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(54) Blade supporting device for inking units in printing presses

(57) A doctor blade supporting device for inking systems in printing presses, comprising an inking or anilox cylinder, which is combined with a doctor blade (17) to remove excess ink on said drum, the supporting device consisting of an arm (6) mounted to project in an rocking manner around a pivot (9) and having at its free end an equalizing bar (35) bearing horizontal pivots (36), onto which the doctor blade (17) is hooked, so that it can rock around the horizontal axis of said pivots (36), the bar (35) being articulated on a pivot (33) with a vertical axis (36), so that said doctor blade (17) can also rock around the vertical axis of said pivot (33).

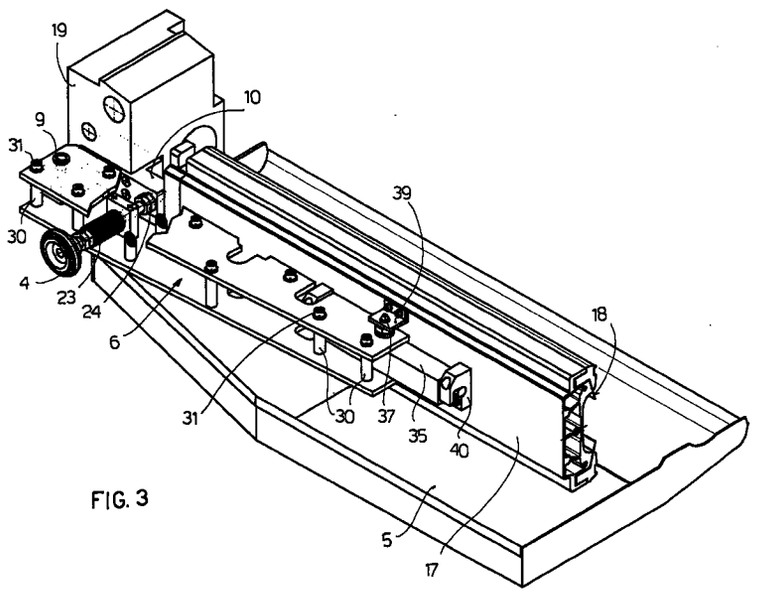

FIG. 3

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Description

The present invention relates to a doctor blade supporting device for inking systems in printing presses, particularly for flexographic printing.

As is known, a flexographic printing press, as described for example in European patent application No. 96101324.0, basically comprises a drum with a considerable diameter, around which is wound the sheet material to be printed, which is fed from a supply reel and rewound onto a take-up reel after printing.

Depending upon the pattern to be printed on the sheet material, that is, according to the number of colours to be transferred onto it, a plurality of inking systems is arranged along the edge of said drum, each comprising an inking or "anilox" cylinder that draws the ink from a special tank, by means of suitable openings or cells in its shell and transfers it to a printing cylinder proper, or stereotype bearing cylinder, which carries out printing on the sheet material.

Each inking or anilox cylinder is combined with a doctor blade, which serves to remove excess ink from the cylinder. The doctor blade must be pressed evenly against the surface of the anilox cylinder to ensure good printing results.

According to the prior art, the doctor blades are supported at each end by the sides of the press.

This type of mounting, which allows the doctor blade a to and fro movement with respect to the anilox cylinder and a rocking movement around the horizontal supporting axis, has various problems and drawbacks.

Firstly, it does not ensure that the doctor blade adheres evenly to the anilox cylinder, and can cause the occurrence of differential pressures on the cylinder, if the regulations, which must be made at both ends of the doctor blade, are not precise.

Moreover, these regulations must be carried out with the press shut, since it is not possible to adjust the regulating means if the mobile shoulders provided for example in the above mentioned European patent application No. 96101324.0 are open, a possibility which would be useful in many cases.

Another drawback of known doctor blade supporting devices is that they require long and laborious operations for removal of the doctor blade, since the corresponding mobile shoulder of the press, when present, must first be opened, or in any case the two lateral doctor blade fixing assemblies must be released.

Moreover, in presses with a mobile shoulder, it is often necessary to carry out operations with the machine open and running. In this case, the slight rocking during rotation of the anilox cylinder which continues to be supported on only one side, are not compensated for by the doctor blade, which is also supported on only one side, therefore problems can occur, such as ink loss/leakage and the like.

