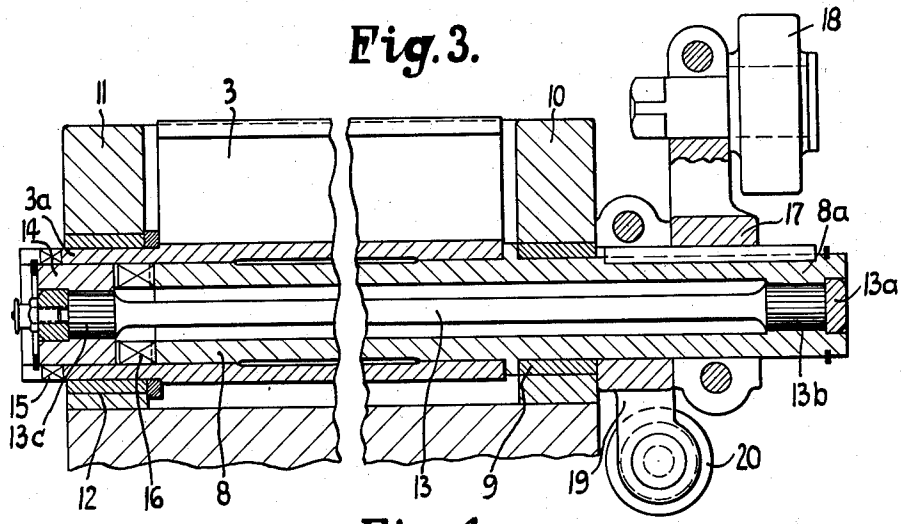


Fig. 4.

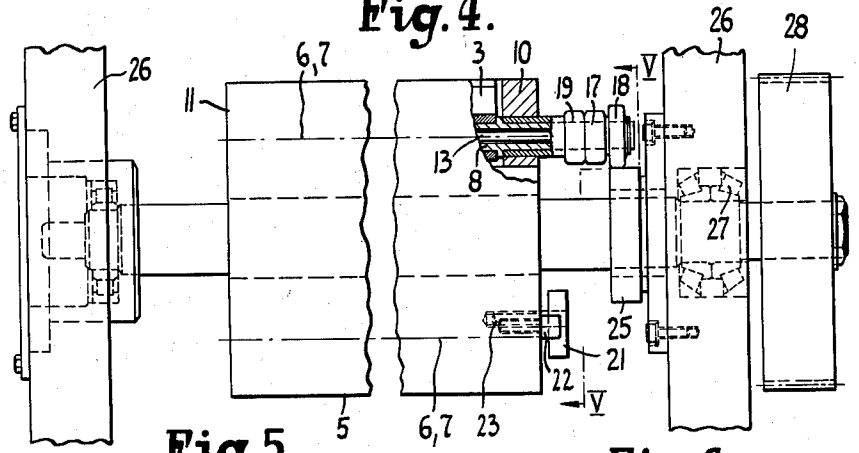


Fig. 5.

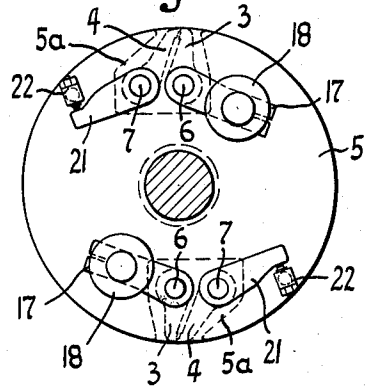
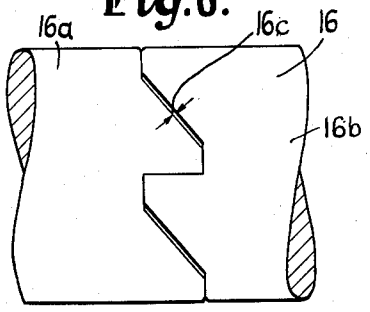


Fig. 6.



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FOLDING GRIPPER CONTROL MEANS IN ROTARY PRINTING MACHINES

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6 Claims. (Cl. 270—71)

The present invention relates to rotary printing machines. More in particular the present invention relates to adjusting means for the folding grippers in rotary printing machines.

It is known to devise control means for adjusting the folding grippers in rotary printing machines by moving back and forth in predetermined regular intervals a folding jaw and by providing another jaw as a spring plate. This device is, however, unsuitable for processing copies consisting of a great number of sheets as the introduction of the folding blade between the folding jaws will deform the spring plate and, as a result, an irregular fold will be produced.

