Sept. 27, 1932. E. M. SIMMONS 1,879,555

METHOD AND MACHINE FOR CUTTING AND FORMING PLATES AND OTHER ARTICLES

Filed Oct. 9, 1930 2 Sheets-Sheet 1

Fig. 1.

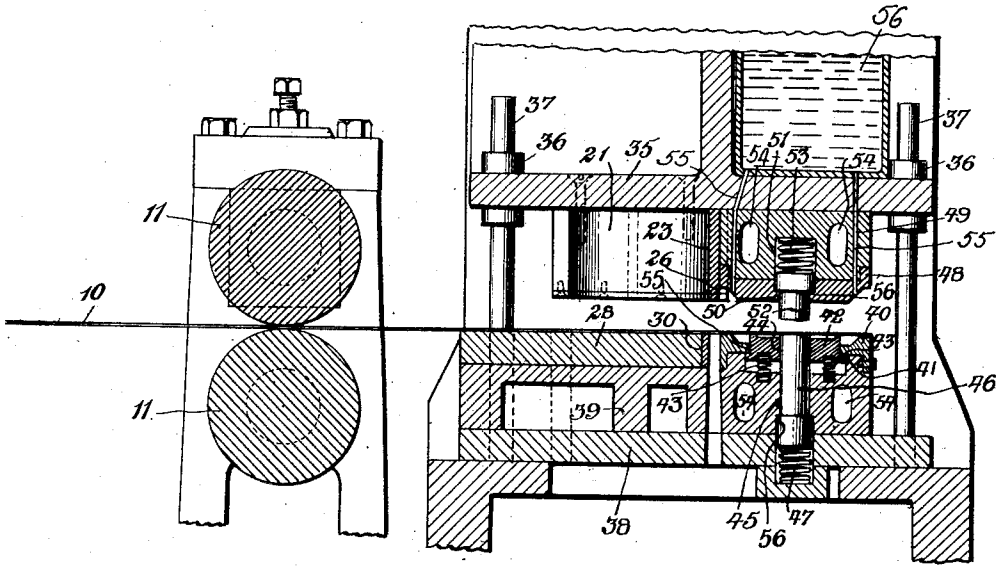
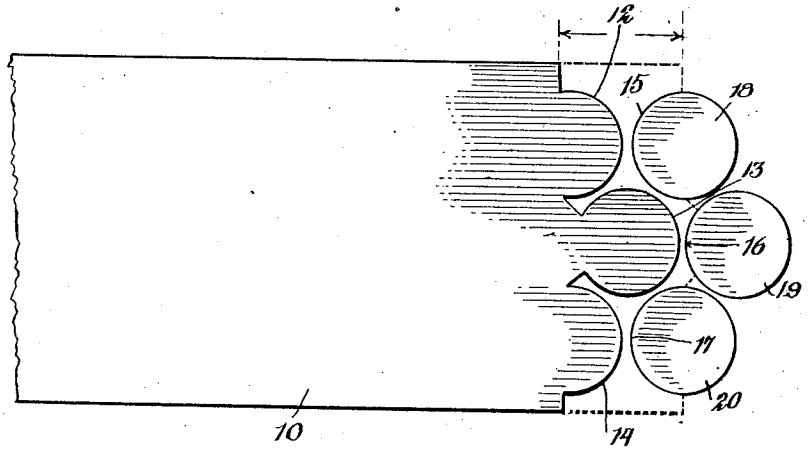


Fig. 2.



WITNESSES

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Fig. 3.

