

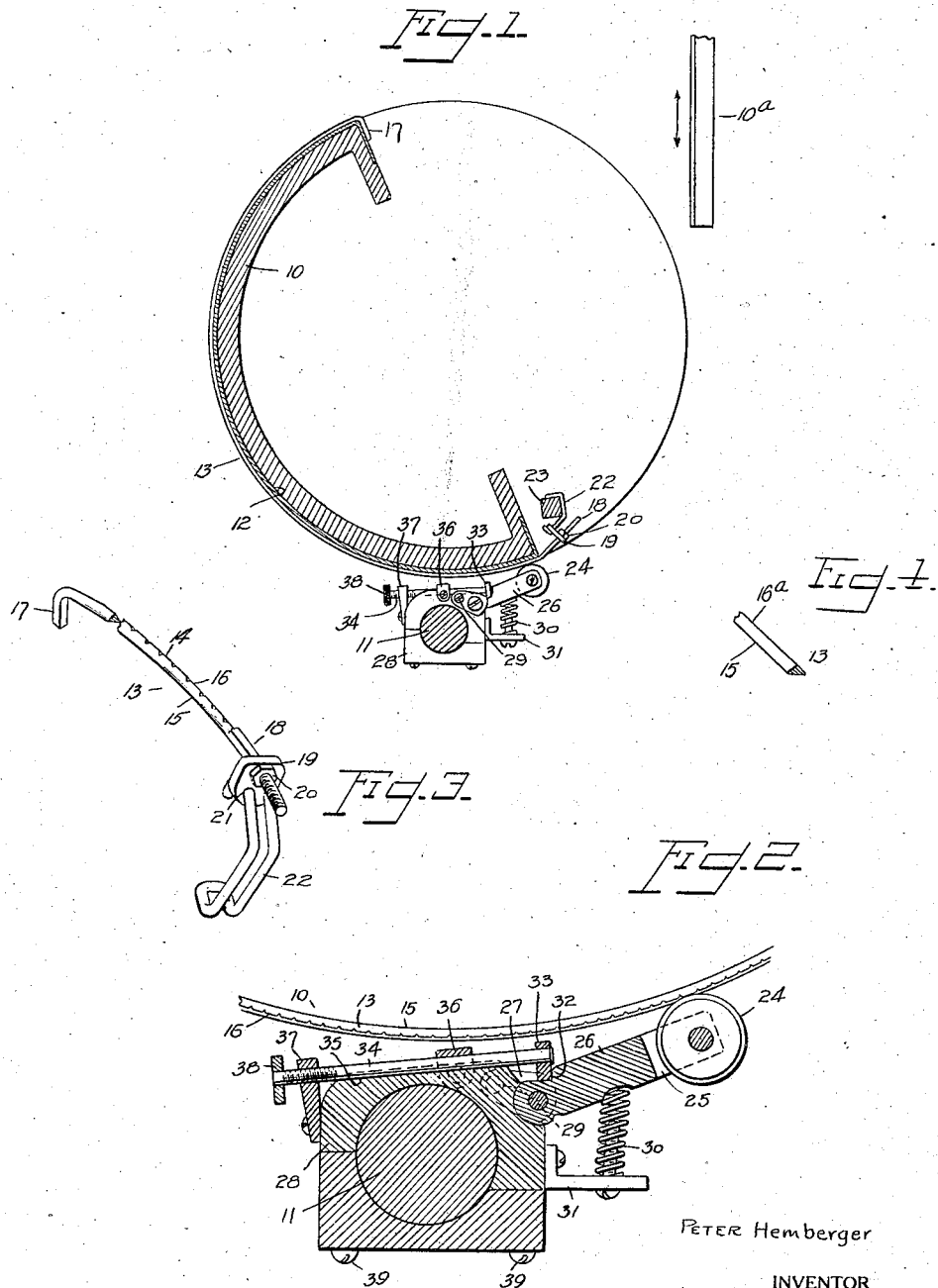
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P. HEMBERGER

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PERFORATING ATTACHMENT FOR PRINTING PRESSES

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PETER Hemberger

INVENTOR

BY *Otto Hemberger*
his ATTORNEY.

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PETER HEMBERGER, OF JERSEY CITY, NEW JERSEY.

PERFORATING ATTACHMENT FOR PRINTING PRESSES.

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This invention relates to improvements in a device for cutting and perforating sheets of paper and has reference to such a device in the form of an attachment for printing machines of the cylinder type.

