Dec. 9, 1952 C. D. CHASE 2,620,874

MACHINE FOR CUTTING INDEX NOTCHES

Filed Sept. 23, 1950 4 Sheets-Sheet 1

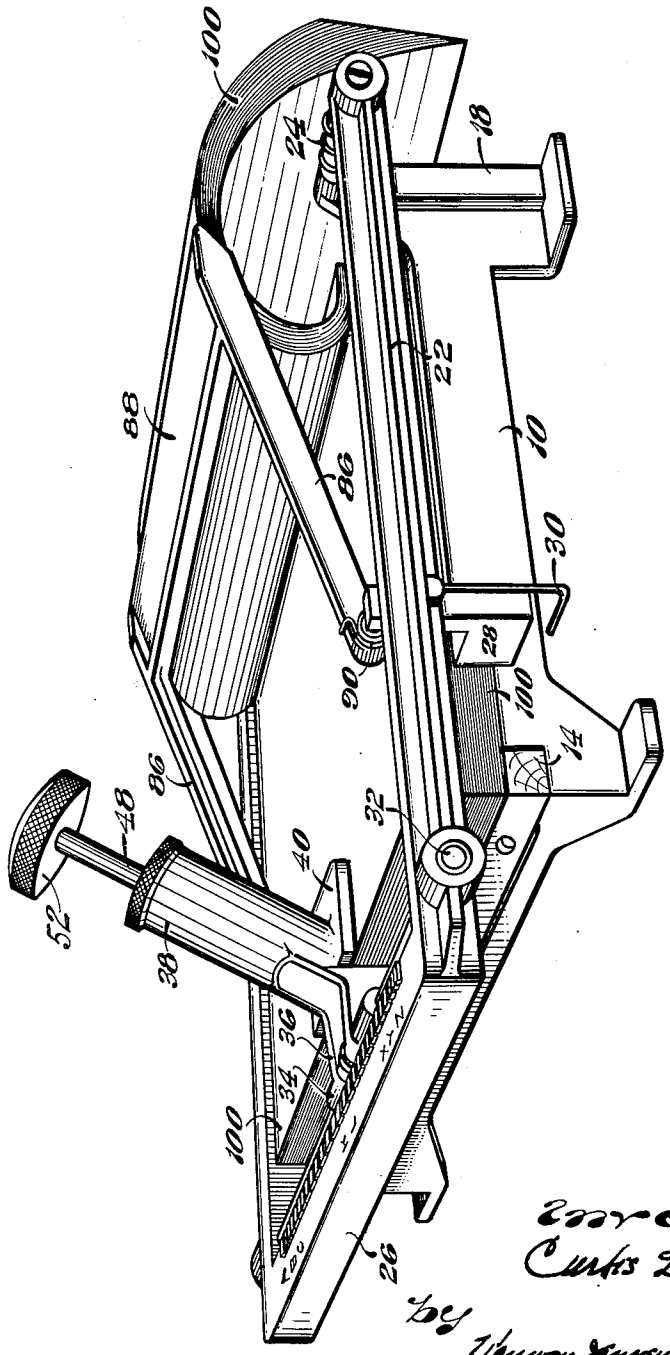

Fig. 1