These problems and drawbacks are felt all the more if it is considered that in a printing press a film pressure drum is combined with a number inking systems, up to eight or more, and therefore with the same number of doctor blades.

The aim of the invention is to eliminate the above drawbacks and in particular to provide a doctor blade supporting device that ensures that the pressure of the doctor blade against the corresponding anilox cylinder is evenly distributed.

Another purpose of the invention is to provide such a supporting device that allows the pressure of the doctor blade to be regulated simply and precisely.

Yet another aim of the invention is to provide a supporting device that allows simple and rapid removal of the doctor blade.

These aims are achieved, according to the invention, with the characteristics listed in appended claim 1.

Preferred embodiments of the invention emerge from the dependent claims.

Basically, the supporting device according to the invention allows the doctor blade a greater degree of freedom than the devices of the prior art. In particular, the device according to the invention, besides a to and fro movement of the anilox cylinder and a rocking movement around a horizontal axis, also allows the doctor blade a rocking movement around a median axis perpendicular to the previous one.

The supporting device according to the invention comprises a rocking arm mounted in a projecting manner, at the free end of which there is an equalizing bar having two horizontal end pivots to support the doctor blade, and itself engaged with a central pivot at right angles to said end pivots.

In this way, the doctor blade can rock around a horizontal axis joining said end pivots and, together with the equalizing bar, around the pivot axis of the bar itself.

The pressure of the doctor blade against the corresponding anilox cylinder is adjusted by means of a special hand wheel which acts on a screw to increase or decrease the compression of a spring which pushes said arm against a corresponding fixed support.

To remove the doctor blade it is sufficient to completely unscrew the regulating screw so as to be able to open the supporting arm of the doctor blade, making it rotate around the respective suspension pivot, thus gaining free access to the doctor blade.

Further characteristics of the invention will be made clearer by the detailed description that follows, referring to a purely exemplary and therefore non-limiting embodiment thereof, illustrated in the appended drawings in which:

Figure 1 is a partial plan view, with some parts in section, of a doctor blade with a supporting device according to the invention, combined with a corresponding inking or anilox cylinder;

Figure 2 is a cross-section taken along the line II-II of Figure 1, showing the doctor blade alone with its supporting device;

Figure 3 is an axonometric view of a doctor blade and the relative supporting device, mounted in the opposite way to that shown in Figure 1;

Figure 4 is an exploded view of the doctor blade and supporting device shown in Figure 3.

Figure 1 shows an inking or anilox cylinder 1 of a printing press, of which only the right side 2 is shown, in which is inserted a sliding block 19 with a hole 20 for the support of the axle 21 of the cylinder 1, which is set in rotation by external means which are not shown.

The cylinder 1, in a per se known manner, has openings or cells on its outer surface and picks up ink from a tank 5 beneath, transferring it to the respective printing cylinder (not shown), bearing the stereotype corresponding to the pattern to be printed, which in turn transfers the colour to the film.

The anilox cylinder 1 is combined with a respective doctor blade 17, with a pair of blades 18 facing each other that scrape the excess ink from the cylinder 1.

The doctor blade 17, according to the invention, is supported by an arm 6 mounted in a projecting manner so that it rocks around a pivot 9, integral with a supporting block 10, in turn fixed by means of screws 11 in a seat 12 (see particularly Figure 4) of the carriage 19.

The arm 6, bearing the doctor blade 17, is locked in place, or rather prevented from opening as it rotates around the pivot 9, by a screw 13, operated by an external hand wheel 4, and engaging in the support block 10. The pressure exerted by the arm 6 and therefore of the doctor blade 17 against the cylinder 1 can be regulated by turning the hand wheel 4, to increase or decrease the pressure exerted by a spring 23 acting on a plate 24 integral with the arm 6.

The arm 6 consists of two crosspieces facing each other, an upper one 7 and a lower one 8, between which are interposed spacers 30 fixed from the outside by means of screws 31.

Near the free end of the arm 6, between the pair of crosspieces 7, 8 an equalizing bar 35 having two end pivots 36 lying on the same horizontal axis is mounted to rock around a pivot 33 perpendicular to said crosspieces 7, 8.

The pivot 33 around which the bar 35 rocks, which is at right angles to the axis of said end pivots 36, will henceforth also be called vertical axis, although this term is not exact, since its orientation depends upon the position the inking unit of the anilox cylinder 1 occupies around the pressure drum of the printing press.

