

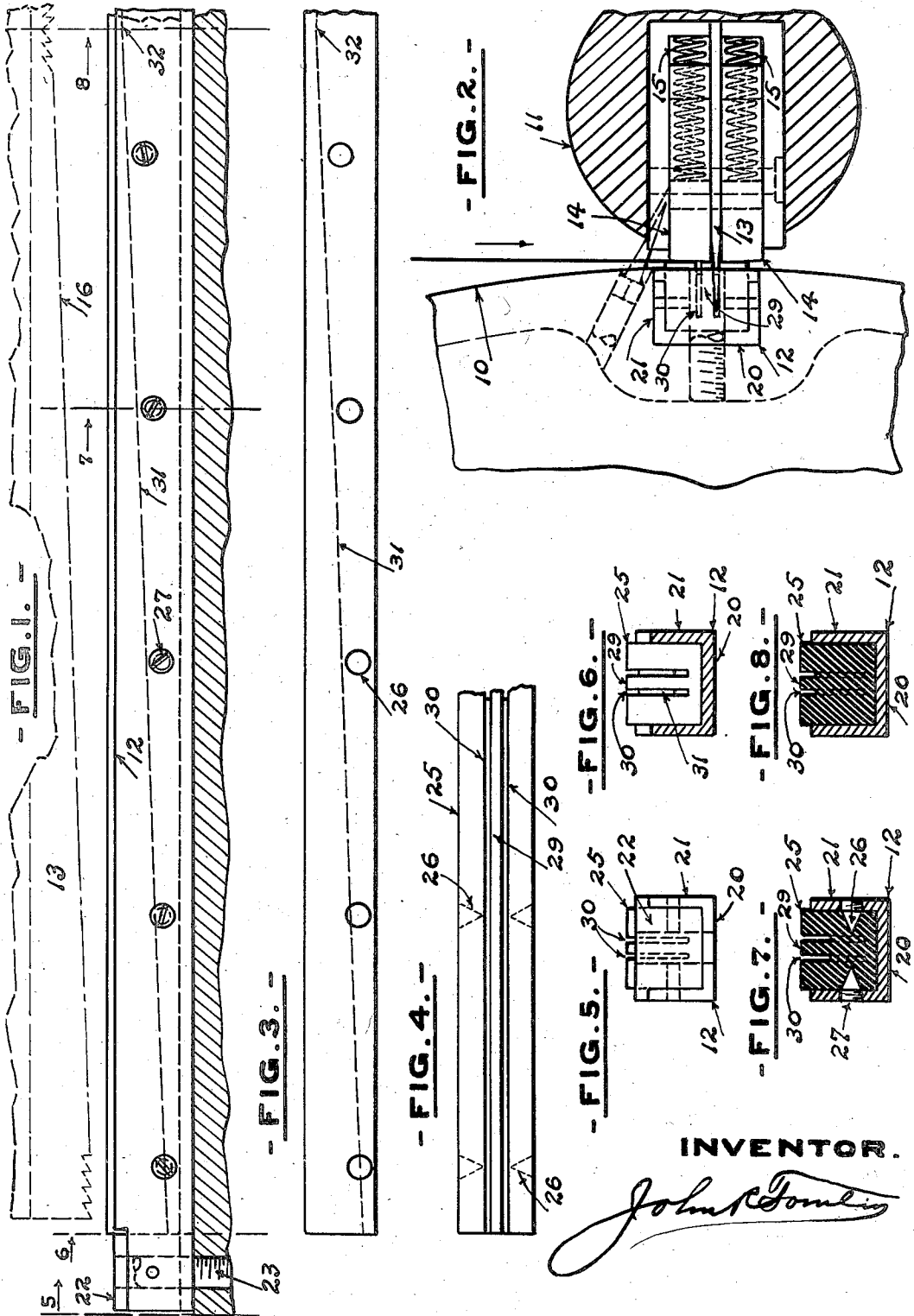
July 9, 1935.

J. R. TOMLIN

2,007,731

CUTTING MECHANISM FOR PRINTING MACHINE FOLDERS

Filed April 22, 1933



INVENTOR.

