

[54] **APPARATUS FOR ANGULAR AND AXIAL REGULATION OF A PRINTING CYLINDER**

[75] Inventor: **Louis Bourbonnaud**, Nantes, France

[73] Assignee: **Societe Creusot-Hovie**, Paris, France

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[51] Int. Cl. **F16h 35/06, F16h 55/18**

[58] Field of Search..... **74/395, 409, 397**

[56] **References Cited**

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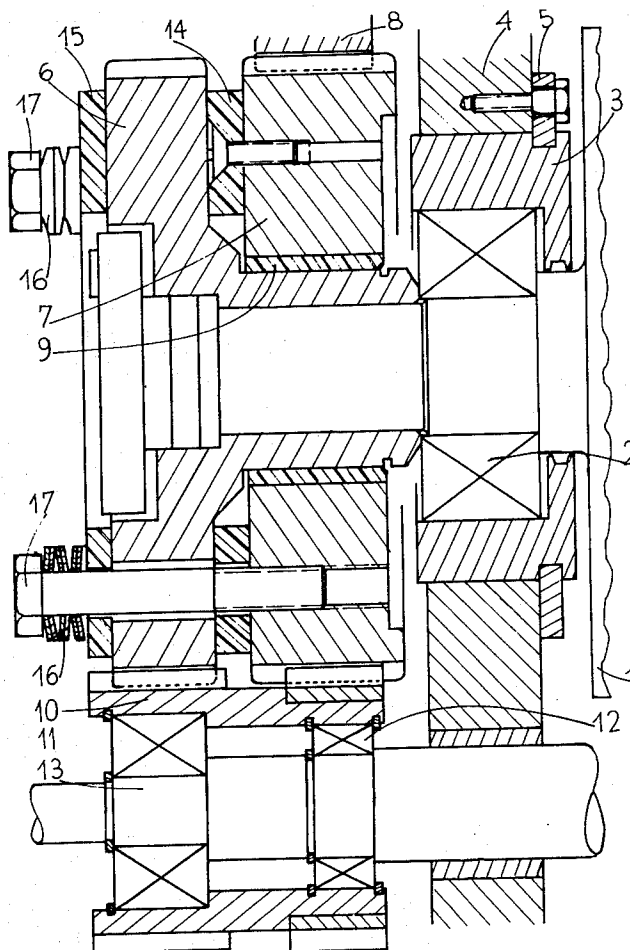
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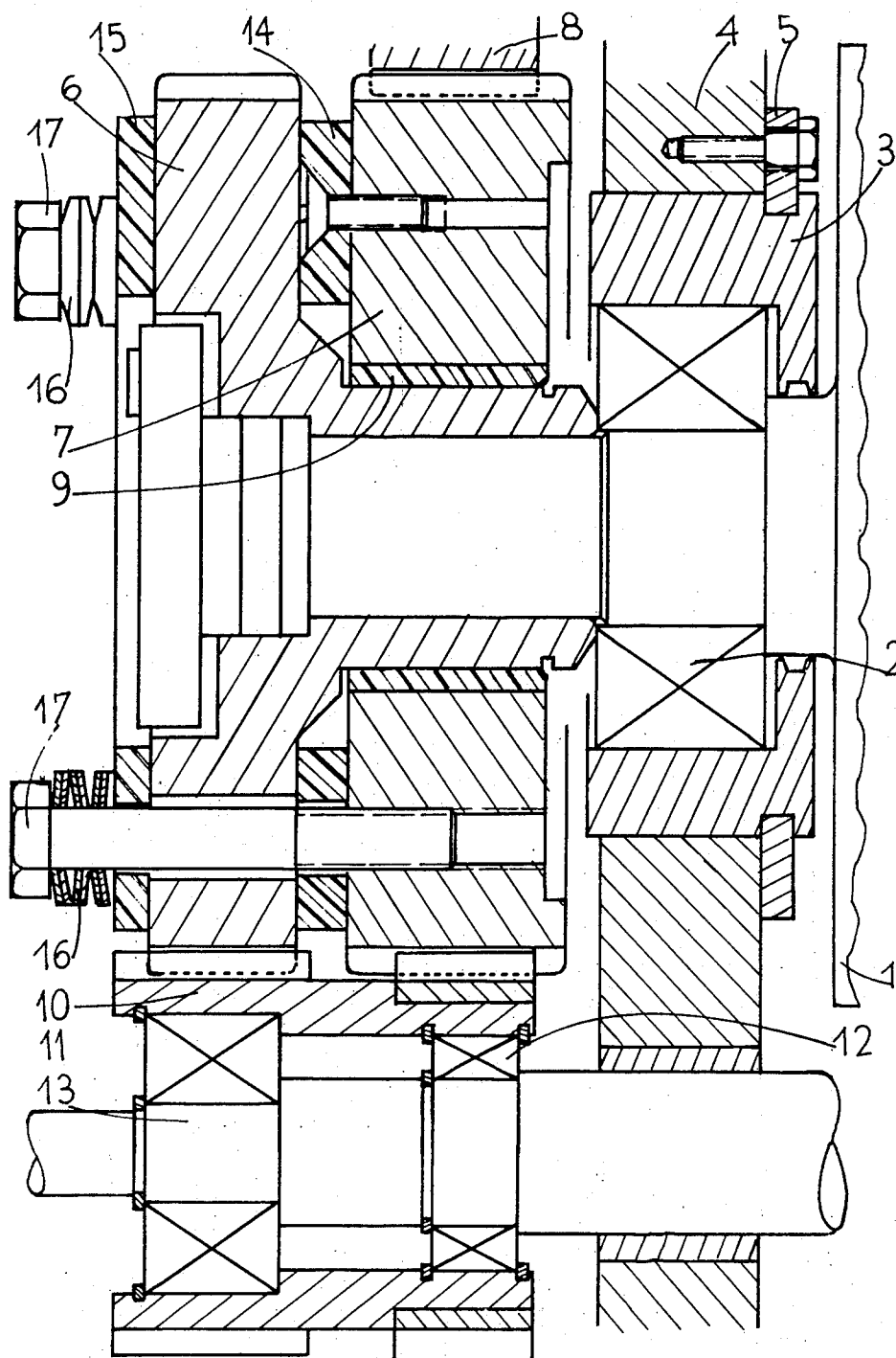
Primary Examiner—Leonard H. Gerin
Attorney, Agent, or Firm—Cameron, Kerkam, Sutton, Stowell & Stowell

