

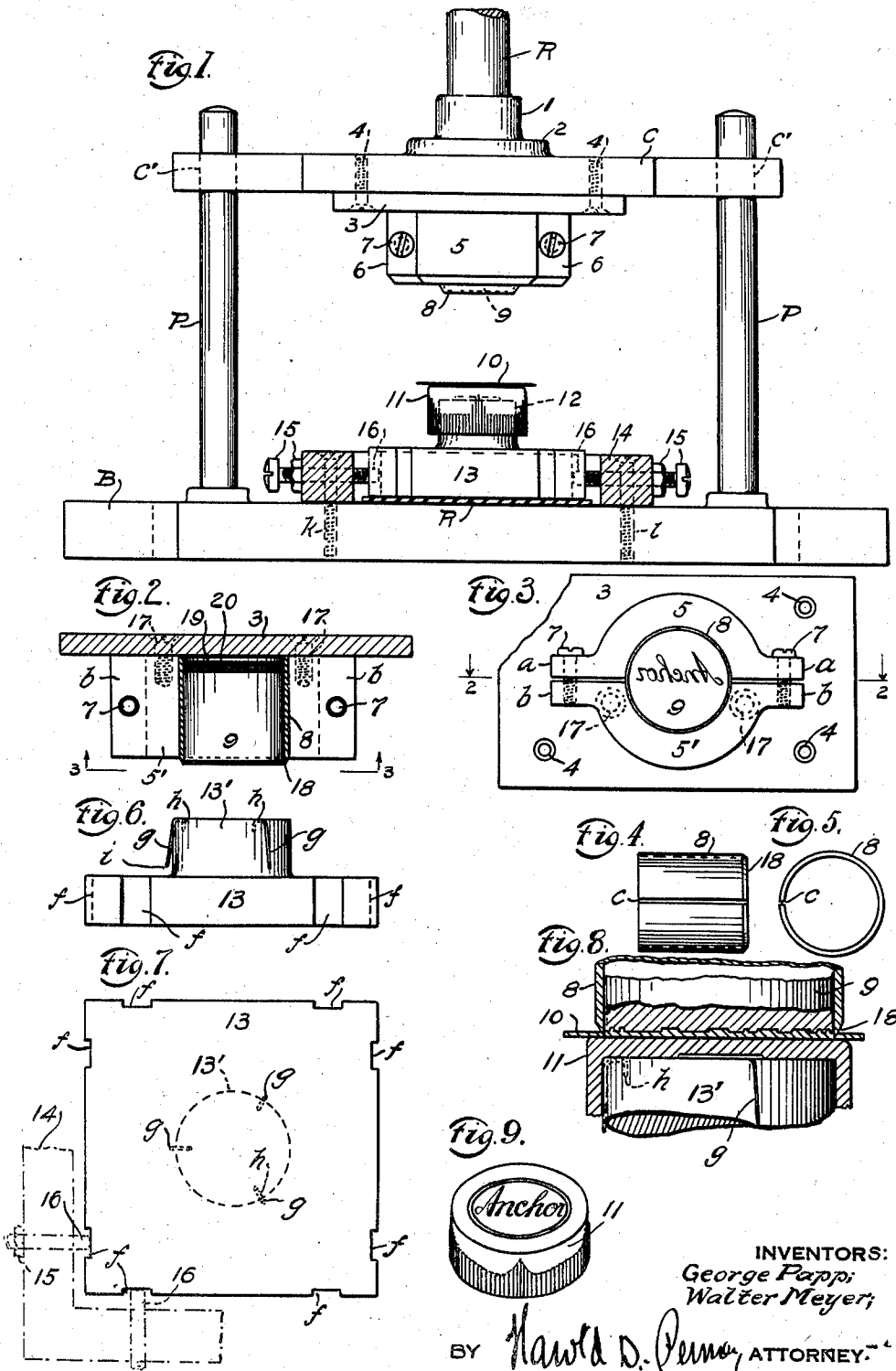
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G. PAPP ET AL

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APPARATUS FOR CUTTING, EMBOSSING, AND ADHERING LABELS

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INVENTORS:
George Papp;
Walter Meyer;

BY *Harold D. Penn*, ATTORNEY.

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APPARATUS FOR CUTTING, EMBOSSING,
AND ADHERING LABELS

George Papp, Maspeth, N. Y., and Walter Meyer,
Princeton, N. J., assignors to Peters Brothers
Rubber Company, Inc., Brooklyn, N. Y., a cor-
poration of New York

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The present invention relates to an improved method, and apparatus, for die cutting, embossing and adhering labels of foil or metallized paper to various articles, the three noted steps being performed in a certain sequence, but being substantially a simultaneous operation.