John R. Tomlin

UNITED STATES PATENT OFFICE

2,007,731

CUTTING MECHANISM FOR PRINTING
MACHINE FOLDERS

John R. Tomlin, Alexandria, Va., assignor to
Irving Trust Company, permanent trustee for
R. Hoe & Co., Inc., New York, N. Y., a corpora-
tion of New York

Application April 22, 1933, Serial No. 667,462

16 Claims. (Cl. 164—66)

This invention relates to certain improvements in cutting blocks or rubbers for use in printing machine folders, and especially the type commonly known in the art as "three to two folders", in which the product is cut in long and short sheets and assembled.

In certain types of cutting mechanism used for this purpose, a rotary cutter is employed in which one of the cutting knives or cutting blades is mounted slightly less than 180° behind the other, so that the cutting blades reach their cutting position at different points on the cooperating folding and collecting cylinder.

It is an object of this invention to improve the construction of these cutting blocks or rubbers so that long and short sheets may be cut, and it is the especial object of the invention to provide an improved cutting block for use in the type of printing machine folders disclosed in my co-pending application on Folding mechanism, Serial No. 492,990, filed November 3, 1930. In this type folder the cutting blades, although operably mounted on the cutting cylinder, are arranged to maintain radial disposition with respect to the axis of the folding or collecting cylinder during the entire cutting operation. Inasmuch as the cutting blades are maintained throughout their entire cutting operation in radial relationship with respect to the axis of the folding and collecting cylinder, it is manifest that no operative lateral movement of the cutting blade takes place in the rubber during the cutting operation. On the contrary the cutting blade moves radially into the cutting block during its cutting operation and then withdraws radially from the cutting block after the sheet is severed. It has been determined by experience and experiments that resilient material, such as rubber, or substance of like characteristics, is employed to best advantage in providing cutting blocks for use in folders of this type, and it has been determined that narrow slots pre-formed in the cutting rubber for receiving the cutting blades prolongs the life of the rubber and improves the appearance of the product. Furthermore, it has been discovered that the provision of a narrow pre-formed slot with a width slightly in excess of the minute lateral dimension of the cutting edge, but of less width than the thickness of the cooperating cutting blade, is advantageous. If the slots are cut by the cutting blades during their initial operative contact with the cutting rubber, in conformity with the usual practice, the side walls of the slots so cut close against each other after the cutting blade is withdrawn, and any minute

inadvertent lateral deviation of the cutting blade during its subsequent cutting operation causes the blade to again cut the rubber block and consequently produces thin rubber ribbons. When the cutting blades again encounter these ribbons they tend to either clog the slots or to draw inwardly the side walls of these slots and thereby cause the cutting blades to cut additional ribbons. However, by pre-forming relatively narrow slots in the cutting rubber and limiting their width to permit only minute lateral movement of the cutting blades, then in all subsequent cutting operations of the blades they are guided into the slots without cutting ribbons from their side walls. It has also been determined that in cutting blocks to be employed with the type of folder disclosed in my co-pending application Serial No. 492,990, it is necessary that the central rib defined by the spaced slots receive as much support as possible. Therefore, it is an object of this invention to provide relatively narrow pre-formed slots in the cutting blocks and the bottom of these slots inclined upwardly towards the center of each block to form an apex, thereby imparting or lending maximum support to the outer surfaces of the cutting rubber. It is possible to employ the inclined bottom walls for the slots because the co-acting cutting blades have their cutting edges, inclined, as set forth in my application hereinbefore referred to, and attention is directed to the fact that the bottom walls may be inclined upwardly from the center and towards the terminals of the block with good result, and without departing from the spirit of the invention.

A further object of this invention is to provide a cutting block and holder which can be expeditiously secured to and removed from the folding cylinder of a printing machine folder. An additional object of the present invention is to provide a relatively simple cutting block and holder arranged so that the cutting block may be quickly secured in and removed from its holder.

It is also an object of this invention to provide a cutting block of generally improved construction, whereby the device will be durable and inexpensive in construction, as well as practical, serviceable and efficient in its use.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts, and in the details of construction hereinafter described and claimed, it being understood that various changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is

claimed without departing from the spirit of the invention.