[57] **ABSTRACT**

A device for the angular and axial setting of a printing machine cylinder which is axially displaceable by a control means comprises a pair of coaxial cylindrical pinions whose teeth are set at different angles, one pinion being solid with the cylinder and the other pinion being freely mounted relative thereto, engaged by a pinion assembly of the machine and coupled to the one pinion by a sliding friction coupling, the two pinions being engaged by a freely axially adjustable double pinion which provides an angular control and a link with the axial control.

5 Claims, 1 Drawing Figure





APPARATUS FOR ANGULAR AND AXIAL REGULATION OF A PRINTING CYLINDER

The present invention relates to a device for the angular and axial setting of a printing machine cylinder. 5

The object of the present invention is the perfection of a device for the angular and axial setting of the printing-plate holding cylinder of a printing machine.

The plate-holding cylinder of a multi-colour printing machine can have on the one hand a "margin setting" for transverse displacement in relation to the frame, and on the other hand a "register setting" for angular displacement, in relation to the general pinion assembly, in order to ensure that successive printings of each 15 of the colours are properly superimposed.

A device is known consisting of two cylindrical pinions with teeth set at different angles mounted on the spindle of the plate-holding cylinder which can be moved axially by a control, one pinion being solid with the cylinder while the other pinion is freely mounted on a geared spindle as part of the general pinion assembly of the machine, the two cooperating with a freely axially movable double pinion having the effect both of giving proper control and of forming a link with the cylinder axial control. This link permits adjustment of the margin setting without adjustment of the register setting, which could not be achieved with previously known devices. 20

The gearing mechanism operates with a tangential play between the flank of the double pinion and the flanks of the pinions mounted on the spindle. This play on the flanks, while in itself undesirable, is more or less necessary, due to inaccuracies in machining and machine installation, and to heating during operation.

This play in the gearing mechanism produces in the transmission between the free pinion and the double pinion and in the transmission between the double pinion and the pinion solid with the cylinder, occasional impression defects known as "doubling." This, in effect, means that due to this play the transfer of the impression onto the blanket cylinder is not always the same, the impression on the paper being sometimes "doubled" by the impressions due to the residues of ink from the preceding printing. 25

The aforesaid disadvantage is reduced by the device according to the present invention. In this device, as the machine operates, the possibility of an angular displacement corresponding to the gear play between the two pinions mounted on the spindle is overcome, the said device allowing, nevertheless, the possibility of relative displacement by altering the register setting control.