The pivot 33 of the bar 35 has at the top a conical head 37 designed to fit, with a certain amount of play, inside a hole 38 in an L-shaped bracket 39, fixed to the body of the doctor blade 17.

The doctor blade 17 also bears a pair of hook-shaped supports 49, opening downwards, which engage with said end pivots 36 of the bar 35.

On the bottom part of the bar 35 is also fixed a leaf spring 41 which acts at the back of the body of the doctor blade 17 (Figure 3) for balancing thereof.

The structure described above allows the doctor blade 17 to be mounted extremely simply and rapidly. It is sufficient, in fact, to hook the two supports 40 provided at the back of the doctor blade 17 to the corresponding end pivots 36 of the bar 35, so that the hole 38 of the bracket 39 engages the conical head 37 of the pivot 33 on which the bar 35 rocks. This operation is carried out with the arm 6 open, that is turned outwards around the relative suspension pivot 9. To do this it is sufficient to unscrew the screw 13 completely from the supporting block 10 by turning the hand wheel 4.

In the mounted position, as stated previously, the contact pressure between the doctor blade and the cylinder 1 can be regulated by adjusting the hand wheel 4, the pressure being distributed evenly along the whole length of the doctor blade, thanks to the fact that the doctor blade can rock around the vertical pivot 33 of the supporting bar 35.

The doctor blade 17 can also rock around the horizontal axis of the pivots 36, to which it is simply hooked by means of hook-shaped supports 40. This rocking is made possible by the play existing between the head 37 of the pivot 33 and the hole 38 in the plate 39.

According to the invention, therefore, the doctor blade 17 can be moved closer to or further from the cylinder 1, by means of the movement of the arm 16, acting in particular on the regulating hand wheel 4; it can rock around a horizontal axis, i.e. around the axis of the doctor blade supporting pivots 36; and it can rock around a vertical axis, i.e. around the axis of the pivot 33 of the equalizing bar 35.

The invention therefore fulfills the established aims.

Claims

1. A supporting device for the doctor blade (17) of inking systems on printing presses comprising an anilox cylinder (1) against which the doctor blade (17) is pressed, characterized in that it comprises an arm (6) mounted in a projecting manner so that it can rock around a pivot (9), said arm (6) supporting, near its free end, the central part of said doctor blade (17) so that it can rock not only around a horizontal axis but also around a vertical axis, or in any case an axis perpendicular to said horizontal rocking axis.

2. A device according to claim 1, characterized in that said arm (6) carries an equalizing bar (35) with horizontal end pivots (36) to support the doctor blade (17) so that it can rock around the axis of said pivots of the doctor blade (17), said bar (35) in turn rocking around a pivot (33), which constitutes the vertical rocking axis of the doctor blade (17).

3. A device according to claim 2, characterized in that said doctor blade (17) has on its back a pair of hook-shaped supports (40) opening downwards,

for engagement of said end pivots (36) of the bar (35) and a bracket (39) with a horizontal hole (38) housing, with some play, the conical head (37) of said pivot (33) of the bar (35).

4. A device according to claim 2 or 3, characterized in that said bar (35) bears at its bottom a leaf spring (41) acting against the rear part of said doctor blade (17) for balancing thereof.

5. A device according to any one of the preceding claims, characterized in that said pivot (9) around which said doctor blade supporting arm (6) rocks is integral with a supporting block (10) fixed to a carriage (19) supporting the anilox cylinder (1).

6. A device according to claim 5, characterized in that it provides a means of regulating the pressure of said doctor blade (17) against said anilox cylinder (1), acting between said arm (6) and said arm supporting block (10).

7. A device according to claim 6 characterized in that said pressure adjusting means is a screw (13) screwing into said supporting block (10) which can be controlled by means of an external hand wheel (4), which, when turned in one direction or the other, causes a greater or lesser compression of a spring (23) acting against said arm (6).

8. A device according to any one of the preceding claims, characterized in that said arm (6) comprises an upper cross-piece (7) and a lower cross-piece (8) joined by spacers (30) and fixed by means of screws (31) on the outside.

