Jan. 14, 1930. H. S. WILLIAMS 1,743,946

MEANS FOR FACILITATING THE APPLICATION TO OR REMOVAL OF THE KNIFE FROM PAPER CUTTING MACHINES

Filed March 22, 1928

Fig. 1.

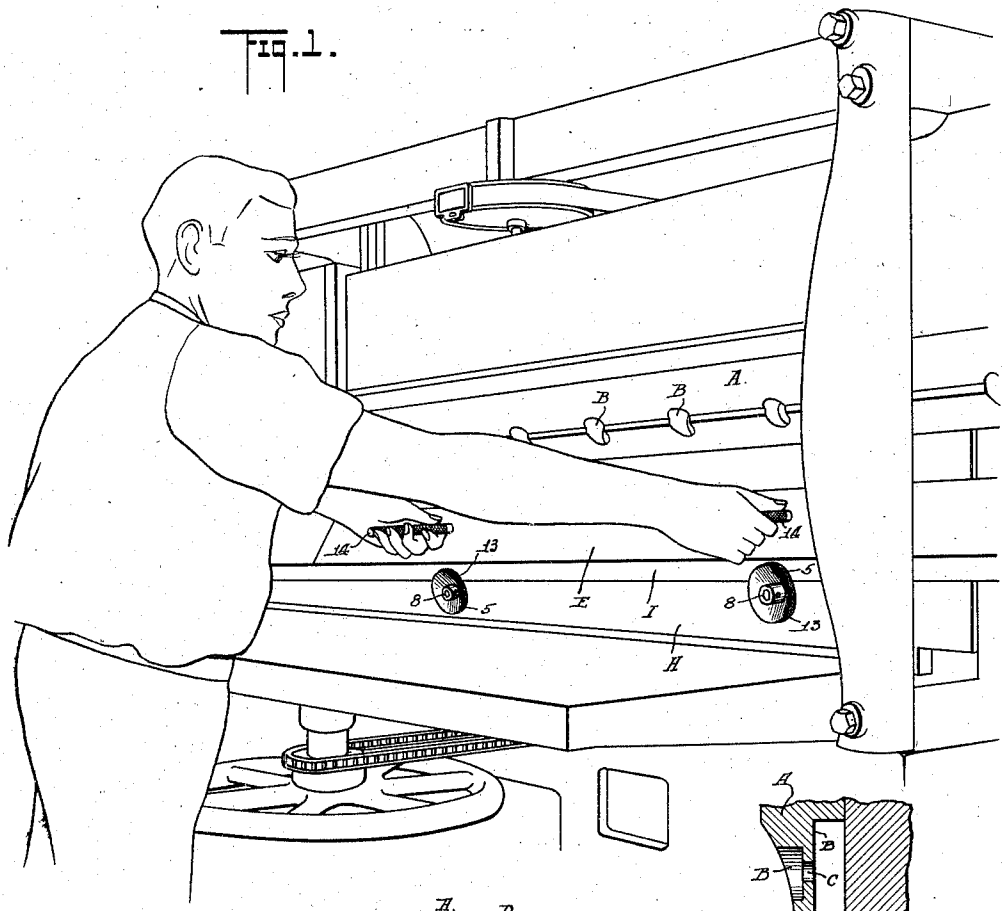


Fig. 2.

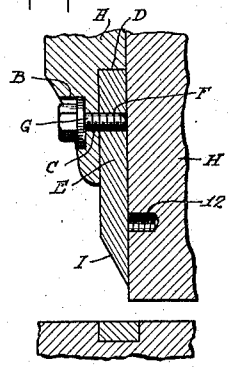


Fig. 3.