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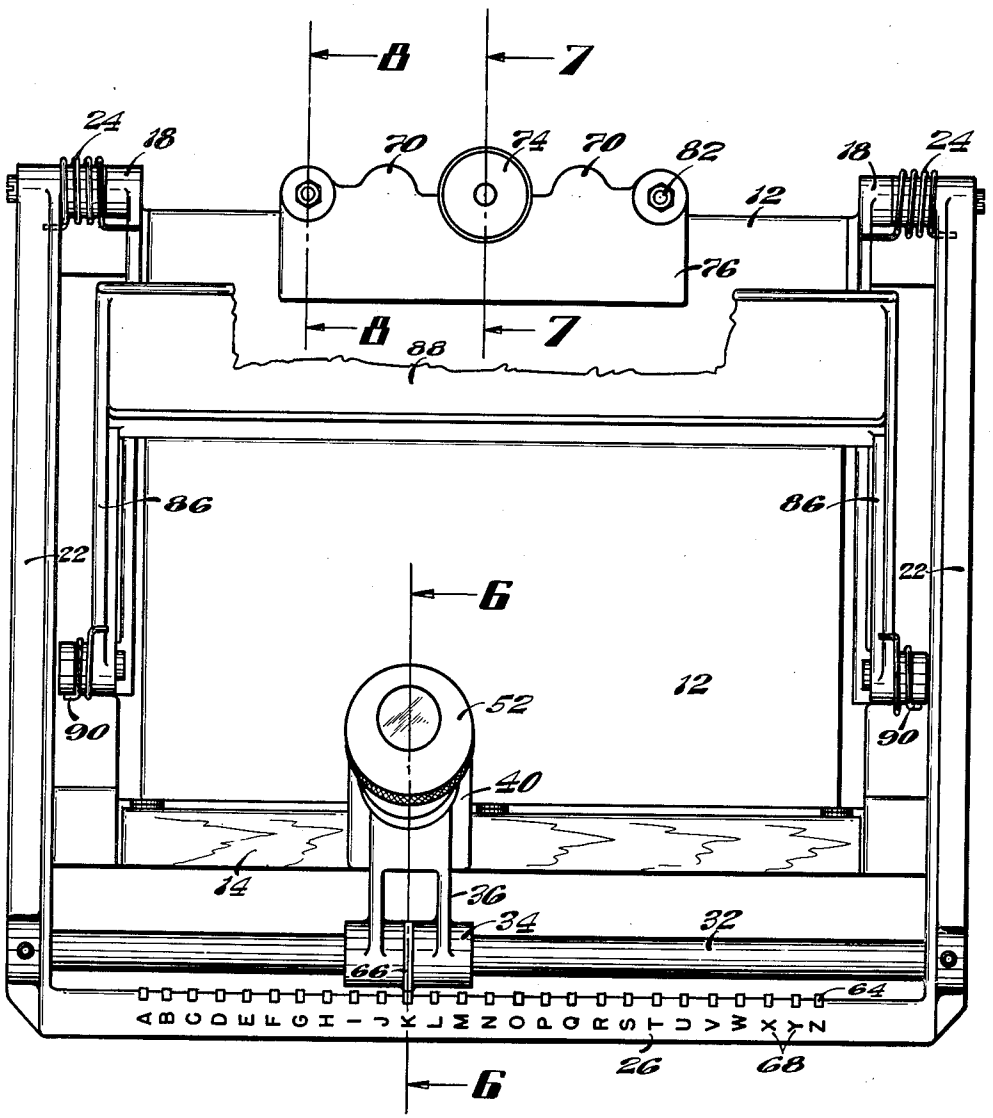

Fig. 2

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MACHINE FOR CUTTING INDEX NOTCHES

Filed Sept. 23, 1950 4 Sheets-Sheet 3

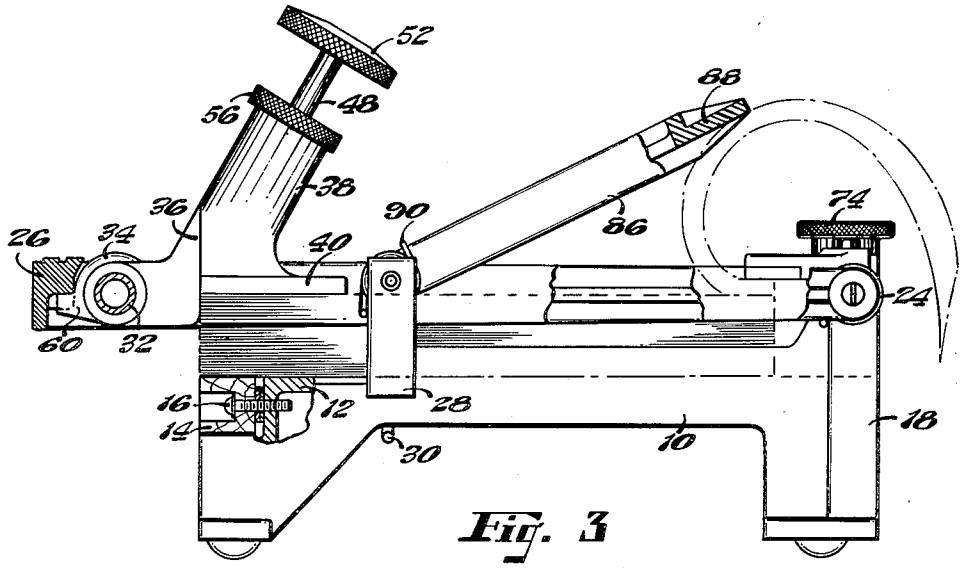

Fig. 3

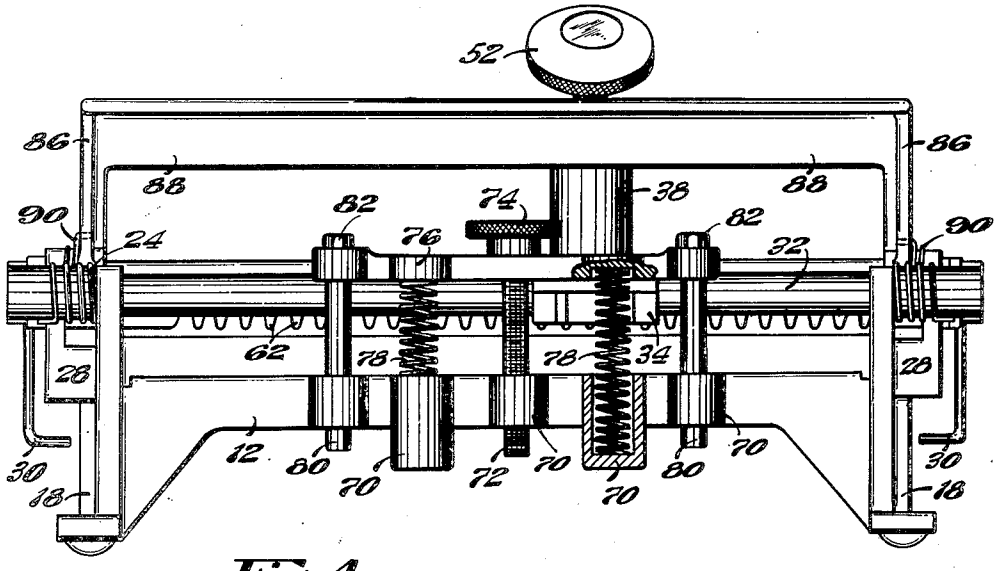

Fig. 4

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MACHINE FOR CUTTING INDEX NOTCHES