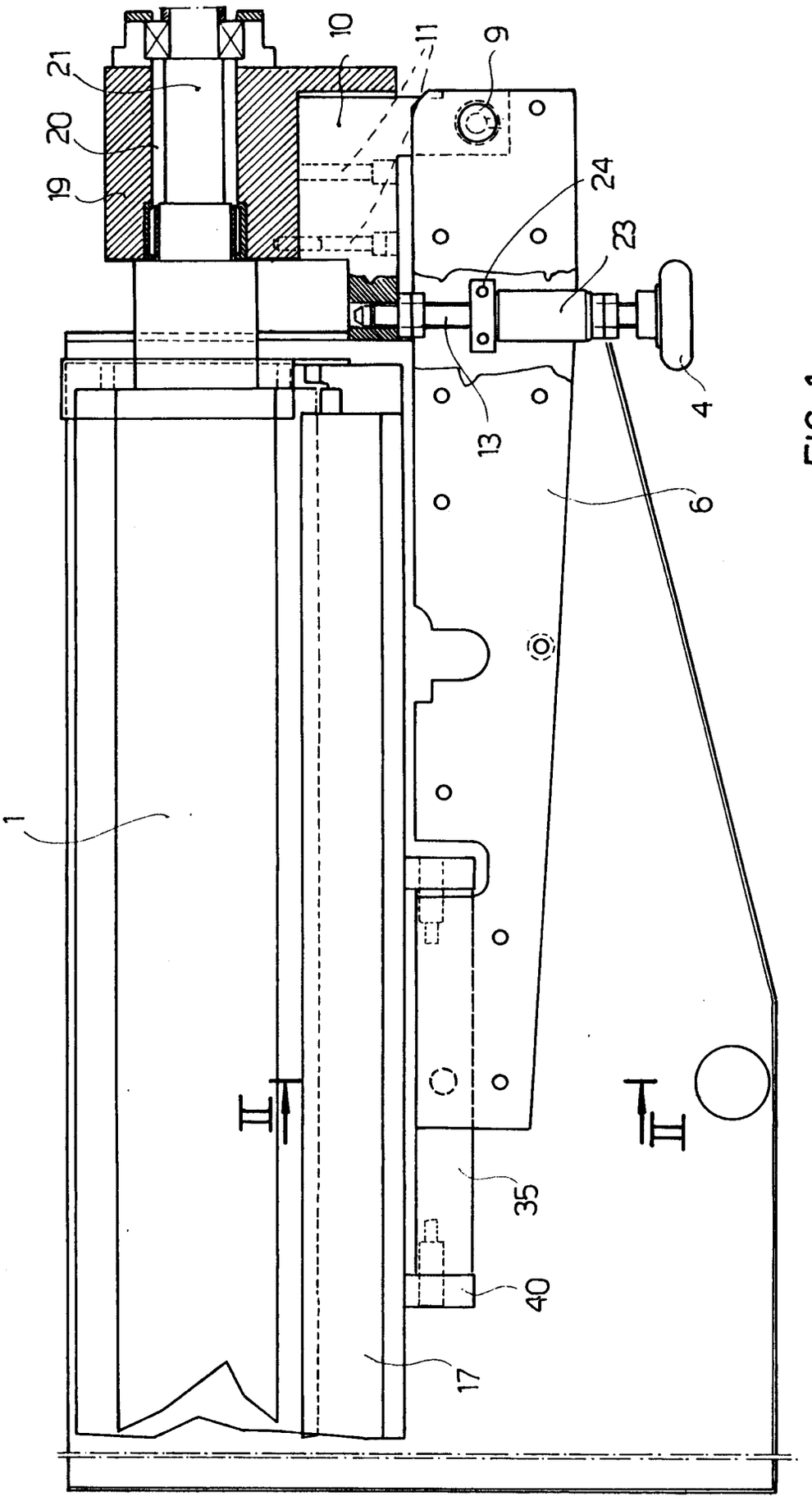

FIG. 1

