Feb. 6, 1934. W. M. REICHART 1,945,703

PAPER CUTTING MACHINE

Filed June 17, 1932 2 Sheets-Sheet 1

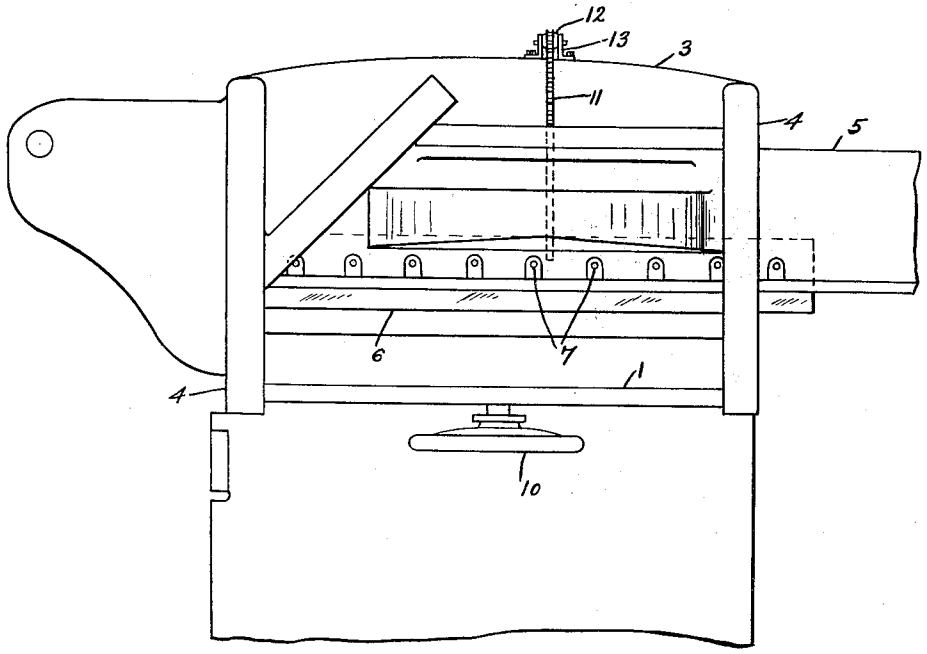


Fig. 1

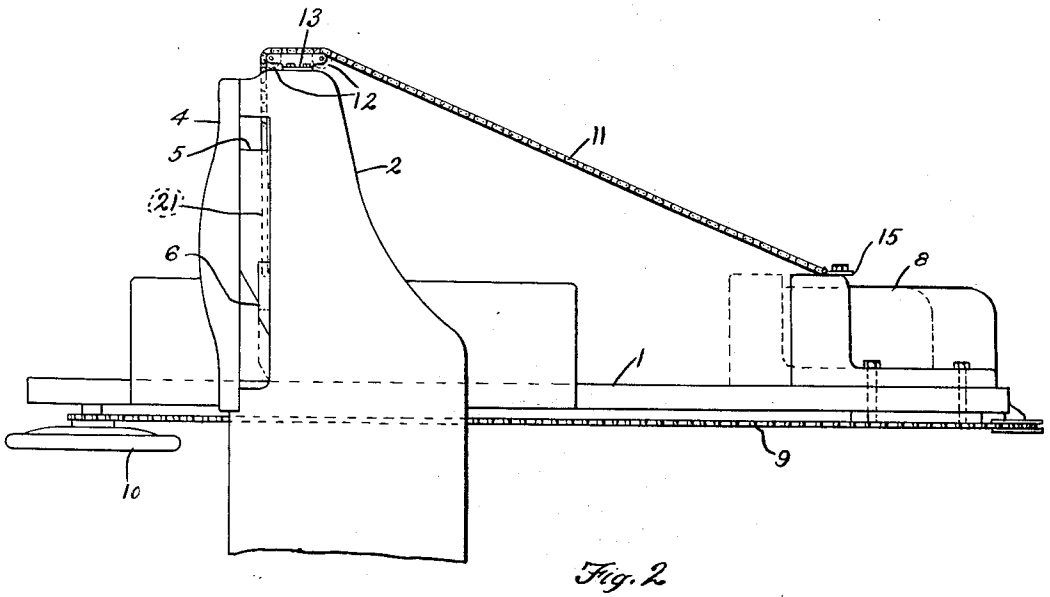


Fig. 2

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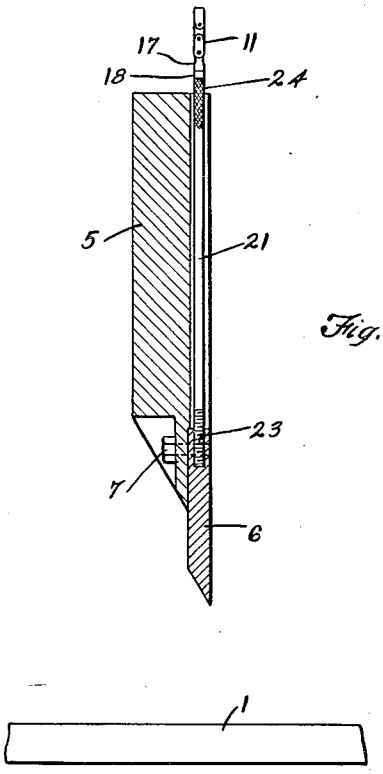