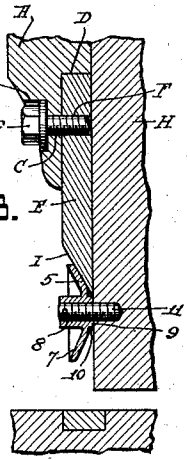
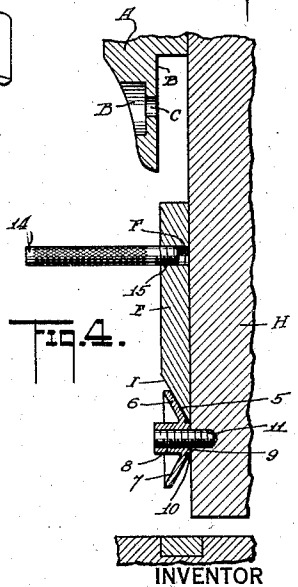


Fig. 4.



WITNESSES

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MEANS FOR FACILITATING THE APPLICATION TO OR REMOVAL OF THE KNIFE FROM PAPER-CUTTING MACHINES

Application filed March 22, 1928. Serial No. 263,908.

This invention relates to paper cutting machines which essentially include a vertically movable knife bar to which a knife is detachably connected and a clamp which is vertically and relatively movable with respect to the knife bar, and the invention more particularly refers to an improved means for facilitating the application to or removal of the knife from the machine.

The present invention is also in the nature of an improvement over my prior Letters Patent Nos. 1,377,042, granted May 3, 1921, and 1,503,408, granted July 29, 1924.

In improving upon the aforementioned patents, the present invention aims primarily to simplify the operations of removing or applying the knife, as well as to simplify the means employed in connection therewith.

The present invention further aims to provide a means for facilitating the application or removal of the knife from the machine which necessitates only the drilling and tapping or threading of a pair of apertures in the face of the clamp, thus avoiding mutilation of the machine or alteration of any of the other parts thereof.

More specifically, the invention comprehends in a paper cutting machine including a vertically movable knife bar to which the knife blade is detachably connected and a clamp vertically and relatively movable with respect to the knife bar; means for facilitating the application of the knife to or its removal from the knife bar which consists of devices connectable with the clamp for temporarily supporting the knife from said devices and the clamp while effecting relative movements between the clamp and knife bar to bring the knife bar and knife in relative positions for application and connection with the knife bar or removal of the knife after its disconnection from the knife bar.

The invention further aims to provide handle elements adapted for association with the usual threaded openings of the knife blade to permit of ready handling of the knife during its application and removal.

The invention further contemplates knife rest elements temporarily connectable with the clamp of the cutting machine to afford means upon which the knife may be temporarily rested during detachment and removal and during application and attachment.

With the above recited and other objects in view, reference is had to the following description and accompanying drawings, in which there is exhibited one example or embodiment of the invention, while the claims define the actual scope of the same.

In the drawings:

Figure 1 is a perspective view of a paper cutting machine illustrating the manner in which the knife is temporarily supported by the clamp of the machine either during its application to or removal therefrom.

Figure 2 is a fragmentary vertical sectional view illustrating the knife connected to the knife bar.

Figure 3 is a similar view illustrating the knife rest devices in place on the clamp with the knife in juxtaposition thereto prior to the disconnection of the knife from the knife bar.

Figure 4 is a similar view illustrating the knife and knife bar disconnected and separated with the knife blade temporarily supported by the clamp and with the handle members in place.

Referring to the drawings by characters of reference, A designates the knife bar which is formed with bolt recesses B and bolt openings C which communicate with the rabbeted lower rear edge D thereof. The knife blade E is provided with threaded openings F which align with the openings C when the knife is properly positioned in the rabbeted portion D. Means such as the bolts G secure the knife to the knife bar and said

bolts are removable to permit of the detachment of the knife from the knife bar. The machine further includes a clamp H which is vertically movable, as is the knife and knife bar, but which is also relatively movable with respect thereto.