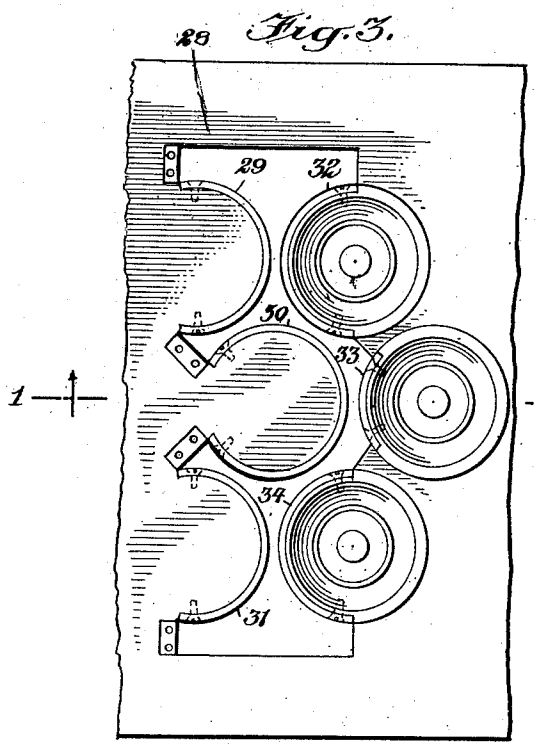


Fig. 4.

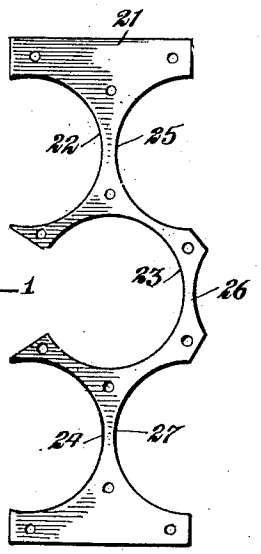


Fig. 5

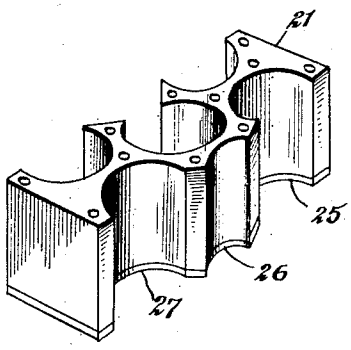
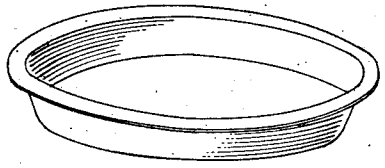


Fig. 6.



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UNITED STATES PATENT OFFICE

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METHOD AND MACHINE FOR CUTTING AND FORMING PLATES AND OTHER ARTICLES

Application filed October 9, 1930. Serial No. 487,602.

One of the objects of the invention is to provide means for cutting sides of a plate or plates from a sheet of material and for subsequently cutting the remaining sides of the plate or plates, which permits the plate or plates to pass freely from the machine.

A further object of the invention is to arrange the cutting means so that as the sheet of material passes through the machine the forward part of the sheet of material is first cut to form sides of the plate or plates and the rear portion of the sheet of material is subsequently cut to form the remaining sides of the plate or plates and to completely sever the blanks from the sheet of material. In this manner the blanks will be free to pass from the machine. The second cutting, which severs the blanks from the sheet of material, does not cut the material at the front of the machine, the forward edges of the blanks having been previously cut and freed from the body of the sheet of material.

Still another object of the invention is to provide dies or forming means operable in connection with the second cutting means so that the plate or plates will be formed by the dies as the blanks are severed from the sheet of material.

The invention furthermore has as an object to provide a cutting blade having adjacent cutting edges, one edge serving to cut one side of a blank and the other edge serving to cut subsequently the other side of the blank.

Other objects of the invention are to provide means to heat the dies, means to wet the paper when acted on by the said dies, and means for gripping the blank as it is acted on by the dies.

Another object of the invention is to provide a method of cutting and forming plates in connection with which the machine may be used.

Additional objects of the invention will appear in the following specification in which the preferred form of the invention is described.

In the drawings similar reference characters refer to similar parts in all the views, of which

Figure 1 is a sectional elevation illustrating the invention, the view being taken along the line 1—1 of Figure 3,

Figure 2 is a plan view illustrating the sheet of paper or other material as shown in Figure 1 with certain of the blanks severed by the cutter and other of the blanks partially severed by the cutter.