Perforating devices of this character are employed to impress lines on sheets of paper for the purpose of facilitating the division of such sheets upon the impressed line. In connection with printing machines of the cylinder type, this work has heretofore been performed by perforating or cutting the paper on the impression cylinder by means of a disc having a serrated periphery provided with either a sharp cutting or a blunt punching edge working against the backing of soft material on the face of the cylinder. A sheet of paper to be printed and perforated is fed into the press where it is gripped along one edge by fingers carried by and operating on the cylinder. Rotary movement of the impression cylinder causes the paper to wrap about its surface over the backing material between the latter and the surface of a printing roller or plate. Preferably at a point in its travel with the cylinder where the paper is released the perforating discs are arranged to operate on the paper. It will be clear from the brief description above, that the perforating disc working against the backing material on the cylinder will, after a small run, cut into the backing and render it unusable as a backing. Therefore, as a consequence of the present perforating devices it may be necessary during a long run to change the backing on the cylinder a great number of times. The time consumed to change the backing results in considerable loss and naturally delays output.

With the foregoing in mind it is the purpose of the present invention to provide an attachment for a cylinder printing press, which may be used for perforating or cutting the sheets of paper fed in the impression cylinder without in any way damaging the backing of the latter or interrupting the operation of the press. I accomplish this purpose by means of an attachment comprising a serrated cutting edge applicable to the surface of the impression cylinder and yieldable means for holding the paper against the cutting edge during rotary movement of the cylinder.

One embodiment of my invention is illustratively exemplified in the accompany-

ing drawing, in which, Figure 1 is a substantially transverse sectional view taken through an impression cylinder of a press, showing my improved perforating attachment applied thereto; Figure 2 is an enlarged detail sectional view of the same; and Figures 3 and 4 are detail perspective views of the perforating and cutting blades of the invention.

Referring to the drawings, 10 denotes the rotary impression cylinder of a printing press, and 11 a fixed rod disposed beyond the periphery of the cylinder, the axis of the rod being parallel to that of the cylinder. Carried on the surface of the cylinder in the usual manner is a pad or backing 12, composed of sheets of soft material such as paper or felt for example. It will be clear that cylinders of this type are provided with suitable mechanism for gripping the edges of the sheets of paper being fed to the press, but for the purposes of illustrating the present invention, details not specific to the invention have been omitted from the drawing. The printing plate 10^a is illustrated diagrammatically in Figure 1 and is adapted to move with the surface of the cylinder in the usual manner.

After the cylinder 10 has been properly set up with the necessary backing 12, I propose to superimpose on the surface of the backing one or more perforating or cutting knives 13. Each knife comprises a length of flexible tool steel having its mid portion substantially triangular in cross section. One side of the knife then becomes the base 14 which is held in contact with the surface of the packing 12, while the apex of the knife is serrated to form a perforating edge 16, as illustrated in Figure 3 or sharpened to provide a cutting edge 16^a, as illustrated in Figure 4. One end of the knife 13 is bent at an angle to form a hook portion 17 adapted to hook over the edge of the cylinder, the opposite end 18 of the knife being round and threaded to accommodate a plate 19 loosely carried thereby and adjustable over the threads by means of a nut 20. The threaded end 18 of the knife is bent at an angle to the triangular portion thereof so that when the knife is superimposed on the cylinder the latter end will project inwardly and below the periphery. The plate 19 is provided with two spaced openings 21 which receive the opposite ends of a bent wire hook 22. This hook 22 is substantially

U-shaped, one angle thereof being adapted to embrace a rod 23 arranged within the cylinder 10 between the opposite end walls. It will be clear that having engaged the hook 17 over one edge of the cylinder and the hook 22 about the rod 23 adjacent the other edge, adjustment of the nut 20 will tend to tighten the knife over the face of the cylinder. Adjustment of the knife to coincide with the required position on the cylinder may be made before the nut 20 is tightened.

During movement of the sheet of paper to be printed with the impression cylinder 10, the paper will rest over the perforating or cutting edge 16-16^a and in order to exert sufficient pressure on the paper to cause the edge 16-16^a to penetrate the paper I provide a fibre roller 24 which yieldably engages the paper against the edge of the knife. The roller 24 is rotatably mounted between the forked end 25 of a pivoted arm 26, the pivoted end thereof being carried by a link connection 27 mounted on a block 28. The pivoted connection between the arm 26 and link 27 is normally on an elevation below a center line drawn between the fixed pivot 29 of the link 27 and the axis of the roller 24. A coiled spring 30, supported at one end in a bracket 31 arranged on the block 28 and yieldably pressing outwardly against the mid portion of the arm 26, tends to push the roller 24 in the direction of the surface of the cylinder and consequently engages the paper against the knife edge 16-16^a of the knife.

