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ROTARY SADDLE FOR A PAPER CUTTING MACHINE

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Fig.3.

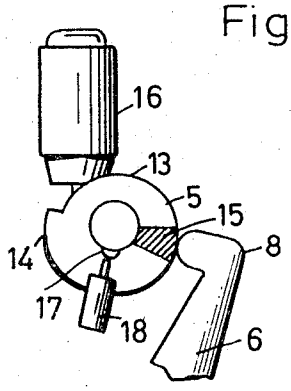
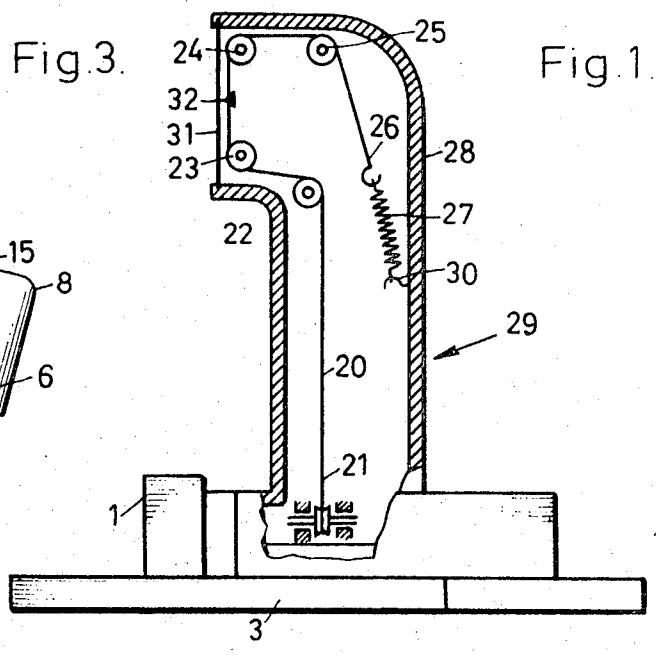


Fig.1.



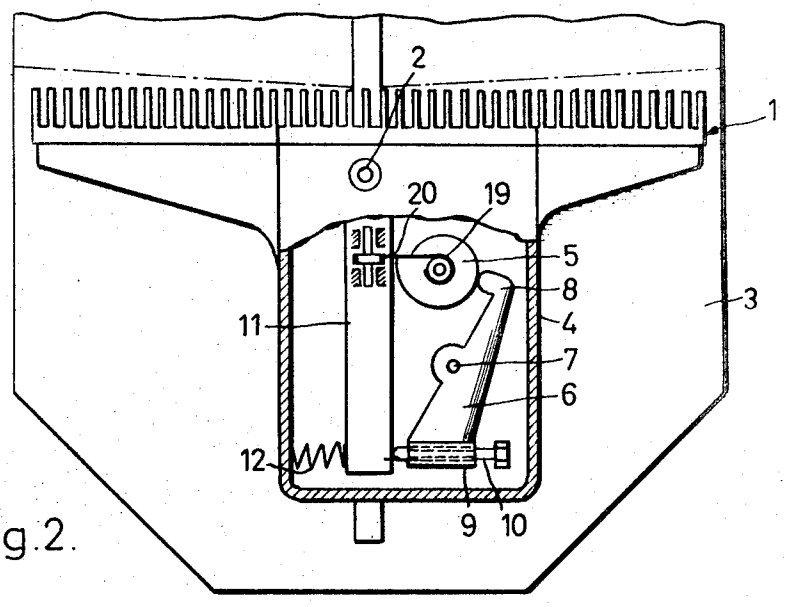


Fig.2.

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ROTARY SADDLE FOR A PAPER CUTTING MACHINE

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ABSTRACT OF THE DISCLOSURE

A rotary saddle which can be controlled electro-mechanically from the operator's side of a paper cutting machine in which rotation of the saddle is effected by a rocking lever which is controlled by a cam disc, one end of the rocking lever bearing on the cam disc while its other end cooperates with a rib of the rotary saddle by means of an adjusting screw.

BRIEF SUMMARY OF THE INVENTION

The invention relates to a rotary saddle for paper cutting machines which serves to bring material which has become warped mainly by influences during printing or by moisture, into a correct position relative to a printed image for a cutting operation.