The means for facilitating the application of the knife blade to or its removal from the knife bar comprises a plurality and ordinarily a pair of devices 5 which are directly connectable to the front face of the clamp H adjacent the lower end of the clamp, which devices are so constructed as to present angular portions 6 coinciding with the beveled face I of the knife blade and engaging said beveled face at a point beyond the cutting edge. As specifically illustrated, the devices are preferably in the nature of a frusto-conical head or flange member 7 carried by a hub or sleeve 8, the exterior conical surface of which terminates at its reduced end in a cylindrical boss or shank 9, which shank or boss 9 is of a lesser diameter than the diameter of the reduced end of the head or flange whereby an annular clearance portion 10 for the cutting edge of the knife is afforded when the devices are in active use for the temporary support of the knife resting thereon and against the front face of the clamp. As illustrated, the devices 5 are further formed with a reduced exteriorly threaded stem projecting beyond the boss or shank 9, which stem is adapted to threadedly engage in a threaded opening 12 which is drilled in the face of the clamp. The peripheral edge of each device 5 is roughened or knurled at 13 to afford means for rotating the devices during the engagement or disengagement of the stems with the threaded openings 12 of the clamp. The stems 11 may be formed integral or as a separate part of the devices.

In use, when it is desired to remove the knife from the machine, the clamp H and knife bar A are relatively moved with respect to each other until the threaded openings 12 are exposed. The devices 5 are then applied as illustrated in Figures 1, 2 or 3. The beveled portion I of the knife is then brought to a point where it contacts with the frusto-conical surfaces 7 of the devices 5, as clearly illustrated in Figure 3. The bolts or securing means G are then removed and relative movement between the knife bar and clamp is effected until the lower edge of the knife bar is disposed above the upper edge of the knife. In this position, the knife E is resting upon the devices 5 with its inner face against the front face of the clamp. In order to facilitate handling of the knife, handles 14 are employed which are provided with terminals 15 which are correspondingly threaded to engage within the threaded openings F from which the bolts have been removed. The operator may now grasp the handles 14, as clearly illustrated in Figure 1, and lift the knife from its temporary supported position on the devices 5 and the clamp 8. To replace the knife the operation is reversed, the operator positioning the knife on the devices 5, removing the handles 14 and then lifting the clamp until the upper edge of the knife is positioned within the rabbeted edge D of the knife bar. When the knife is thus positioned and the threaded openings F are aligned with the bolt openings C, the bolts or securing elements G are re-inserted, after which the devices 5 are removed. It will thus be seen that the necessity of slotting the knife bar or otherwise mutilating or altering the machine is eliminated, the only change on the machine necessary being the drilling of the threaded openings 12 in the front face of the clamp bar.

What is claimed is:

1. Means for facilitating the application to or removal of the knife from a paper cutting machine, including elements directly connectable with the front face of the usual clamp of the machine, said elements constituting knife rests upon which the knife is temporarily supported while relative movements between the knife bar and clamp are effected to dispose said parts in proper relation for application to or removal of the knife from the machine, said elements having angular portions coinciding with the beveled face of the knife and engaging said beveled face at a point beyond the cutting edge thereof.

2. Means for use in facilitating the application to or removal of a knife from the knife bar of a cutting machine of the type which includes a clamp; said means including a frusto-conical element terminating at its reduced end in a cylindrical shank of lesser diameter than the diameter of the reduced end of said element and interengaging means respectively provided on the free end of the shank and the clamp for detachably connecting the device with the clamp.

3. Means for use in facilitating the application to or removal of a knife from the knife bar of a cutting machine of the type which includes a clamp; said means including a frusto-conical element terminating at its reduced end in a cylindrical shank of lesser diameter than the diameter of the reduced end of said element, a reduced exteriorly threaded extremity formed at the free end of said shank and a threaded apertured portion on the clamp for the reception of said reduced threaded extremity.

4. In a paper cutting machine including a clamp, a knife bar and a beveled edged knife detachably connected to the knife bar; means removably connected to the clamp below the lower cutting edge of the knife for

engagement with the beveled edge of the knife above its cutting edge to support the latter when detached from the knife bar.

5. In a paper cutting machine including a clamp; devices temporarily connectable with the clamp below the lower cutting edge of the knife for the temporary support of the knife at points out of engagement with its cutting edge.

Signed at New York in the county of New York and State of New York this 20th day of March, A. D. 1928.

HORACE S. WILLIAMS.