The invention has been illustrated in its preferred embodiments in the accompanying drawing, wherein:

Figure 1 is a fragmental sectional view cut radially through the folding and collecting cylinder of a printing machine folder, showing the improved cutting block and holder applied thereto,

Figure 2 is a fragmental end elevation, parts in section, of the folding and collecting cylinder and cooperating cutting blade support,

Figure 3 is a fragmental side elevation of the improved cutting block,

Figure 4 is a fragmental plan view thereof,

Figure 5 is an end elevation of the cutting block and holder viewed from the line 5—5 of Figure 1, and

Figures 6, 7 and 8 are transverse sections taken through the improved cutting block and holder and taken respectively on the lines 6—6, 7—7, and 8—8 of Figure 1.

Referring to the drawing, in which similar reference characters designate corresponding parts, there is shown a portion of a folding and collecting cylinder 10 and the cooperating cutting blade holder 11 which is operably mounted on the cutting cylinder, as disclosed in my co-pending application, Serial No. 492,990. The folding cylinder may have any desired number of cutting block holders 12 secured thereto and in the present instance three blocks are employed and two cutting blades 13 are operably supported by the cutting cylinder, not shown. Each cutting blade is secured between cheek blocks 14 and these cheek blocks are yieldingly held in projected position by means of helical springs 15. It will be understood that one cutting blade is operably positioned around the cutting cylinder at a point a little less than 180° behind the other cutting blade.

Each cutting block holder is in the form of an elongated trough, which is received within the usual recess formed in the cylinder 10, and is provided with a bottom member 20 and spaced side walls 21. A filler member or block 22 is positioned at each longitudinal terminal of the cutting block holder and is suitably secured to the bottom 20 and side walls 21 of the holder thereby producing a rectangular receptacle for the reception of the cutting block. A screw or other suitable securing device 23 extends through each block 22 and into the folding and collecting cylinder 10 thereby rigidly securing the cutting block holder 12 to this cylinder.

The cutting block 25 herein illustrated is in the form of an elongated strip of resilient material such as rubber, or substance of like characteristics, and being rectangular in cross-section. Any suitable means may be resorted to for securing the cutting block within its holder and in the present instance a plurality of conical recesses 26 are formed in the opposite sides of the cutting block for the reception of securing screws 27 which are threaded through the side walls 21 of the cutting block holder and have pointed ends which project into the recess 26 thereby locking the cutting block or rubber within its holder.

In carrying out this invention each cutting block or rubber 25 has spaced longitudinally-extending slots 30 formed therein, thereby defining a central rib 29. These slots may be moulded when the cutting block 25 is being formed or they may be otherwise pre-formed therein, as by cut-

ting or milling after the formation of the block but before this cutting block is put in normal cutting operation. Each pre-formed slot is relatively narrow but has perceptible width and, in the present instance, the bottom portion of the slot is defined by an inclined wall 31 which is inclined upwardly from the terminal portions of the cutting block or rubber to form an apex 32 at the central portion of the slot thereby shaping the bottom of the slot to conform to the tapered edges 16 of the serrated cutting blade 13.

In the operation of a cutting mechanism of this type, the edges 16 of the cutting blades 13 project relatively deep into the slots 30, and any inadvertent lateral deviation of the blade 13 which may be caused by manufacturing inaccuracies or wear of the operating components of the device, causes the cutting blades to cut thin ribbons from the side walls of the slots 30 if the width of these slots are not in excess of the minute lateral dimension of the cutting edge of the cutting blade. On the other hand, if the cutting slots 30 are formed with excessive widths improper cooperation between the cutting blade and block results and consequently ragged edges are cut in the product.

In order that the cutting blade and cutting block may properly cooperate to the best advantage, the slots 30 are pre-formed with perceptible width, but this width is less than the thickness of the cutting blade, and maximum rigidity is imparted to the rib 29 by inclining the bottom walls of these slots 30 thereby giving the advantage of relatively shallow slot portions. As the cutting blades 13 move radially into the slots 30 the side walls of the slots engage the tapered portion of the cutting blade thereby causing this blade to positively sever the product and produce neat cut edges thereon.

Having thus described my invention, I claim:—

1. A cutting block for use in printing machine folders, comprising a body member having a slot of perceptible width pre-formed therein, the slot extending longitudinally of the block and having its bottom wall inclined upwardly towards the center of the body member.