Fig. 3

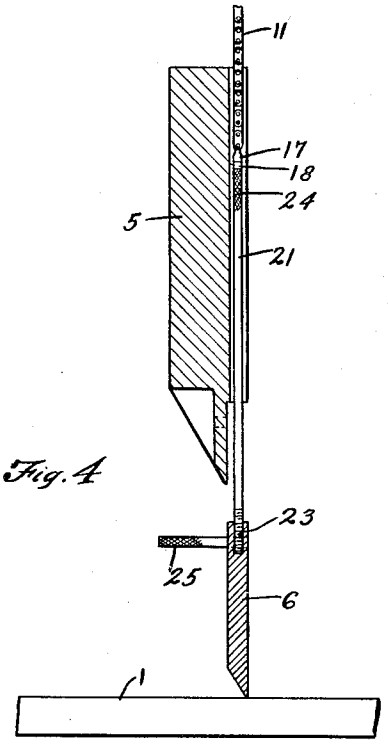


Fig. 4

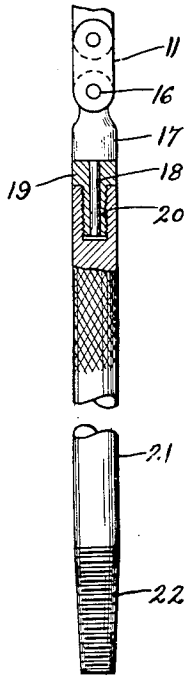


Fig. 5

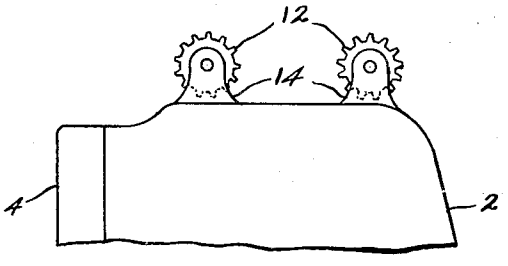


Fig. 6

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UNITED STATES PATENT OFFICE

1,945,703

PAPER-CUTTING MACHINE

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Application June 17, 1932. Serial No. 617,723

11 Claims. (Cl. 164—58)

This invention relates as indicated, to paper cutting machines, but has reference more particularly to the provision of improved means for removing the knife from the knife bar and replacing the same.

In power operated paper cutting machines, in which the knife is of considerable size and weight, the removal of the knife for sharpening or other purposes and the replacement thereof are usually attended with considerable difficulty and danger of serious injury to the person engaged in these tasks. For the purpose of facilitating such removal and replacement of the knife, several expedients have heretofore been used, but in the majority of these, it has been necessary, in order to provide a temporary support for the knife during removal or replacement thereof, to mutilate either the knife bar or the clamp which is usually associated with machines of the character described.

In cases where knife supporting devices are attached to the clamp of the machine, accidental or inadvertent power operation of the machine with the devices thus in place might result in material damage to the knife or other parts of the machines.

The present invention, accordingly, has as its principal object the provision of means whereby the knife may be quickly and easily removed with a minimum of physical effort, without consequential mutilation of any parts of the machine, and without danger of serious damage to the knife or other parts of the machine in case the machine should be inadvertently operated with the knife removing means in situ. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a front elevation of a paper cutting machine showing the knife removing means in situ; Fig. 2 is a side elevation of the paper cutting machine; Fig. 3 is a fragmentary cross sectional view through the knife bar and knife showing the knife in its upper position; Fig. 4 is a view similar to Fig. 3, but with the knife lowered and in position to be removed from the machine; Fig. 5 is an enlarged cross sectional view through a portion of the knife-removing device; and Fig. 6 is a fragmentary view of a modified form of the sprocket supporting means.

Referring more particularly to the drawings, the paper cutting machine, which is of standard construction, comprises a bed 1, upon which is mounted a frame consisting of side members 2, a top yoke 3, and gibs 4, the latter being secured to the side members 2. A knife bar 5, having a knife 6 removably secured thereto as by screw bolts 7, is guided for vertical sliding movement between the side members 2 and gibs 4 of the frame.

The machine is also provided with the usual back gauge 8, which is mounted on the bed of the machine and is adapted to be moved longitudinally thereof by means of a chain 9, operation of the chain to move the gauge back and forth being accomplished by a handwheel 10 disposed beneath the forward end of the bed.

The present invention is concerned particularly with the provision of means for removing the knife from the knife bar when it is to be sharpened and replacing the same.