It has also become known to construct a device in which one folding jaw is resiliently disposed on the folding cylinder, but this device can be used only for copies having a small number of sheets.

Still another folding device envisages a counter-current movement of the folding jaw and the counter jaw relative to one another. However, this construction is unsatisfactory because the moving counter jaw may result in a tearing of the point holes in the sheets passed between the jaws.

It is the object of the present invention to provide a control device for adjusting the folding grippers in rotary printing machines, which guarantees a regular fold irrespective of the number of sheets processed in one operation and without causing damage to the sheets.

This object is achieved by the device of the present invention according to which the folding jaw and the counter jaw do not bend even if comparatively thick copies are passed therebetween. Both jaws are rotatably mounted on support tubes and are equipped with resilient means allowing the jaws to yield to a predetermined extent without bending. Adjustable stop members are provided determining the extent to which the jaws are allowed to yield. It is, for example, possible to connect the jaws with their respective support tubes via a torsion bar and a claw coupling disposed in the interior of the support tube, with the one end of the torsion bar being fastened to the support tube and the other end being mounted at the folding jaw, means being provided at the latter location for readjusting the torsion bar.

The invention will be more fully appreciated upon the following description of the accompanying drawings, wherein

FIGURE 1 is a cross sectional partial view of the folding cylinder of a rotary printing machine receiving in an excavation the folding grippers, used in connection with the folding gripper control means of the present invention;

FIGURE 2 is a partial side view of the folding cylinder in a rotary printing machine, with some of the elements of the folding gripper control means of the present invention;

FIGURE 3 is a longitudinally sectional view of the folding gripper control means of the present invention, taken along lines III—III of FIGURE 1;

FIGURE 4 is an elevational view of the folding cylinder and its mounting in a rotary printing machine with the folding gripper control means of the present invention;

FIGURE 5 is a cross sectional view of the folding cylinder with the folding gripper control means of the present invention, taken along lines V—V of FIGURE 4;

FIGURE 6 is an elevational view of a portion of a claw coupling having a slight play between the coupling members used with the folding gripper control means of the present invention.

Referring now to the drawings somewhat more in detail, the folding blade **2** is disposed on the cylinder **1** in a manner known per se. The folding cylinder **5** is rotatably positioned in roller bearings **27** mounted on a support frame **26**. It is driven by a driving wheel **28** and bears the folding grippers consisting of the jaw **3** and the counter jaw **4** which extend over the entire length of the folding cylinder **5** and are positioned in an excavation **5***a* thereof. Both the jaw **3** and the counter jaw **4** are each rotatably mounted on a support tube. In the drawings, this is shown with regard to the jaw **3** rotatably mounted on the support tube **8**, which, in turn, is positioned in the bearing **9** of the first bearing cover **10** of the cylinder **5**. The jaw **3** is provided with a tubular elongation **3***a* which is rotatably positioned in a bearing **12** of the other bearing cover **11** of the cylinder **5**. The jaw **3** and, accordingly, the counter jaw **4** which is mounted in an entirely analogous manner, can thus be rotated about axes **6** and **7**, respectively.

Inside of the support tube there is provided a torsion bar **13** fixedly connected with one end **8***a* of the support tube **8** with its first end **13***b*, as at **13***a*. The other end of the torsion bar **13** firmly grips the inner wall of a sleeve **14** by means of a serration **13***c*. The sleeve **14** is connected with the tubular prolongation **3***a* of the jaw **3** through a claw coupling **15** and to the support tube through another claw coupling **16** having coupling members **16***a* and **16***b*. The claw coupling **16** is disposed between the sleeve **14** and the support tube **8** with a slight play as at **16***c* and simultaneously serves as a stop member for the jaw **3**.

Furthermore, the support tube **8** bears a lever **17** on which there is mounted the roll **18** driven by an eccentric **25**, and another lever **19** supporting a spring **20** holding roll **18** in position.

The counter jaw **4** is mounted in an entirely analogous manner and is provided with the corresponding elements. However, the support tube of the counter jaw **4** bears instead of the levers **17** and **19** a lever **21** resting against an adjusting screw **22** which simultaneously serves as a stop member. The lever **21** can be arrested by a locking screw **23**. By adjusting the screw **22** the play between the jaw **3** and the counter jaw **4** can be adjusted at will. A scale **24** is provided for controlling this adjustment.