2. A cutting block for use in printing machine folders, comprising a resilient body member having a slot of perceptible width pre-formed therein, the slot extending longitudinally of the block and having its bottom wall inclined upwardly towards the center of the body member.

3. A cutting block for use in printing machine folders, comprising a body member having a slot of perceptible width pre-formed therein, the slot extending longitudinally of the body member and having its bottom wall inclined upwardly to form an apex at the central portion of the block.

4. A cutting block for use in printing machine folders, comprising a resilient body member having a slot of perceptible width pre-formed therein, the slot extending longitudinally of the body member and having its bottom wall inclined upwardly to form an apex at the central portion of the block.

5. A cutting block for use in printing machine folders, comprising a body member having a longitudinally-extending slot pre-formed therein, the slot being formed relatively deep at the opposed terminals of the body member and relatively shallow at the central portion of the body member.

6. A cutting block for use in printing machine folders, comprising a resilient body member hav-

ing a longitudinally-extending slot pre-formed therein, the slot being formed relatively deep at the opposed terminals of the body member and relatively shallow at the central portion of the body member.

7. A cutting block for use in printing machine folders, comprising a body member having a slot of perceptible width pre-formed therein, the slot having an inclined bottom wall defining the slot so that a portion of it is relatively deep and a portion relatively shallow.

8. A cutting block for use in printing machine folders, comprising a resilient body member having a slot of perceptible width pre-formed therein, the slot having an inclined bottom wall defining the slot so that a portion of it is relatively deep and a portion relatively shallow.

9. A cutting block for use in printing machine folders, comprising a body member having longitudinally-extending spaced slots formed therein, a rib defined by the spaced slots, portions of the slots being relatively deep and portions relatively shallow.

10. A cutting block for use in printing machine folders, comprising a resilient body member having longitudinally-extending spaced slots formed therein, a rib defined by the spaced slots, portions of the slots being relatively deep and portions relatively shallow.

11. A cutting block for use in printing machine folders, comprising a body member having spaced longitudinally-extending slots formed therein, a longitudinally-extending rib defined by the slots, the slots and rib being relatively deep at portions of the body member and relatively shallow at other portions of the said body member.

12. A cutting block for use in printing machine folders, comprising a resilient body member having spaced longitudinally-extending slots formed therein, a longitudinally-extending rib defined by the slots, the slots and rib being relatively deep at portions of the body member and relatively shallow at other portions of the said body member.

13. In a cutting mechanism for printing machine folders, the combination of a folding cylinder, a cutting block secured to the folding cylinder and having a longitudinally-extending slot pre-formed therein, a cutting blade supported to operably cooperate with the cutting block and having its cutting edge inclined, the bottom wall of the said slot being inclined to substantially conform to the inclined cutting edge of the cutting blade.

14. In a cutting mechanism for printing machine folders, the combination of a folding cylinder, cutting blocks secured to the folding cylinder and each block having spaced longitudinally-extending slots formed therein, a longitudinally-extending rib defined in the body member by the said slots, cutting blades operably supported to cooperate with the cutting blocks, each blade having its cutting edge inclined, the bottom wall of the slots formed in the cutting block being inclined to substantially conform to the cutting edge of the cutting blade.

15. In a cutting mechanism for printing machine folders, the combination of a folding cylinder, cutting blocks secured to the folding cylinder and each cutting block having spaced longitudinally-extending slots formed therein, a rib defined by the said slots, cutting blades operably supported to cooperate with the cutting blocks and having their cutting edges inclined so that the terminal portions of each blade projects beyond its central portion, the bottom walls of the slots formed in the cutting block being inclined to substantially conform to the cutting edges of the cutting blades.

16. In a cutting mechanism for printing machine folders, the combination with a cylinder, a cutting blade coacting with the cylinder and operable with a relatively great radial movement with respect to the cylinder, of a resilient one-piece cutting block secured to the cylinder and having a relatively deep radially disposed longitudinally extending slot preformed therein for the operable reception of the cutting blade, the width of the slot being less than the thickness of the cutting blade and not less than one-half its thickness.

JOHN R. TOMLIN.