For this purpose a chain 11 is provided which passes over sprockets 12, arranged in tandem and suitably journalled in a bracket 13, which is rigidly secured to the yoke 3. Instead of providing a separate bracket, such as 13, the top yoke 3 may be provided with spaced pairs of ears 14, cast integrally therewith, as shown in Fig. 6, in which case the sprockets will be journalled in such ears.

One end of the chain 11 is secured to a swivel 15 which is removably secured to the back gauge 8, and the other end thereof is secured, as by means of a pin 16, to a swivel 17 having a stem 18, the lower end of which is flattened so as to loosely retain on the stem a collar 19. The collar 19 is externally threaded so that it may be secured in a threaded aperture 20, in the upper end of a rod 21, which extends through a cored out recess in the rear of the knife bar 5. The rod 21 is provided at its lower end with a slightly tapered threaded portion 22 which is adapted to be received in a threaded aperture 23 in the upper edge of the knife 6, and is provided with a knurled portion 24 adjacent its upper end whereby the rod 21 and collar 19 may be easily rotated as a unit about the stem 18 when the rod is secured to or removed from the knife. By assembling the swivel 17, collar 19 and rod 21 in the aforesaid manner, rotation of the collar and rod will not be communicated to the swivel or chain.

When it is desired to remove the knife 6 from

the machine, the knife bar 5 and knife 6 attached thereto are raised to a position wherein the clearance between the lower end of the knife bar and the bed of the machine is greater than the height of the knife. The back gauge 8 is then moved forward by means of the handwheel 10 to a position wherein the rod 21 may be screwed into the aperture 23 in the upper edge of the knife, access to the knurled portion of the rod being had from the front of the machine.

The screw bolts 7 are then removed from the knife and knife bar, leaving the knife suspended from the rod 21. The back gauge 8 is then moved forward to gently lower the knife onto the bed of the machine, whereupon the rod 21 is unscrewed from the knife and the knife removed from the machine as by means of a pair of handles 25 which are adapted to be screwed into suitable apertures in the knife.

In replacing the knife, the steps in the aforesaid procedure are reversed, the knife, after the rod 21 is secured thereto, being lifted to its position of attachment to the knife bar by moving the back gauge rearwardly. After the knife is attached to the knife bar, the rod 21 is unscrewed therefrom and the rod and chain 11 may be either entirely removed from the machine or coiled or otherwise compacted so as to lie on the back gauge of the machine.

It is thus seen that means are provided whereby the knife may be quickly and easily removed from the machine with a minimum of physical effort and without consequential mutilation of any parts of the machine.

Should the knife bar and knife be inadvertently depressed before the rod 21 has been unscrewed from the knife, no serious damage to the knife bar or knife would result as the chain 11 would break before such damage could take place, whereas, the depression of the knife bar and knife, with temporary supporting devices secured to the clamp of the machine, could obviously result in serious damage to the knife and knife bar.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, and means adapted to be secured to said knife, and to temporarily support said knife by its upper edge during attachment or detachment thereof.

2. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, and means removably secured to said knife and adapted to temporarily support said knife by its upper edge during attachment or detachment thereof.

3. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, and a member removably secured to said knife and adapted to temporarily support said knife by its upper edge during attachment or detachment thereof.

4. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, and provided with an aperture in its upper edge, and a member adapted to be removably secured in the aperture in said knife and when so secured to support said knife by its upper edge.

5. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, and provided with a threaded aperture in its upper edge, and a rod having a threaded end adapted to be received in said threaded aperture, whereby the rod is adapted to temporarily support said knife during attachment or detachment thereof.

6. In a paper cutting machine, a knife bar, a knife, means whereby the knife is attachable to and detachable from the knife bar at will, and movable supporting means operable to temporarily support said knife by its upper edge and to move the knife during attachment and detachment thereof.

7. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, a back gauge, and means operable by said back gauge for movably supporting said knife during attachment or detachment thereof.

8. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, a back gauge, means secured to said knife and to said back gauge, whereby the knife is supported by the back gauge, and means for operating said back gauge whereby the knife is vertically moved during attachment or detachment thereof.

9. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, a back gauge, means adapted to be secured to said knife and to temporarily support said knife during attachment or detachment thereof, said means being also secured to said back gauge, and means for longitudinally moving said back gauge to thereby raise or lower said knife.

10. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, a back gauge, a rod adapted to be secured to said knife, a chain secured to said rod and said back gauge, and means for imparting longitudinal movement to said back gauge whereby said knife may be vertically moved to and from its position of attachment to said knife bar.

11. In a paper cutting machine, a vertically movable knife bar, a knife attachable to and detachable from said knife bar, a back gauge, a rod adapted to be secured to said knife, a chain secured to said back gauge, a connection between said rod and said chain whereby said rod may be rotated about its axis without imparting rotary movement to said chain, and means for imparting longitudinal movement to said back gauge whereby said knife may be vertically moved to and from its position of attachment to said knife bar.

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