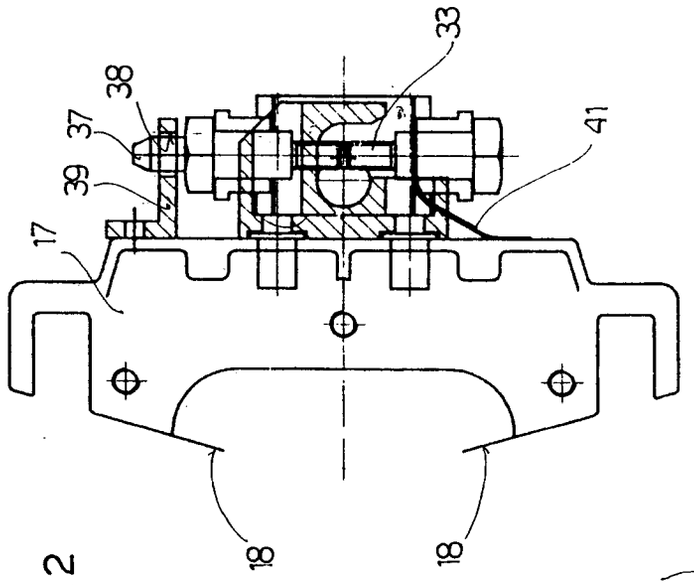

FIG. 2

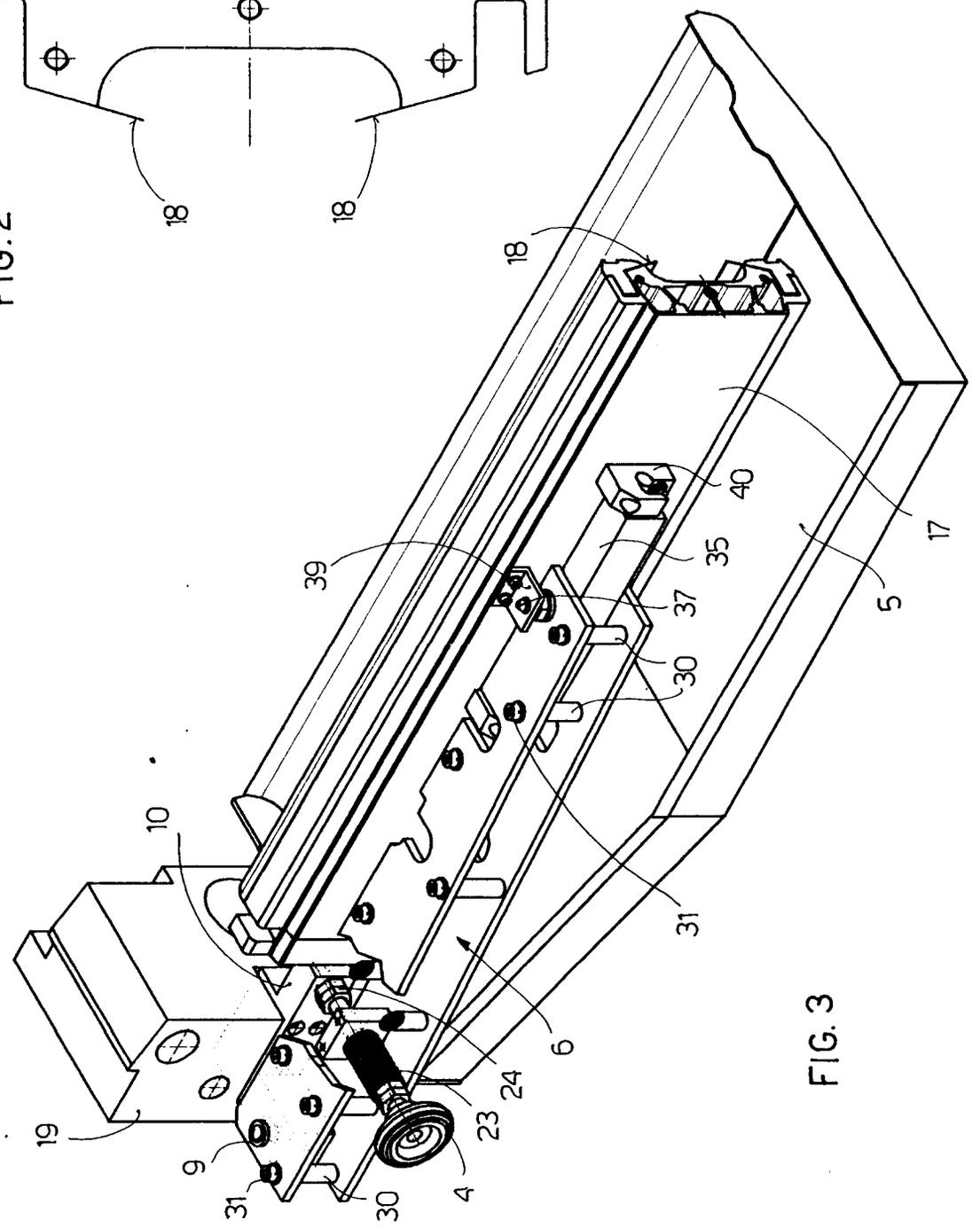

FIG. 3

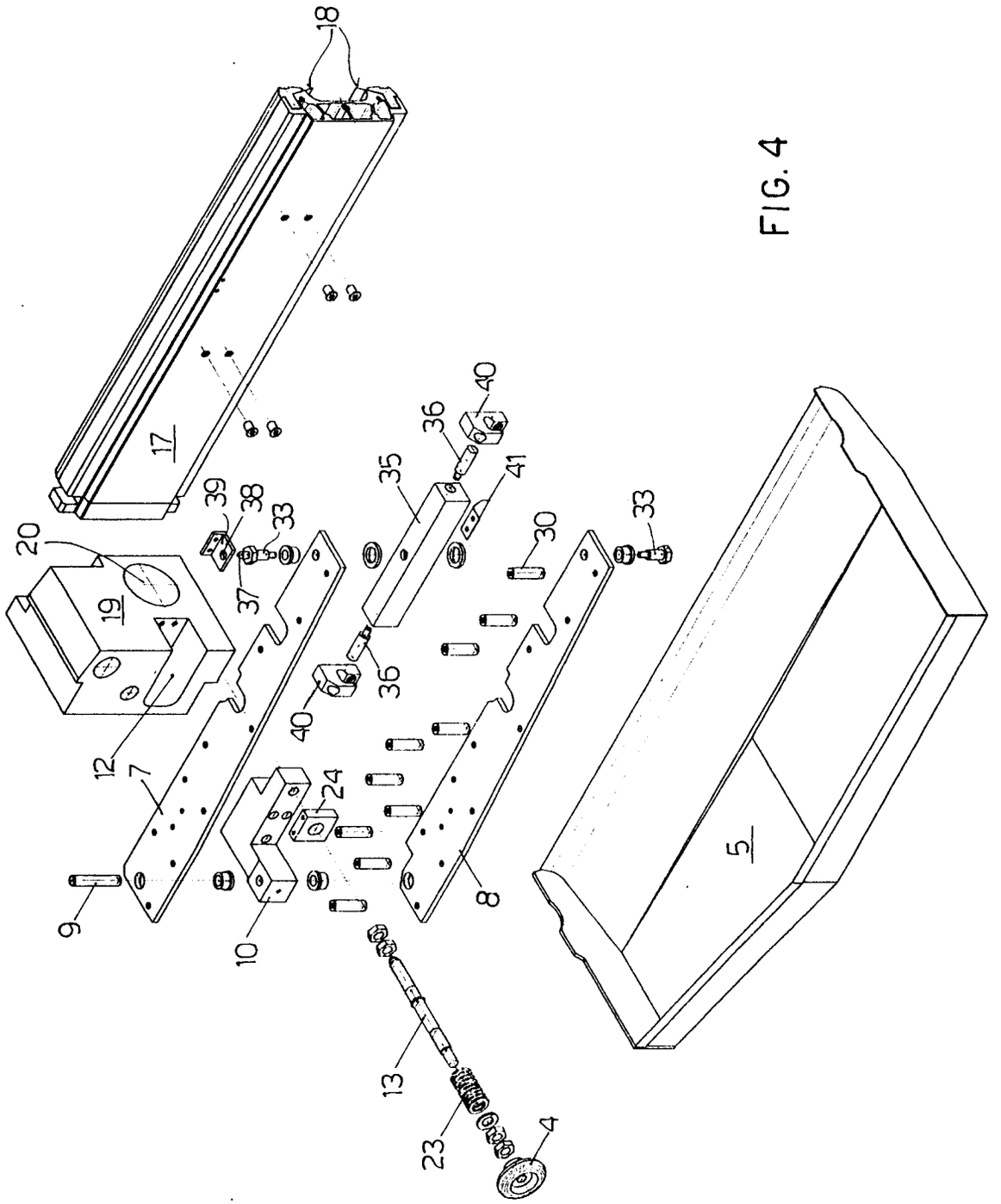

FIG. 4