The present illustrated use, is in the application of embossed and cut metallized labels to screw caps for bottles, the labels being cut from a roll-strip of material such as is set forth in U. S. Patent No. 2,043,809, patented June 9, 1936, for Improvements in method of making cut embossed stock sheets and article of manufacture, in the name of George Papp.

The metallized paper set forth in said patent has been found to be especially adapted to the mode of application of labels as herein outlined.

A further feature of the present improvement is in the elimination of the bottom or male embossing die, only the upper intaglio-cut embossing die being used, and the elimination of a make-ready matrix, where this is used instead of the bottom male die.

Another feature of advantage is in the provision of means whereby the work holder or cap holder is provided with a work centering device, and is also resiliently and self adjustably mounted to the bolster of the press, while the cutting and embossing die, carried on the reciprocating ram of the press, is immovably fixed thereto.

The foregoing advantages, and the further features of advantage relating to the cutting die, the mode of adjustably mounting the embossing die within the cylindrical cutting die and holding the cutting and embossing die in operative relation and other appurtenant features will appear as the herein description proceeds and it is obvious that alterations may be made in the structure herein without departing from the spirit hereof or the scope of the appended claims.

In the drawing, Fig. 1 is a front view, in elevation, of the assembled cutting and embossing device as it would be mounted in a vertical operating press, showing portions of the press, such as are well known in this art, with a section of the retaining ring of the work holding means being shown in section; Fig. 2 is an enlarged section of the cutting and embossing die, removed from its holder, taken on the line 2—2, Fig. 3, looking in the direction of the arrows; Fig. 3 is an enlarged plan view of the cutting and embossing die, looking in the direction of the arrows 3—3, Fig. 2; Figs. 4 and 5 are side and end elevations of the cutter removed from its operative position; Figs. 6 and 7 are side and bot-

tom views, respectively, of the floating work holding means, removed from the retaining ring; Fig. 8 is an enlarged fragmentary view of the cutter, embossing die, bottle cap and work holding means, in the act of cutting and embossing a label upon the cap, this view being partly in transverse section, to better illustrate the coacting structures and Fig. 9 is a perspective view of a characteristic bottle cap with a label applied.

In Fig. 1, the press, not shown, but well known in this art as a punch or stamping press, is represented by a bolster B, upon which is normally mounted one of the cooperating dies, and which bolster is customarily fixed by headed bolts and registering pins to the bed plate of the press, or it may be integral with the press.

Upon the bolster is mounted, besides the bottom or work holding assembly, two spaced apart upright pilots or spindles P, these being located firmly and accurately, to guide the reciprocating head assembly 1, 2, R and C, in accurate alignment with the member 12. The head bolster C is provided with fitted bores C' at its opposed ends, to accurately and slidably fit the pilots P. The head bolster C may include the reciprocable press plunger R suitably affixed in the integral flanged boss 1—2 of head bolster C. This structure, in detail, may be varied in different presses.

To the bottom or under face of head bolster C is affixed by countersunk head screws 4—4, Fig. 1, a die plate, generally denoted by 3, see also Fig. 3, and while, in the present instance it is shown to be of rectangular contour, it may be of any desired form.

Mounted upon the die plate 3, by counter sunk head screws 17—17 is a relatively fixed half circular section of a cutter and embossing die clamp 5', and a duplicate half circular clamp member 5 is removably and adjustably affixed, by headed screws 7—7 to the fixed die clamp 5'. The clamps 5 and 5' are provided with parallel end flanges or extensions a and b on opposite ends thereof whereby the screws 7—7 may draw the clamp 5 tightly to fixed clamp 5' and thus operatively and firmly grip the circular cutter-embossing die assembly therebetween.

As in Figs. 4 and 5, the cutter 8 is made up of a rolled cylindrical piece of sheet tool steel, rolled from the flat, hardened and accurately ground to size and cutting edge. This leaves the cutter with a longitudinal opening c, the cutter having a square rear end and a chamfered cutting edge. The cutter is thus resilient so that it may be clamped firmly about the embossing die 9.

The embossing die 9 has its front or die end engraved, in intaglio, with the desired symbol and ornamentation sunk therein, such as the reversed word "anchor", Fig. 3.