According to the invention, there is provided a device for the angular and axial setting of a printing machine cylinder which is axially displaceable by control means, the device comprising:

- a. two coaxial cylindrical pinions having teeth set at different angles, one of said pinions being solid with the cylinder and the other of said pinions being freely mounted relative thereto. 60
- b. a pinion assembly cooperating with said other cylindrical pinion,
- c. a freely axially adjustable double pinion cooperating with said two pinions and providing a control and a link with said axial control means, and 65
- d. a sliding coupling for coupling said two pinions.

Further features and advantages of the invention will become apparent from the following description of an embodiment thereof, given by way of example only, with reference to the accompanying drawing, in which the single FIGURE is a transverse cross-section through the axis of a printing cylinder.

The plate-holding cylinder 1 is rotatably guided by the bearings 2, the internal bearing rings being an integral part of the cylinder spindle.

The external bearing ring of the bearing 2, situated at the side of the driving gear chain represented partially by the pinion 8, is laterally free in a box 3 which is secured to frame 4 via a bearing ring 5 which is bolted to the frame. This axial freedom of the cylinder 1 permits control of the margin setting by means of a margin setting device, not shown, located on the opposite side. Two cylindrical pinions 6 and 7 are mounted on the cylinder spindle shown.

The pinion 6 is solid with the cylinder 1, the pinion 7 being mounted freely on the hub of the pinion 6 by means of a self-lubricating bearing ring 9. The cylindrical spur pinion 7 engages the general pinion assembly through the pinion 8 forming part of and engaging the double pinion 10, the said pinion being freely mounted and meshing by other means with the pinion 6, which has helical teeth. The double pinion 10 is freely rotatably mounted by means of the bearings 11 and 12 on a shaft 13 parallel with the cylinder and movable axially by a register setting control, not shown. 30

The drive between the spur pinion 7 and the helical pinion 6 is provided essentially by means of two friction rings 14 and 15. The ring 14 is positioned between the two pinions 6 and 7, pinion 7 being axially free in relation to pinion 6.

The ring 14 is solid with the pinion 7 and is compressed between the said pinion 7 and the pinion 6 by means of springs 16 held by bolts 17 screwed into the pinion 7. A friction ring 15 is held by the bolts 17 to rotate with the pinion 7 and is urged by the springs 16 against the pinion 6. This coupling permits relative rotation between the pinions 6 and 7 as soon as the angular force provided by the axial adjustment of the double pinion 10 has exceeded the value of limiting friction. 35

The friction of force coupling the pinions 6 and 7 to each other can be regulated by adjusting the bolts 17 which compress the coil springs 16 to a greater or smaller extent.

The invention is not strictly limited solely to the embodiment described in the example, but also covers other similar embodiments, differing only in minor details. 40

What is claimed is:

1. A device for the angular and axial setting of a printing machine cylinder which is axially displaceable by control means, the device comprising:

- a. two coaxial cylindrical pinions having teeth set at different angles, one of said pinions being solid with the cylinder and the other of said pinions being freely mounted relative thereto,
 - b. a pinion assembly cooperating with said other cylindrical pinion,
 - c. a freely axially adjustable double pinion cooperating with said two pinions and providing a control and a link with said axial control means, and
 - d. a sliding coupling for coupling said two pinions. 45
2. The angular and axial setting device as claimed in claim 1, wherein the sliding coupling comprises at least

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one friction ring compressed between and acting against said two pinions by means of a member exerting an axial force.

3. The angular and axial setting device as claimed in claim 2, wherein said other pinion is axially free, and said two pinions are bolted to said friction ring. 5

4. The angular and axial setting device as claimed in claim 1, wherein the sliding coupling comprises at least

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one friction ring rotatable with one of said two pinions and applied against the other of said two pinions by at least one spring exerting an axial force.

5. The angular and axial setting device as claimed in claim 4, wherein the compressive force exerted by said spring is adjustable.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,793,899 Dated February 26, 1974

Inventor(s) Louis Bourbonnaud

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

--[30] Foreign Application Priority Data
September 24, 1971 France 7134373--

Signed and sealed this 10th day of September 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents