E. S. STILES.

METHOD OF CUTTING BLANKS.

APPLICATION FILED JUNE 12, 1908.

927,293. Patented July 6, 1909.

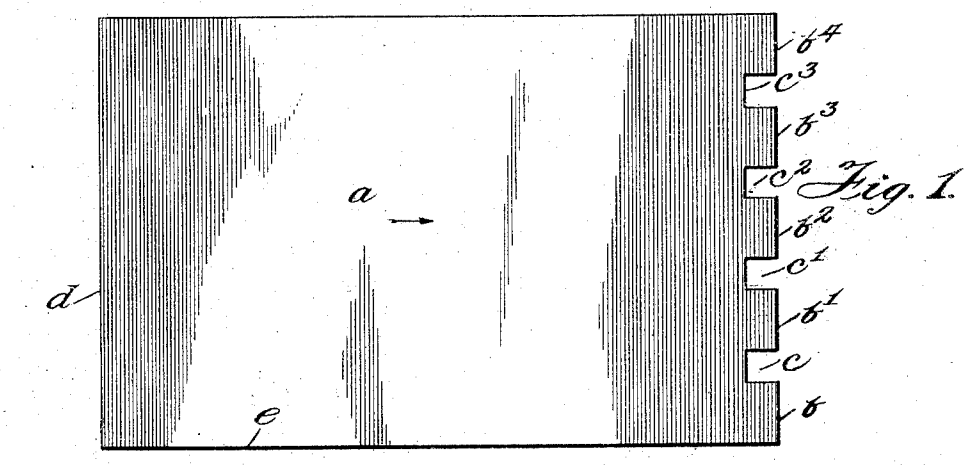


Fig. 1.

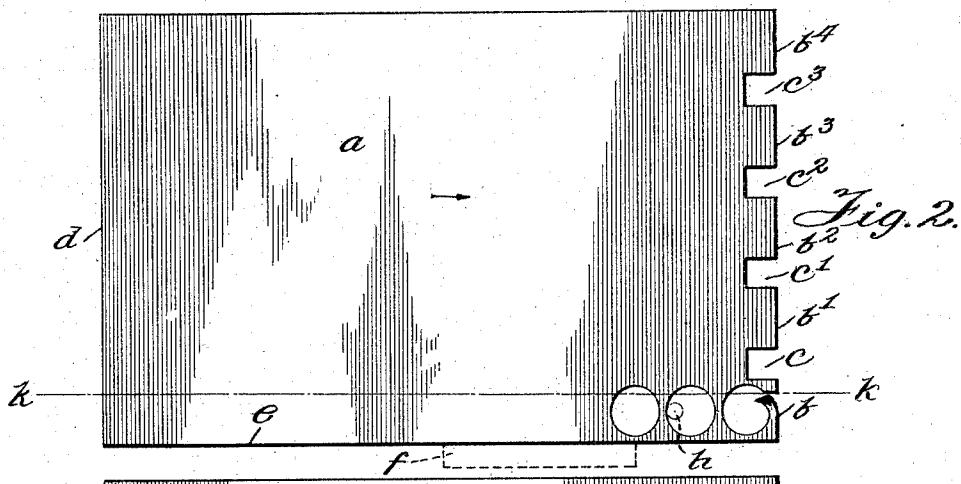


Fig. 2.

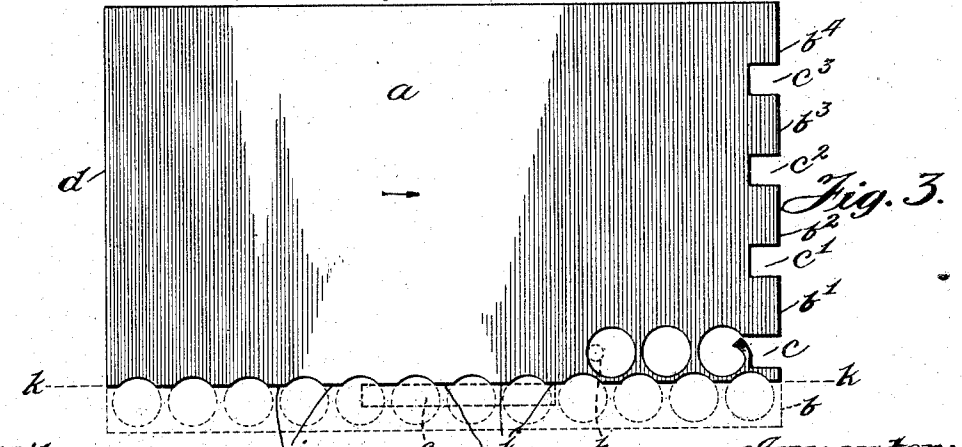


Fig. 3.

Witnesses:

E. A. Parry

U. P. Kilroy

Inventor:

Edmund S. Stiles

By Cheever & Cox

Attys.

ANDREW. B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDMUND S. STILES, OF RIVERSIDE, ILLINOIS.

METHOD OF CUTTING BLANKS.

No. 927,293. Specification of Letters Patent. Patented July 6, 1909.

Application filed June 12, 1908. Serial No. 438,134.