Filed Sept. 23, 1950 4 Sheets-Sheet 4

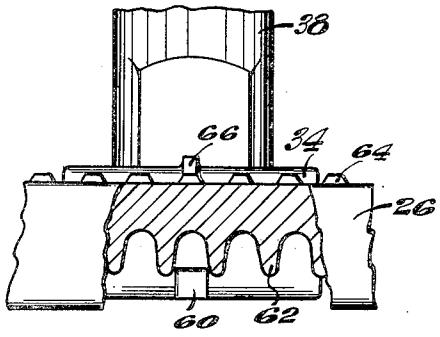

Fig. 5

Fig. 6

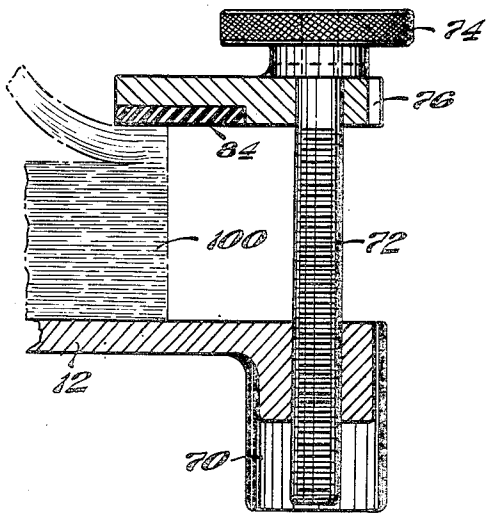

Fig. 7

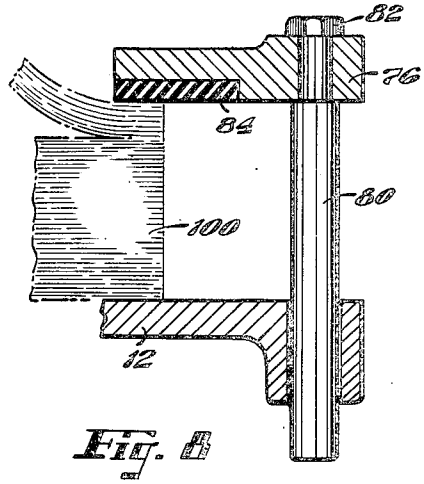

Fig. 8

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UNITED STATES PATENT OFFICE

2,620,874

MACHINE FOR CUTTING INDEX NOTCHES

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Application September 23, 1950, Serial No. 186,344

4 Claims. (Cl. 164—50)

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My invention comprises a novel and useful machine by means of which index notches may with rapidity and facility be formed in the unbound edges of directories, dictionaries and similar books in which the contents are arranged in alphabetical or numerical order.

While the desirability of providing a book, such as the telephone directory of a large city, with index notches has long been recognized, it has hitherto been regarded as an expensive luxury, the result being that it is only the most expensive works which are so equipped. It is the most important object of my invention to provide a simple, effective machine by which the operation of cutting index notches may be carried out accurately, rapidly, and cheaply.

The most important feature of the invention resides in the combination of a frame supporting a clamp for the bound back of the book, together with a movable bracket upon which is mounted a carriage bearing a cutter and registering means by which the cutter may be shifted rapidly in step-by-step sequence through any desired number of cutting stations.

Another feature of the invention comprises means integral with the carriage for clamping the unbound edges of the book during the cutting operations, this clamp being automatically brought into play at the commencement of the cutting operation.

These and other objects and features of the invention will be more readily understood and appreciated from the following detailed description of a preferred embodiment thereof selected for purposes of illustration and shown in the accompanying drawings, in which—

Fig. 1 is a view in perspective of the index notch cutting machine,

Fig. 2 is a plan view of the machine,

Fig. 3 is a view partly in side elevation and partly in cross section,

Fig. 4 is a rear elevation,

Fig. 5 is a view partly in elevation and partly in cross section of a detail illustrating the registering means,

Fig. 6 is a view in cross section along the line 6—6 of Fig. 2,

Fig. 7 is a view in cross section along the line 7—7 of Fig. 2, and

Fig. 8 is a view in cross section along the line 8—8 of Fig. 2.

As best shown in Figs. 1 and 4, the machine of my invention is organized about a rectangular frame 10 supporting a flat bed plate 12 and formed either from angle iron and sheet metal or, perhaps more conveniently, cast in a single piece of aluminum or other suitable material. The frame is recessed along its front upper margin to accommodate an elongated wooden block 14 secured to a depending flange of the bed plate 12 by means of a plurality of machine screws 16 set in counterbores of appropriate dimensions. At each of its rear corners the frame is reinforced by upright metal blocks 18 enlarged and bored at their upper ends to receive pivot pins upon which are mounted the ends of a pair of long arms 22 joined at their outer ends by a flat cross piece 26. In order to relieve the weight of the arms and cross piece I mount springs 24 at the root of the arms and arrange them to exert lifting force. Secured to each side of the frame 10 adjacent the front thereof is a block 28 which extends outwardly from the periphery of the frame to provide a stop member cooperating with a depending hook 30 secured at its upper end to the arm 22. The hooks 30 encounter the blocks 28 when the arms 22 have been elevated to a predetermined angle and thus serve to confine the movement of the cross piece 26 to a relatively small arc.