As in Fig. 8, the cutting edge 18 of the cutter 8 is slightly advanced beyond the face of the embossing die 9, so that as the cutting edge enters the label stock 10, it starts cutting in slight advance of the contact of the die face with the label stock, and upon completion of the operation the tissue on the back of the label is deformed, plastically to flow up into the sinking on the die face and flattened at other places, to be explained more in detail, later.

To accomplish the accurate setting of the cutter edge 18, in advance of the face of the embossing die 9, and as in Fig. 2 the rear end of the embossing die is packed with a selected plurality of metallic shims, most of them, as at 19, being only a few thousandths of an inch thick, the upper or last shim 20 being about one thirty-second of an inch thick, forming a base shim, which cannot slip through the crack formed between the back flat edge of the cutter 8 and the face of die plate 4, with which it contacts.

Sufficient shims 19 are introduced to pack up the cutting edge 18 of cutter 8, to enable it to cut the label cleanly, and to fully emboss the label, without deforming or breaking the cap 11, which may be of friable material, or it may be metallic or non-metallic. The top of the cap forms the lower platen for the reception of the cutting and embossing pressures upon the label, and to which top the label finally adheres, as in Fig. 9.

In order to cause the tissue backing of the label to become plastic and act as its own make-ready the top bolster C and its mounted cutting and embossing die, are heated constantly, at a controlled temperature, by being mounted upon either an electric heater, or a steam heated platen, which forms of structure are well known in this art, are not shown and need not be further described.

Once the upper die 9 and its die assembly become heated, the triple operation of cutting, embossing and adhering may be carried on as fast as the press can operate.

The lower assembly upon bolster B is constructed as follows: a retaining ring 14, Fig. 1, in the present instance of rectangular form, though not so limited, is firmly affixed to the top surface of the bolster B by countersunk head screws k and l. This retaining ring is located to the approximate operative position of the work holding boss.

The work holding means comprises a bed plate 13 of rectangular outline, of somewhat smaller dimensions than the ring 14, and has, preferably integral therewith, a bottle cap holding and registering boss 13', the contour of which approximates the inside contour of the bottle cap 11, as at Fig. 8.

The bed plate 13, as in Fig. 7, has provided, on its edges, a plurality of vertically cut notches or kerfs f, these being located symmetrically to each other and adjacent the corners of the bed plate 13.

In the retaining ring 14, as indicated in full lines in Fig. 1 and in dotted lines in Fig. 7, there are located a plurality of lockable set screw assemblies 15, one for each vertical kerf f, and the inner flat ends of the screws 15 as at 16, Figs. 1 and 7, are so adjusted as to allow a slight amount of freedom between the ends 16 and the bottom faces of the kerfs f, such clearances all around

providing for an upward floating movement of the bed plate 13, but still holding it, with great accuracy, to register with the upper cutting and embossing die. Underneath the bed plate and resting upon the bolster B is a thin, rubber pad R, which exerts sufficient resistance to the operative pressure by the cutting and embossing die upon the work holding means to accomplish a clean cutting and embossing operation upon the bottle cap, without deformation or injury to the cap. Thus the cushion construction just described permits of a slight reciprocal movement of the work holding plate and boss.

As the bottle caps, whether molded from a plastic, or stamped from sheet metal, vary in dimensions, slightly, it has been found desirable to provide the cap holding boss 13' with a resilient cap positioning device, and as shown in Fig. 6, this comprises a plurality of spring tongues g extending downwardly from the top of the boss 13', and slightly divergent at their lower free ends i. The mode of mounting these cap centering devices is indicated in dotted lines at h, Figs. 6 and 8, wherein the upper ends of the springs are downwardly bent U-shaped, the short end of the U being fixedly mounted in a hole and connecting groove suitably provided in the top surface of the boss 13', so that the connecting ends of springs are flush with the top surface of the boss 13'.

The operation of the device is as follows:

During the intermittent strokes of the press, and in the customary manner, and after the cutting and embossing die 9 has been properly heated, the operator places a bottle cap on the boss 13', where it is centered by the springs g, which also take up any slackness due to variations of diameter of the cap. The metallized paper 10 being in position with its adhesive face towards the cap top, the cutting and embossing die then comes down and cuts and embosses the strip of metallized and coated paper, and as previously described, causes the cut label to adhere to the cap. As the cutting and embossing die returns on its up-stroke, an unlabelled cap is substituted for the labelled cap.