To all whom it may concern:

Be it known that I, EDMUND S. STILES, a citizen of the United States, residing at Riverside, in the county of Cook and State of Illinois, have invented a certain new and useful Method of Cutting Blanks, of which the following is a specification.

My invention is adapted primarily to the cutting of substantially circular blanks from sheets of metal, strawboard, fiber or other material employed for the manufacture of the ends or covers of cans and similar containers.

The object of the invention is to provide a method by which the blanks may be obtained with the greatest rapidity and greatest economy of material where the feeding is done by hand and the blanks are produced one at a time.

To facilitate description of my method I will refer to the accompanying drawings, in which:

Figure 1 represents the sheet after the first step in the process has been completed. Fig. 2 represents the sheet during the second and final step in the process after three blanks have been cut and Fig. 3 represents a sheet after the entire sheet has been once subjected to the process and said second step is in the course of repetition.

It is well known of course that a greater number of circular blanks may be produced from a given sheet of material if the blanks be staggered than if they be arranged in rows extending at right angles to each other. This principle has been recognized in gang punches which are usually arranged with the punches staggered. But for different reasons, in much of the present day manufacture the blanks are punched one at a time in rows and the feeding is done by hand. Under such circumstances the second row of apertures from which the blanks are produced usually bear an indefinite relationship to the first row of apertures; and sometimes in the trade the process is facilitated by employing narrow sheets or strips just wide enough to produce two rows of blanks, the proper guiding of the strip being accomplished by reversing the strip end for end after the first row of apertures has been cut, thus using for each row the smooth edge of the strip, which may travel along the side guide of the machine.

The spacing between any two apertures in a row is effected by always feeding the strip forward until the edge of the last aperture contacts the gage or stop which is always provided in single acting hand fed punching machines. For various reasons, however, (among them waste of material in making round holes fit rectangular sheets, and the necessity for reversal of the sheet where side guides are employed,) the employment of narrow strips of material from which only two rows of blanks can be cut has disadvantages which are eliminated by my method; for as the result of this method, not only may wide sheets of material be employed, but the necessity for reversing the sheet is eliminated and the apertures are located accurately and rapidly without especial care on the part of the operator. The method by which these desiderata are accomplished is as follows: A sheet of metal, strawboard, fiber or other material from which the blanks are to be produced, is procured of a width capable of furnishing several, preferably eight or nine, rows of blanks. This sheet, represented by *a* in each of the figures, is then cut in such a manner as to form gage-abutting edges *b*, b^1, b^2, etc. having located between them other gage-abutting edges *c*, c^1, c^2, etc. These edges are located at a distance apart less than the diameter of the blanks to be produced, the amount depending upon what margin may be safely left under the conditions of manufacture. Considered in the direction of feed, the different gage-abutting edges differ from the ones on either side of them by one half the feeding distance. This feeding distance is equal to the diameter of the blank plus the scrap which the manufacturer decides to leave for safety under the circumstances and conditions of manufacture. After the sheets are thus prepared, the operator, standing usually behind the sheet at the edge *d* thereof, places the sheet with its right edge *e* in contact with the side guide *f* and the forward gage abutting-edge *b* in contact with the feeding gage or stop *h*. After the punch has descended and removed a blank the operator advances the sheet until the inner edge of the resulting aperture contacts gage *h*. This process is repeated until the entire row of apertures has been formed. During the punching of the first row of apertures the sheet is automatically sheared by the punch press along the line *k*—*k* Fig. 2, the shear lagging behind the punch about one or two holes as indicated in Fig. 2. As the shearing action thus lags slightly behind the punching

action it will of course be necessary for the operator to feed the sheet a short distance farther after the punch has finished with it in order that the shear may complete the cutting of the sheet, and form a new guiding edge for the side guide *f*. This line of cut *k*—*k* passes through the apertures from which the blanks have been removed and consequently the new cutting edge is serrated. These serrations or teeth *j* are, in a sense, the source from which the saving is made possible, because as the next gage-abutting edge *c* is advanced one half the feeding distance the new aperture comes between two adjacent apertures of a preceding row.

After the first row of blanks have been removed and the new guiding edge *k*—*k* formed in a manner thus described, the second step in the process is again repeated, the serrations *j* slipping along the side of the gage *f* in the manner indicated in Fig. 3. The operation is repeated over and over until the entire sheet has been consumed. By proceeding in this manner there is practically no waste material except such amount of scrap as is practically always necessary even when a gang punch is employed. The sheet need never be reversed and the successive punching operations may take place in rapid succession without requiring great skill on the part of the operator and without running the risk of having the apertures inaccurately placed. This, it will be remembered, is accomplished in a process in which not only is the feeding done by hand but the stamping is done one blank at a time.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The method of producing substantially circular blanks from sheets of metal or other material consisting in first preparing a sheet by forming gage-abutting edges differing each from the next by one half the feeding distance; said edges being located at a distance apart less than the diameter of the blank to be cut; then punching a row of blanks one at a time, and simultaneously cutting the sheet upon a line parallel to the direction of feed to form a new guiding edge, said line passing through the apertures formed by the removal of the first row of blanks, substantially as described.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

EDMUND S. STILES.

Witnesses:

HOWARD M. COX,

C. J. CHRISTOFFEL.