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Spanning the arms 22 closely adjacent the cross piece 26 is a shaft 32 upon which is slidably mounted a cylindrical sleeve 34 having an integral bifurcated yoke 36 merging at its outer end into a cylindrical barrel 38 which in turn provides support for an integral flat flange 40 poised over the bed plate 12. The sleeve 34 with the barrel 38 forms a carriage for a cutter comprising a cylindrical shank 42 terminating in its lower end in a hollow portion tapering to a sharpened cutting edge 44. The upper end of the cutter comprises an enlarged cylindrical head 46 dimensioned to fit snugly but slidably within the barrel 38 of the carriage. A plunger 48 is secured to the cutter by means of an elongated machine screw 50 and carries at its upper end a knob 52. The upper end of the barrel 38 is closed by a plug 56 which threads into the top of the barrel and is apertured to receive and guide the plunger 48. A helical compression spring 54 is contained within the barrel 38 and bears at its upper end against the cutter head 46, thus serving to urge the cutter and plunger upwardly.

Integral with the pivoting cylindrical sleeve 34 is a forwardly extending finger 60 adapted to be received successively in notches formed by spaced teeth 62 cut into the lower surface of the cross piece 26. On the upper surface of the cross piece 26 there is a series of serrations 64 each of which is located precisely above the notch lying between adjacent pairs of the teeth 62. A

ridge 66 is formed on the top of the sleeve 34 in precise registry with the finger 60. Adjacent each of the serrations 64 and on the upper surface of the cross piece 26 there is a cast character, ordinarily providing a complete alphabet, although a series of numbers may be employed if desired.

At the rear of the machine the bed plate 12 is provided along its margin with five lugs 70 the center one of which is drilled and tapped to receive a bolt 72 which carries at its upper end a knurled knob 74 bearing upon a metal plate 76. Two of the lugs 70 are bored to receive compression springs 78 which lift the plate 76 into engagement with the lower face of the knob 74. The outermost of the lugs 70 are bored through to receive guide pins 80 secured at their upper ends to the plate 76 by nuts 82. It will be evident that by turning the knob 74 the plate 76 may be adjusted up and down. In the lower forward portion of the plate 76 there is provided a recess into which is cemented a long strip of hard rubber 84.

Journalled in each of the blocks 28 is a pivot pin supporting an arm 86, the free ends of the arms being joined by a flat cross piece 88. A spring 90 is provided at the root of each arm 86 and arranged to exert downward thrust on the arms 86 and the cross piece 88.

When it is desired to operate the machine of my invention the knob 74 is turned counterclockwise until the plate 76 has been elevated to such an extent that the bound rear edge of a telephone directory or similar book can be slipped between the plate 76 and the bed plate 12, the directory being upside down so that the front cover is in contact with the bed plate. The directory is then adjusted until the front or unbound edges are flush with the forward edge of the cutter block 14. The knob 74 is now turned clockwise until the rear edge of the directory is securely clamped against the bed plate, the rubber strip 84 serving to provide a firm friction grip on the upper surface of the book. The directory is now opened (from the back) to expose the first page of "A's." The lifted pages are then rolled back under the cross piece 88 which serves to hold the book in open position with most of its pages extending out over the rear of the machine. The knob 52 is then lifted to pivot the carriage in counterclockwise direction which frees the finger 60 from engagement with the teeth 62 so that the carriage may be shifted axially until the ridge 66 is on the serration at the extreme left opposite the letter "A." Then the carriage is pivoted in clockwise direction until the finger 60 enters the notch between adjacent teeth 62 and the flange 40 lies flat upon the exposed pages of the book. Finally the knob 52 is simultaneously pushed downwardly and rotated back and forth until the cutter blade 44 works its way through the first few pages of the book. When the knob 52 is released the spring 54 restores it to normal position. The next step is to lift the cross piece 88 and pull beneath it all of the "B" pages of the book, whereupon it is released to engage the remaining pages of the book. The "B" pages are now brought forward, the carriage is rocked forwardly and the "B" pages brought flat beneath it. The carriage is now moved to the right, one notch, until the ridge 66 lies opposite the letter "B", and the carriage is now rocked rearwardly until the flange 40 engages the exposed pages. Then the index notch for the letter "B" is cut. This sequence of operations is repeated until the entire book has been provided with index notches.

