Feb. 26, 1957 M. E. GAZETTE 2,782,851

DIE CUTTING AND CREASING MACHINE AND METHOD OF MAKING

Filed Oct. 20, 1953

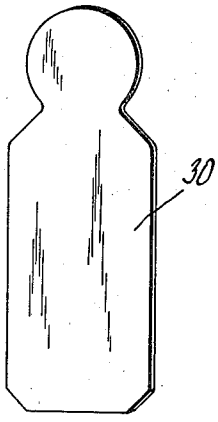


Fig. 1.

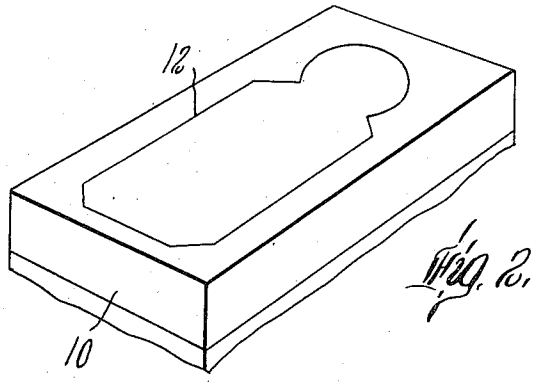


Fig. 2.

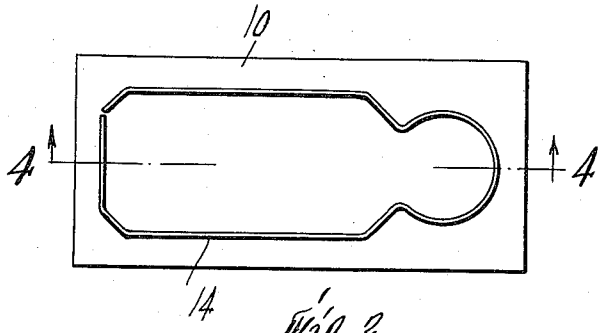


Fig. 3.

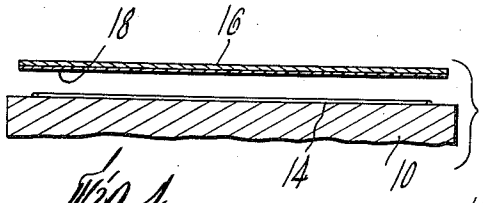


Fig. 4.

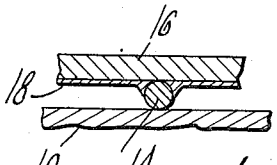


Fig. 5.

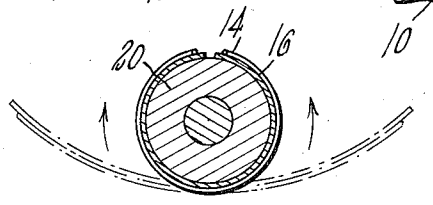


Fig. 6.

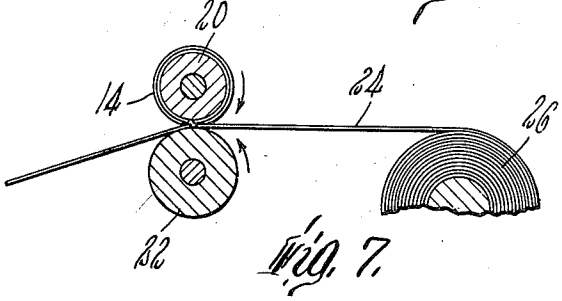


Fig. 7.

Inventor
Marshall E. Gazette
by Wright, Brown, Quinby & May
Attys.

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DIE CUTTING AND CREASING MACHINE AND METHOD OF MAKING

Marshall E. Gazette, Weymouth, Mass.

Application October 20, 1953, Serial No. 387,277

4 Claims. (Cl. 164—30.5)

This invention relates to a machine for die cutting or creasing paper and the like, and to a method of making such a machine. Heretofore the cutting and creasing of paper in making tags, cardboard boxes and the like has customarily been done by the use of rule die stock as the cutting elements mounted either on rolls or flat beds. According to the present invention, fine wire or hard material having a circular cross-section is employed for the cutting elements and is mounted on the surface of a cylindrical roll. The wire may be soldered to the surface of a hard metal roll or may be soldered or otherwise secured to a thin sheet of metal which is wrapped around a roll to become virtually a part thereof.

