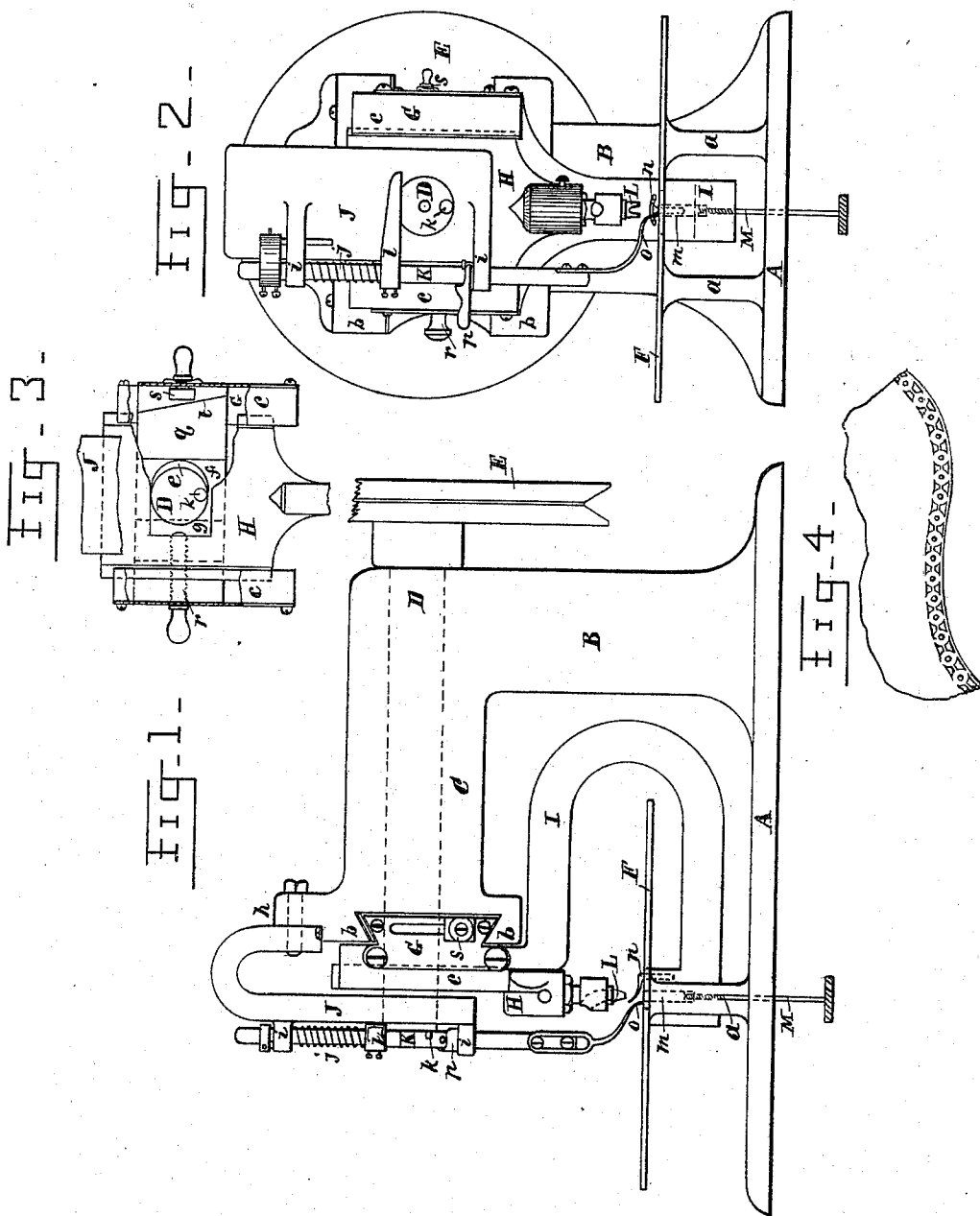


(No Model.)

B. F. HALL.
PUNCHING MACHINE.

No. 535,898.

Patented Mar. 19, 1895.



WITNESSES:
Frederick W. Carder
W. W. Carder

INVENTOR:
Benjamin F. Hall
per Edw. Summer, Atty.

UNITED STATES PATENT OFFICE.

BENJAMIN F. HALL, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR OF
ONE-HALF TO DODGE BROTHERS, OF SAME PLACE.

PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 535,898, dated March 19, 1895.

Application filed November 22, 1894. Serial No. 529,628. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. HALL, a citizen of the United States, residing at Newburyport, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Punching-Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to machines for making perforations, particularly those of an ornamental shape in leather for the uppers of boots and shoes.

The object of my invention is such construction, especially with reference to the combination and operation of die, die-plate, guide and presser-foot, that there will result a symmetrical arrangement of said perforations whether they are to be formed in the direction of a straight or a curved line, the invention consisting in the devices and combinations of devices hereinafter set forth and specifically pointed out in the claims.

In the drawings Figure 1 is a side-elevation, and Fig. 2 a front elevation, of a punching machine embodying my invention. Fig. 3 shows certain details. Fig. 4 illustrates the work of the machine.

The combination and arrangement of bed-plate A, support B and arm C, shaft D having bearings in said arm, pulley E by which said shaft is revolved, and circular table F supported by legs *a* secured to said bed-plate, will be readily understood from the drawings without further description.