In order to perform this task, it is known to rotate the feed saddle of the cutting machine in the plane of the table about a vertical axis. This rotational movement has heretofore been carried out manually by the adjustment of appropriate screws, or it has been effected by means of an electrically driven screw threaded spindle. Control is effected from the operator's side of the machine, and the particular angular position of the saddle can be read from a meter.

These known constructional arrangements for the adjustment of the feed saddle have the disadvantage that in the first-mentioned constructional form the operator has to walk from the operator's side of the machine to the rear end of the table in order to carry out thereat the precise manual setting of the saddle.

This advantage has already been obviated by allowing the adjustment of the saddle to be effected from the operator's side by electro-mechanical means in one known construction. But in this improved constructional form also, there is the disadvantage that the operator must adjust the zero position of the saddle, i.e. the position wherein the feed saddle is aligned parallel to the cutting knife, by actuation of a switch, and the switch must be held closed until the zero position is read on the meter. This means that the operator has to supervise not only the scale for the amount of cutting, but also the scale, i.e. the meter, for the angular setting of the feed saddle. Since these scales are separated from one another, there is a risk, for example, that the meter will not be brought into the zero position after a cut is carried out, so that incorrect cuts will be executed when a new cutting operation is initiated.

In order to obviate these disadvantages of the known constructional forms provided for the adjustment of the rotary saddle in paper cutting machines, it is an object of the invention to develop and arrange constructionally the rotary saddle in a paper cutting machine in such a manner as to permit play-free rotation of the saddle and therefore precise adjustment, to permit adjustment to be effected along short working travels, and to permit automatic return of the rotary saddle from an angular adjusted position into the zero position, all movements of the rotary saddle being adapted to be read-off a common scale for the cutting marking and the angular setting of the rotary saddle.

According to the invention, this is achieved for a rotary saddle to be controlled from the operator's side of the paper cutting machine in that the rotation of the saddle is effected by means of a rocking lever which is controlled by a cam disc and one end of which bears on the cam disc and whose other end cooperates with the rotary saddle to rotate the same. The cam disc and rocking lever are connected fast to the housing of the rotary saddle for movement therewith. The cam disc has a sector of a circle for automatic adjustment of the saddle to the zero position. When the rocking lever reaches the arc over which this sector extends, the saddle is pivoted into the zero position. The arc is of a constant curvature, and thereby the rocking lever no longer moves in this region, so that the zero position setting of the saddle is independent of the precise stop of the cam disc.

The movement of the rotary saddle is made perceptible by an indicating device which comprises a cable system which is connected operatively to the cam disc and which by means of an indicating mark indicates the angular postion on an appropriate scale of the reading device.

The automatic adjustment of the rotary saddle into the zero position is effected by means of a limit switch which is operated when the rocking lever comes into the region of the aforesaid arc on the cam disc.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a side view of a rotary saddle with an indicating device partly broken away;

FIG. 2 is a plan view of the rotary saddle partly broken away; and

FIG. 3 shows the control elements in plan view on an enlarged scale.

DETAILED DESCRIPTION

As seen in FIGS. 1 and 2, a rotary saddle **1** is supported for angular movement about a vertical axis **2** in the plane of the machine table **3**. This arrangement is conventional. Situated in a fixed saddle housing **4** are a cam disc **5** and a rocking lever **6**. The rocking lever **6** is mounted for pivotable movement about a pivot pin **7**, and an end **8** of the rocking lever abuts the cam disc **5** while the opposite end **9** accommodates an adjusting screw **10** which bears on a rib **11** of the rotary saddle **1**. On the side of the rib **11** opposite the adjusting screw **10** there is arranged a coil spring **12**, one end of which bears on the housing **4**, whereas its other end presses against the rib **11**. Thus the rib **11** always bears against the adjusting screw **10** of the rocking lever **6** and the end **8** of the rocking lever is urged against the cam disc **5**. With the above arrangement, the saddle **1** rotates about the axis **2** in accordance with the rotation of the cam disc **5**, and the saddle assumes an angular position which corresponds to the particular curvature of the cam disc **5**.

As FIG. 3 shows, the cam disc **5** has three different curvature regions, namely the regions **13** and **14** of varying curvature and the region **15** which has a constant curvature extending over a sector covering about 30°. In this region the rotary saddle is in a zero position, i.e. a position in which it is aligned parallel to the cutting knife.