In order to adjust the roller 24 with respect to the cylinder 10, and consequently limit the distance the roller may approach the surface of the cylinder, the arm 26 is provided with a notch 32 disposed just beyond the pivotal connection of the arm and link 27 and adapted to function as a shoulder against which a shoe 33 is arranged. The shoe 33 is loosely carried at the free end of a rod 34 which is rotatably supported in a groove 35 along one edge of the block 28, the rod being held in the groove by means of a strap 36 embracing the rod and attached to the block. The opposite end of the rod 34 is threaded and is adjustable in a threaded opening of a bracket 37 attached to the block 28. To facilitate adjustment of the rod 34 by rotary movement thereof the end beyond the bracket 37 is provided with a knurled thumb piece 38. It will be clear that as the shoe 33 is adjusted towards the arm 26, pressure against the shoulder of a notch 32 will cause the arm to swing away from the cylinder and against the tension of the spring 30.

The block 28 is preferably a split member having a bore projecting in a direction parallel to the axis of the roller 24, the bore being arranged to receive the fixed rod 11 of the press. Adjustment to tighten screws 39

in the split portions of the block 20 will tend to set the attachment rigidly on the rod 11 and in desired position with respect to the cylinder.

In operation, the desired position of the line of perforations is ascertained; then the hook 17 of the knife 13 is placed over one edge of the impression surface of the cylinder 10 and the other hook 22 is engaged over the rod 23. The knife 13 is thereafter adjusted longitudinally of the cylinder to its correct position and the nut 20 tightened to cause the knife to closely embrace the surface of the cylinder on top of the backing. The block 28 is then adjusted over rod 11 until the roller 24 coincides with the path of travel of the knife 13. As a final operation the position of the roller with respect to the knife 13 is determined by adjustment of the thumb wheel 38, rod 34 and shoe 33. It will be clear that according to the present invention, paper disposed over the knife 13 will be cut or perforated but without in any way damaging the surface of the backing which is never touched by the cutting edge of the knife, as practiced in perforating attachments now in use.

What I claim as new and desire to secure by Letters Patent is:—

1. In combination, an impression cylinder for a printing press, means attachable to said cylinder to impress a line in a sheet of paper carried by the cylinder, and a roller platen for holding the paper in contact with said first means.

2. In combination, an impression cylinder for a printing press, a knife attachable to said cylinder, and a yieldable roller platen in the path of said knife for holding a sheet of paper in contact with the knife.

3. In combination, an impression cylinder for a printing press, a flexible knife adapted to embrace said cylinder, and a yieldably supported roller arranged to operate in the path of said knife and against the paper being carried by the cylinder, to impress a line in the paper for the purpose of facilitating the division thereof upon the impressed line.

4. A device for impressing a line in paper for the purpose of facilitating the division thereof upon the impressed line, comprising a knife adjustable on a rotary cylindrical support, and a yieldably supported member adjustable with respect to the longitudinal and transverse axes of the knife for holding the paper against the latter.

5. In a perforating attachment, a rotary cylindrical support, a cutting tool therefor comprising a flexible steel knife having a serrated cutting edge and end portion attachable to said cylindrical support, and means arranged exteriorly of said support and comprising a block adjustable axially of the cylindrical support, a pivoted arm

carried by said block, a spring to support the arm in the direction of the cylindrical support, and a roller carried at the free end of said arm and adapted to operate in the path of the knife to impress the paper over the knife.

6. A cutting tool for a perforating attachment of the character described, comprising a length of flexible tool steel rod, the latter having its mid portion substantially triangular in cross section, one side of the rod forming the base and the apex being serrated to form a cutting edge.

7. A cutting tool, as claimed in claim 6, in which one end of the rod is bent to form a hook and the opposite is threaded, fastening means disposed over the latter end, and means adjustable on the threaded end to engage the first means and adjust the same.

8. In combination, a printing press having a rotary impression cylinder, a fixed member disposed axially and outside the cylinder, backing for said cylinder against which the paper to be printed is carried by the cylinder, and a perforating attachment for the press, comprising a flexible knife provided with hook ends to engage the ends of the impression surface of the cylinder, means for adjusting the knife in superimposed position on said backing, a block arranged on the fixed member of the press, and an adjustable yieldably supported roller carried by the block and operating in the path of the knife to impress the paper over the latter during rotary movement with the cylinder.

In testimony whereof I affix my signature.
PETER HEMBERGER.