On the front face of the arm C are guides *b* for a horizontally sliding carriage G. On the front face of this carriage are guides *c* for a block H to slide thereon vertically. To the carriage G is rigidly secured an arm I, bent as shown so as to make room for the articles to be operated upon, and to extend under the table F. On the shaft D is a cam or eccentric *e* which is sufficiently broad to engage with both the carriage G and the block H, there being an opening *f* in the carriage and an opening *g* in the block therefor. The opening *f* is such that the cam *e* will meet the vertical walls thereof so as to move the carriage G forward and backward horizontally. The opening *g* is such that the cam will meet upper and

lower planes of the block and thus cause the block H to move up and down on the carriage. To the stationary arm C is secured at *h* an extension J on which are projections *i* in which slide a vertical rod K, pressed downward by a spring *j*. A pin or projection *k* on the end of the shaft D will engage with a projection *l* on the rod so as to raise this rod as required.

To the block H is secured the die L (in a suitable holder therefor), being of form and construction to make the desired perforations. A die-plate *m*, preferably of cylindrical form, is held in a socket in the lower end of the arm I and is adjustable by means of a screw M which may be screwed in this arm to raise or lower the die-plate. To this arm I is also secured a gage *n* which is met by the edge of the article to be perforated and guided thereby. To the rod K is secured a presser-foot *o* which is to press at suitable intervals on the article when in position on the table. This presser-foot is formed so as to end in a blunt point or have the surface thereof which presses on the article to be perforated of such shape that said article may be swiveled when pressed onto the table F thereby.

In operation, the article to be perforated being placed on the table *f* in suitable position and so that the edge thereof will meet the gage *n*, and the presser-foot being allowed to drop onto the article by means of the spring *j* (a lever and cam *p* being swung for that purpose), on rotation of the shaft *d* the cam or eccentric *e* will first press the block H downward so as to cause the die to meet the die-plate thus making a perforation in the article, and will then move the carriage G so as to cause the die, die-plate and gage *n* to move forward (there being an opening in the table F sufficient for this movement), thus feeding the article by moving it a sufficient distance for the next perforation. During this operation the presser-foot has been lifted by means of the pin *k* in contact with the projection *l*. After the pin *k* has allowed the presser-foot to drop onto the article, the cam *e* will raise the die by sliding the block H upward, and will thereupon move the carriage G backward carrying the die and die-plate into position to make another perforation. It should be

particularly noticed that the gage *n* moves with the die and die-plate in their backward as well as forward motion, and that the presser foot *o* is pressed onto the article during this backward movement of the die, die-plate and gage, so that the gage will be carried so as to slide backward along the edge of the article while the latter is held pressed onto the table. The presser-foot being of such pressing surface that the article may swivel thereunder, the gage may continue in contact with the edge of the article although this edge is curved. Since the article is so held that it may swivel, the gage may closely follow the edge of the article when the edge is curved in either of the directions shown in Fig. 4. Therefore these perforations will have a symmetrical arrangement with reference to each other and the edge of the article. Such a result cannot be obtained in a machine in which the gage is stationary.

For the purposes of adjustment as to distances between the perforations I have the walls, against which the cam *e* presses to slide the carriage *G*, a part of a piece *q* movable horizontally in said carriage. The distance of movement of this piece in the carriage may be determined by means of a screw *r* screwing into said piece and having a shoulder to meet the side of the carriage. The distance of movement of said piece in the other direction is determined by means of a stop *s* which may be slid up or down in the carriage so as to meet the piece *q* at any desired part of the inclined side *t* thereof.

If the perforations are to be in a straight line the distance apart being determined by means of the screw *r*, the stop *s* is set opposite the middle of the incline *t*. On changing from a straight line to an outwardly or inwardly curving line the stop will be moved so as to allow a greater or less travel of the carriage. Thus the perforations may be made of equal distance apart whatever be their direction, while being, also, symmetrical as and by the means above specified.

I claim as my invention—

1. The combination of a die-holder, a block to which said holder is secured, a carriage on

which said block is mounted, mechanism for moving said carriage forward and backward, and for moving said block up and down, a die-plate and gage secured to said carriage to move therewith, a presser-foot movable up and down in stationary bearings, and provided with a blunt point or bearing surface whereby the article may be swiveled when pressed thereby and means for causing said movement of the presser-foot at suitable intervals, substantially as set forth.

2. The combination of a horizontal shaft to revolve in stationary bearings, a cam on said shaft, a carriage to be reciprocated by said cam on stationary horizontal guides, a block to be reciprocated vertically by said cam and mounted on said carriage, a die-holder secured to said block, a die-plate and a gage secured to said carriage, a table on which the article to be punched is placed and moved, a presser-foot movable vertically in stationary bearings, and provided with a blunt point or bearing surface whereby the article may be swiveled when pressed thereby and a projection on said shaft to raise said presser-foot, as required, substantially as specified.

3. The combination of a horizontal, revolvable shaft and stationary bearings therefor, a cam on said shaft, a carriage to be moved horizontally forward and backward by said cam, stationary guides for said carriage, adjustable bearings on said carriage to be met by said cam, a block having bearings for said cam and mounted on said carriage provided with vertical guides therefor, a die removably secured to said carriage, a die-plate adjustably secured to said carriage, a gage secured to said carriage, a presser-foot provided with such bearing surface to press on the article to be operated upon that said article may be swiveled when so pressed, stationary bearings providing for vertical movement of said presser-foot, a spring to move the presser-foot downward, and a projection on said shaft to raise the presser-foot, substantially as described.

BENJAMIN F. HALL.

Witnesses:

P. GILLISS TULOSS,
H. E. NUTTER.