The cam disc **5** is driven by means of a geared motor **16**, and preferably the gearing is constructed as a worm gearing. Arranged on the cam disc is a switching cam element **17** which, as shown in FIG. 3, comes into engagement with a limit switch **18** when the end **8** of the rocking lever **6** comes into the region of the sector, and then stops the driving motor. This arrangement automatically locates the

rotary saddle in the zero position. Thus, if the motor **16** is energized when the saddle is in an adjusted position, as for example, after a cutting operation, the saddle will automatically return to its zero position. The activation of the motor **16** for the adjustment of the saddle into the desired angular position is then effected in known manner by means of a switch or the like arranged at the operator's side of the machine.

Connected to the cam disc **5** is a cable pulley **19** which accommodates a cable **20** which is guided over pulleys **21, 22, 23, 24, 25**, and whose end **26** is fixed to a spring **27**. The spring **27** is fixedly arranged in the housing **28** of an optical measurement indicating device **29**, at a hook **30**.

In the region of a ground-glass plate **31** of the optical measurement indicating device **29**, the cable **20** is provided with an indicator **32** which indicates each angular position of the cutting saddle in continuous succession on an appropriate scale.

In addition to automatic adjustment of the saddle to the zero position, the desired angular position can also be achieved automatically. This adjustment can be effected, for example, by providing the material to be cut at its edges with cutting marks such as are used in offset printing, scanning these cutting marks photo-electrically and rotating the saddle until opposite marks are in alignment. In this position, the driving motor is then switched off, so that the saddle is then in precisely the correct position relative to the printed image. When the cutting operation for a pile has been carried out, the saddle is returned in known manner into the end position. When the end position is reached, a limit switch (not shown) can be operated which activates the motor **16** so that the cam disc rotates until the cam element **17** contacts the limit switch **18**, which then deenergizes the motor **16**. Then, at deenergization, owing to the position of the cam element **17** on the cam disc **5**, the end **8** of the rocking lever **6** controlling the saddle **1** reaches the arc in the region of the sector **15** and thus brings the saddle to the zero position shown in FIG. 2.

Thus, with the apparatus according to the invention, it is posisble to rotate the saddle into the correct position relatively to the printed image in a completely automatic manner and, when the cutting sequence has been carried out, to shift the feed saddle to zero position when the end position is reached and before a new paper pile is introduced.

What is claimed is:

1. For a paper cutting machine, the combination of a rotary saddle, a cam supported for rotation about an axis, means acting on said saddle and in contact with the cam for rotating the saddle in response to angular movement of the cam, said saddle having a zero position and being rotatable from said zero position to angularly adjusted positions, and means associated with said cam for halting the cam, after the cam is angularly rotated from an adjusted position, in a position in which the saddle is in the zero position.

2. The combination as claimed in claim **1** wherein said saddle includes a rib, said means for rotating the saddle in response to angular movement of the cam comprising a rocking lever bearing on the cam and rib.

3. The combination as claimed in claim **2** wherein said rocking lever includes an adjusting screw which bears against said rib.

4. The combination as claimed in claim **2** comprising a housing for said rotary saddle, said disc and rocking lever being rotatably connected to said housing.

5. The combination as claimed in claim **2** wherein said cam has a limited surface region of constant curvature in which the rocking lever maintains the saddle in zero position, and two regions with varying curvature extending in opposite directions from the region of constant curvature.

6. The combination as claimed in claim **5** comprising a motor for driving the cam, said means for halting the cam comprising a limit switch for the motor and a cam element on the cam for operating the switch to deenergize the motor as the rocking lever enters the region of constant curvature of the cam.

7. The combination as claimed in claim **1** comprising a cable pulley coaxially mounted on the cam, and a cable having one end connected to the cable pulley and a resiliently supported opposite end.

8. The combination as claimed in claim **7** comprising an indicator device for optical measurement of the position of the saddle, said cable including an indicator which is visible in said indicator device.

9. The combination as claimed in claim **8** wherein said indicator device includes a ground glass plate, the indicator on said cable passing adjacent said ground glass plate.

10. The combination as claimed in claim **5** comprising photo-electric scanning elements for scanning visible marks on the material to be cut and for controlling the angular position of the cam disc in either direction from the zero position until the marks are aligned with scanning elements.

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JAMES M. MEISTER, Primary Examiner

U.S. Cl. X.R.

83—367, 467; 269—304, 320