As thus described, it is obvious that by the use of the herein described device the triple operation of cutting, embossing and adhering of a label upon a hard article is accomplished, using the flat surface of the article, without cooperating make-ready or design, to act with a single, intaglio cut embossing die and the plasticity of the adherent on the foil or paper, to develop a fully embossed symbol, sequentially with the cutting, heating and adhering operation.

The laminated embossing sheet may be fed to the cap labelling position, either in small blanks, or may be fed in a strip from a roll as the labels are cut, embossed and adhered to the caps.

From the foregoing it will be obvious that other kinds of embossing sheet stock may be substituted for the herein disclosed metallized sheet stock, in which the material to be cut, embossed and adhered, as a label, may have all of the functions of the metallized sheet stock but be without the foil face.

Having thus described the invention, what is claimed is:

1. In combination, a work holding means adapted to hold an article to be embossed and comprising with a bolster and a fixed retaining ring, a bed plate adjustably and resiliently held for vertical movement in said retaining ring, an article holding means upon said bed plate, means

on said article holding means for resiliently centering the article on said holding means and means on said ring for adjustably locating said bed plate.

2. A die apparatus for a labelling machine including a base having a work holding device and guide means rising therefrom; comprising a cross head movably mounted on said means; clamping means having one section fixedly carried by said head; an embossing member including a working face, a cutting member embracing the first member and having an edge around said face; and a second section removably cooperating with the first section and clamping said members together.

3. A die apparatus for a labelling machine having a work holding base and guide means rising therefrom; comprising a cross head reciprocally mounted on said means; an embossing member having a cutting member disposed therearound and adjustable thereon, and means attaching said members to the cross head and releasably holding them together.

4. An embossing mechanism comprising in combination with a vertically reciprocable die member and a base; a bed plate arranged for vertical movement on the base and having a work holding member rigid therewith; means fixed to said base and disposed around said plate, and adjustable means carried by said fixed means for moving said plate horizontally.

5. An embossing mechanism comprising in combination with a vertically reciprocable die member and a base; a bed plate arranged for limited vertical movement on the base, there being cushioning means below the plate, said plate having a work holding member rigid therewith; means fixedly carried by said base, and adjustable means carried by said fixed means for moving said plate horizontally whereby to align said members.

6. In combination, a vertically reciprocable cutting and embossing die; a base; work holding means disposed on said base and having limited horizontal and vertical movements; means mounted on said base for guiding the work holding means vertically, and means including said guiding means for moving the work holding means horizontally.

7. An apparatus including in combination a base having vertical guide members rising therefrom, a cross head reciprocally mounted on said members and having a cutting and embossing die mounted thereon; work holding means disposed on said base and having limited horizon-

tal and vertical movements; and means fixedly mounted on said base and having thereon adjustable elements for guiding the work holding means in its vertical movement, said elements adapted also for adjustment to move said work holding means horizontally.

8. A labelling and embossing device for bottle caps comprising in combination a base having vertical guide members rising therefrom, a cross head reciprocally mounted on said members and having rigid therewith a cutting and embossing die; a bed plate movably disposed on the base and having mounted thereon a holder for a cap, the latter being adapted to have placed thereon labelling and embossing stock; and means for moving said plate and its mounting whereby the cap may be aligned vertically under said die.

9. A labelling and embossing device for bottle caps comprising in combination a base having vertical guide members rising therefrom, a cross head reciprocally mounted on said members and having rigid therewith a cutting and embossing die; a bed plate disposed on said base and having limited vertical movement, there being resilient means below the plate, said plate having also limited horizontal movement; a headed cap holder fixedly mounted on the plate; means rigid with said base around the plate and having therein adjustable element so as to form a guide for the plate in its vertical movement; said holder having thereon contractile and expansible spring means so as to grip the band of a cap; and means including said elements for adjustably moving said plate and its mounting horizontally.

10. An apparatus for producing labelled and embossed bottle caps comprising cap holding means including a support for engaging the inner face of the top of a plain cap, relatively movable means including a die element for embossing a design on a labelling strip, the strip being placed on said top, and a cutting element surrounding the die element so that as the latter forms the design the strip portion therearound may be cut so as to force the edge thereof into the material of said cap in attaching relation therewith.

11. In a labelling and embossing apparatus for bottle caps having vertically reciprocable means for cutting a disc from sheet material and for embossing the disc; a frame including a base, and whereon said means are reciprocable; a cap holding member carried by said base, and spring means mounted on said member and having free parts for centering a cap thereon.

GEORGE PAPP.

WALTER MEYER