It is an object of the invention to produce a rotary cutter or creaser which will cost relatively little to construct but which will be effective in operation. According to the invention, machines can easily and cheaply be made to cut out any desired shapes from paper sheets, or to impress crease lines of any desired configuration. For this purpose a fine wire of hard metal is bent to the shape of the cut or crease desired and is sweated to the surface of a thin flexible steel strip. The strip is then wrapped around a cylindrical roll, the strip being of such a size that its ends abut each other when the strip is wrapped around the roll. The strip is secured to the surface of the roll which is thereupon mounted in contact with an anvil roll, both rolls being rotatable. Paper to be cut or creased is then passed between the rolls and is cut or creased in accordance with the pattern of the wire on the cutter roll. If the anvil roll is hard, the other roll cuts the paper. If the anvil roll is slightly yielding, creasing results.

For a more complete understanding of the invention reference may be had to the following description thereof and to the drawing of which—

Figure 1 is a view of a sample paper article cut from a paper sheet;

Figure 2 is a perspective view of a magnetic bed block used in constructing a machine according to the invention;

Figure 3 is a plan view of the block shown in Figure 2, with a bent wire cutting element thereon;

Figure 4 is a section on the line 4—4 of Figure 3, showing also a thin metal sheet above the block;

Figure 5 is a fragmentary magnified sectional view of the block, wire and sheet shown in Figure 4;

Figure 6 is a sectional view of a roll with a cutter sheet mounted thereon; and

Figure 7 is a diagrammatic view of the cutter in operation.

In making a die cutting roll embodying the present invention a magnetic bed block **10** is employed, this block being made of highly magnetizable material which

is strongly magnetized so that the top face is of the same polarity throughout. On this face may be marked, if desired, an outline **12** indicating the shape to which a piece of wire is to be bent. A piece of wire **14** is bent by any suitable means to the plane shape indicated by the outline **12** and is placed upon the top face of the magnetized block **10**. The wire is preferably of ferro-magnetic material such as steel piano wire. The magnetic force of the block **10** holds the wire **14** against the top face of the block. A thin strip or sheet **16** of flexible material such as hardened steel is then placed on the wire **14**. This strip or sheet has on its lower surface a coating **18** of solder or other suitable thermo-plastic adhesive material. The sheet **16** is pressed upon the wire **14** and is heated while so pressed so that the solder **18** melts sufficiently to sweat the wire **14** to the bottom face of the sheet **16** as indicated in Figure 5. The sheet is then cooled to solidify the solder whereby the wire **14** is securely attached to a face thereof. The sheet with the wire attached is then wrapped around the circumferential surface of a hard roll **20** as indicated in Figure 6 with the wired side out and is secured thereto by any suitable means. The sheet **16** is of such size as to cover the cylindrical surface of the roll, the end edges of the sheet substantially abutting each other. The roll may then be mounted in a suitable frame (not shown) to press strongly against an anvil roll **22**. These rolls are rotated in opposite directions so that when a paper sheet from a supply roll **26** is introduced between the rolls **20** and **22**, the design defined by the bent wire **14** cuts the paper sheet **24** so as to form the separate pieces having an outline similar to that of the wire shape on the plate **16**. If a creasing instead of a cutting operation is required for the paper sheet **24**, the anvil roll **22** is made with a surface which is sufficiently yielding to prevent the wire **14** from cutting through the paper. For this purpose the roll **22** may be made with a surface of masonite, bakelite or equivalent material having slightly yielding characteristics.

The bent wire shown in Figure 3 is designed to cut out tags from the paper sheet **24**, one such tag **30** being shown in Figure 1 by way of example. Any desired shape may be cut from the paper sheet by bending the wire **14** to such desired shape.

I claim:

1. In a machine for cutting or creasing paper sheets, a cylindrical roll of hard material, and a thin sheet wrapped around and removably secured to said cylinder, said sheet having a cutting element secured to its surface consisting of a wire of hard material and uniform diameter bent to shape.

2. A method of making a cutting or creasing roll which comprises shaping hard flexible wire to the desired contour in a single plane, securing said wire to the surface of a flexible sheet, and mounting said sheet about the surface of a cylindrical roll with the wire face out.

3. A method of making a cutting or creasing roll which comprises bending a flexible wire of hard material to the desired contour substantially in a single plane, placing said bent wire flat on a plane bed, placing upon the bent wire a thin flexible sheet, causing the bent wire to adhere to the face of said sheet, and securing said sheet around the cylindrical surface of a cylindrical roll with the wire on the outer face of said sheet.

4. A method of making a cutting or creasing roll which comprises shaping steel wire to the desired contour in a single plane, placing the shaped wire on a

magnetized bed, pressing down on the wire a flexible sheet of metal having a coating of solder on its under face, heating and then cooling the sheet to sweat the wire to the underface thereof, wrapping the sheet around a roll with the wired face outward, and securing the sheet to the roll.

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