It should be noted that in the ordinary case the thickness of the pages for the first three letters will ordinarily be so small that the path of the cutter blade 44 will intersect the cutter block 14. It is therefore to be expected that there will be perhaps three or four notches formed in the cutter block at the extreme left thereof. As the thickness of the pages beneath the flange 40 increases, the path of the cutting edge is lifted out of engagement with the cutter block.

The function of the flange 40 should not be overlooked. While the bound rear edge of the book or directory is held firmly by the plate 76, it is also necessary in order to produce a smooth accurately cut notch to clamp the free edges at the station where the cutting is taking place. It will be observed that the flange 40 admirably serves the purpose. As the thickness of the pages being cut gradually increases, the cross piece 26 rises, the arms 22 pivoting at the rear of the machine. The degree of rotation of the carriage and barrel 38 is determined by the thickness of the pages on the bed plate, the combined result being that the flange 40 always lies flat upon the exposed pages during the cutting operation. Furthermore pressure exerted on the knob of the cutter also serves to press the flange 40 into firm clamping engagement with the exposed pages, thus steadying the free edges of the pages during the cutting operation. As soon as pressure is released from the knob of the cutter the clamping pressure is also simultaneously released, the result being that the flange 40 is caused to serve as an automatic clamp, coming into play precisely when needed.

After the book has been provided with the notches a rubber stamp or similar instrumentality may be used to mark the appropriate letters at the bottom of each notch, or a sticker may be applied in accordance with customary practice.

Although in the embodiment illustrated herein the machine is shown as adapted to take only one size of book, it will readily be apparent that there are obvious expedients which may be resorted to to provide adjustment. For example, the arms 22 may be made in telescoping sections and the cutter block 14 mounted on a carriage arranged for adjustable sliding movement within the frame 10.

Having thus disclosed my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. An index-cutting machine comprising a support, a book clamp mounted on said support, a bracket pivotally mounted upon said support for movement toward and away from said support, a carriage pivotally mounted on said bracket and slidable to traverse one edge of a book held in said clamp, said carriage likewise being mounted for movement toward and away from said support, a portion of said carriage being adapted to engage an exposed flat surface of a book so held, and a cutter mounted on said carriage for reciprocation through a path intersecting the margin of a book held in said clamp.

2. An index-cutting machine comprising a support, a book clamp mounted on said support, a bracket pivotally mounted upon said support, for movement toward and away from said support, a carriage pivotally mounted on said bracket and slidable to traverse one edge of a book held in said clamp, said carriage likewise being mounted

for movement toward and away from said support, means on said bracket for releasably securing said carriage against sliding movement from a predetermined cutting station, and a cutter mounted on said carriage for reciprocation through a path intersecting the margin of a book held in said clamp.

3. An index-cutting machine comprising a support, a book clamp mounted on said support, a bracket pivotally mounted upon said support for movement toward and away from said support, a shaft carried by said bracket, a carriage pivotally and slidably mounted on said shaft, a plurality of teeth forming notches adjacent said shaft, a finger upon said carriage for pivotal movement therewith in and out of engagement with said notches, said carriage likewise being mounted for movement toward and away from said support, and a cutter mounted on said carriage for reciprocation through a path intersecting the margin of a book held in said clamp.

4. An index-cutting machine comprising a frame, a book clamp mounted upon said frame, a bracket pivotally mounted on said frame for movement toward and away from said frame, a

carriage slidably and pivotally mounted on said bracket in position to traverse one edge of a book held in said clamp, said carriage likewise being mounted for movement toward and away from said frame, a cutter mounted for reciprocation upon said carriage through a path intersecting marginal portions of a book held in said clamp, and a member disposed on said carriage and having a flat surface adapted to be swung into engagement with the exposed pages of a book supported on the frame and underlying said carriage.

CURTIS D. CHASE.

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