The jaw **3** of the folding grippers is opened and closed relative to the resilient but otherwise stationary counter jaw **4** in predetermined intervals so as to allow for the introduction of the folding blade **2**. The jaw **3** is opened by means of the eccentric **25** fixedly mounted at the frame **26** and the roll **18** moving along the periphery of the eccentric **25**. The movement of the roll **18** is communicated to the jaw **3** via the lever **17**, the support tube **8**, the claw coupling **16**, the sleeve **14**, the claw coupling **15** and the tubular prolongation **3***a*. The spring **20** returns the jaw **3** to the closed position.

Resiliency is imparted to both the jaw **3** and the counter jaw **4** by the torsion bar inside of the support tube and therefore a satisfactory fold is obtained irrespective of the thickness of the copies passed between the jaws.

It will further be understood that this invention is susceptible to further modification and, accordingly, it is desired to comprehend such modifications within this

invention as may fall within the scope of the appended claims.

What I claim is:

1. In a rotary printing machine having means for folding paper sheets, a folding gripper control device comprising a bend-resistant jaw and a bend-resistant counter jaw, a pair of support tubes with said jaw and said counter jaw respectively being rotatably mounted on each one of said pair of support tubes but independently of each other, a stop member mounted on each of said support tubes to limit the movement of said jaw and counter jaw with respect to the respective support tubes, means for resiliently connecting said jaw and counter jaw to the respective support tubes, and means to periodically move said jaw with respect to said counter jaw while said counter jaw remains stationary.

2. In a rotary printing machine having means for folding paper sheets, a folding gripper control device comprising a bend-resistant jaw and a bend-resistant counter jaw, a pair of support tubes associated with said jaw and said counter jaw, respectively, a stop member mounted on said support tubes, a torsion bar and claw coupling means disposed in each of said support tubes, said jaw and said counter jaw being resiliently and rotatably mounted on said support tubes, said jaw and said counter jaw being connected with said respective support tubes via said torsion bar and said claw coupling but independently of each other, and means to periodically move said jaw with respect to said counter jaw while said counter jaw remains stationary.

3. In a rotary printing machine having means for folding paper sheets, a folding gripper control device comprising a bend-resistant jaw and a bend-resistant counter jaw, a pair of support tubes associated with said jaw and said counter jaw, respectively, a stop member mounted on said support tubes, a torsion bar and claw coupling means disposed in each of said support tubes, one end of said torsion bar being fixedly connected to said support tube, means for readjusting said one end of said torsion bar with respect to said support tube, the other end of said torsion bar being readjustably connected to said jaw, said jaw and said counter jaw being connected with said respective support tubes by said torsion bar and said claw coupling but independently of each other, and means to periodically move said jaw with respect to said counter jaw while said counter jaw remains stationary.

4. In a rotary printing machine having means for folding paper sheets, a folding gripper control device comprising a bend-resistant jaw and a bend-resistant counter jaw, a pair of support tubes associated with said jaw and said counter jaw, respectively, a stop member on said support tubes, a torsion bar disposed in each of said support tubes, said jaw having a tubular, elongated portion, a first claw coupling, a sleeve disposed within said tubular elongated portion and connected therewith via said first claw coupling, one end of said torsion bar being fixedly connected to said support tube, the other end of said torsion bar engaging said sleeve, a second claw coupling disposed with a slight play intermediate said sleeve and said support tube, said jaws being mounted independently of each other, and means to periodically move said jaw with respect to said counter jaw while said counter jaw remains stationary.

5. In a rotary printing machine, comprising means for folding paper sheets, a folding gripper control device as described in claim 1 with said moving means, comprising an eccentric roll and a lever mounted on said support tube and supporting said eccentric roll.

6. In a rotary printing machine, comprising means for folding paper sheets, a folding gripper control device as described in claim 1, comprising an adjustable screw disposed within the swivelling range of said counter jaw to limit the rotation thereof, thereby adjusting the play between said jaw and said counter jaw, and a scale associated with said counter jaw to indicate the range of rotation thereof.

References Cited in the file of this patent

UNITED STATES PATENTS

1,675,559	Jacobson	July 3, 1928
1,761,517	Christman	June 3, 1930
2,546,075	Meadowcroft	Mar. 20, 1951
2,599,776	Peyrebrune	June 10, 1952
2,732,798	Chase	Jan. 31, 1956