Figure 3 is a plan view of the lower cutter member and the dies associated therewith,

Figure 4 is a plan view of the upper cutter member,

Figure 5 is a perspective view illustrating the upper cutter member, and

Figure 6 is an enlarged perspective view illustrating a plate which may be made by the method and machine which is the subject matter of this application.

It will be understood that while the invention has been illustrated with particular reference to its use for manufacturing plates, the method and machine which are the subject matter of this application may also be used to manufacture, not only plates, but cake circles or discs, milk bottle caps, ice cream dishes of various shapes, pan linings of various shapes and sizes, cake liners, butter dishes or chips, spoons, and other articles.

By referring to the drawings it will be seen that a sheet of paper or other material 10 is fed by rollers 11, which may be rotated by any well known means. The sheet of paper or other material is fed by this means to the cutters and dies which will now be described.

As will be seen by referring to Figure 2 of the drawings, when the cutter is operated to make the first cuts in the sheet of paper or other material, these cuts will be the cuts 12, 13 and 14 forming the outer sides of certain of the discs. When the cutter is subsequently raised and lowered it will again cut the sheet of paper or other material to make the cuts 15, 16 and 17, these cuts 15, 16 and 17 being made between the cuts 12, 13 and 14 and the rollers 11, the cuts 15, 16 and 17 serving to completely sever the discs 18, 19 and 20 from the sheet of paper or other material 10. The upper cutter member 21, which is illustrated in Figures 4 and 5 of the drawings, has cutting edges 22, 23 and 24 to make the cuts 12, 13

and 14 and at its other side cutting edges 25, 26 and 27 to make the cuts 15, 16 and 17, it being understood that the discs 18, 19 and 20 will be severed from the sheet of paper or other material 10 by the said two series of cuts. The upper cutter member 21 cooperates with the lower cutter member 28, which has a cutting edge 29 for cooperating with the cutting edge 22, a cutting edge 30 for cooperating with the cutting edge 23 and a cutting edge 31 for cooperating with the cutting edge 24, the lower cutter member 28 also has a cutting edge 32 for cooperating with the cutting edge 25, a cutting edge 33 for cooperating with the cutting edge 26 and a cutting edge 34 for cooperating with the cutting edge 27. Therefore, as the sheet of paper or other material 10 passes through the machine, it is first cut by the cutting edges 22, 29, 23, 30, 24 and 31 to make the cuts 12, 13 and 14 and is subsequently cut by the cutting edges 25, 32, 26, 33, 27 and 34 to make the cuts 15, 16 and 17, thereby forming the discs 18, 19 and 20.

The upper cutter member 21 is mounted on a base 35 which has bearings 36 through which guide members 37 are disposed, these guide members 37 being mounted on a base 38 to which a support 39 is secured, the lower cutter member 28 being secured to the said support 39. There is also secured to the base 38 a die 40, the die 40 having an opening 41 in which a gripping plate 42 is disposed, the gripping plate 42 being held yieldingly upward by means of the springs 43. There is also an opening 44 in the gripping plate 42 and an opening 45 in the base 38, in which is disposed a jaw 46, the jaw 46 being held yieldingly in position by means of a spring 47. The die 40 cooperates with a die 48 which is secured to a support 49, which in turn is secured to the base 35. The die 48 and the support 49 have openings 50 and 51 in which a jaw 52 is disposed, the jaw 52 being positioned for cooperating with the jaw 46 and being held yieldingly extended by means of a spring 53. It will be understood that the die 48 with its jaw 52 will descend with the upper cutter member 21 and that as the cuts 15, 16 and 17 are made to complete the discs 18, 19 and 20, these discs 18, 19 and 20 will be gripped by the jaws 46 and 52 and also between the gripping plate 42 and the die 48, which will serve to hold the discs in position as they are formed by the dies 40 and 48.

The supports 39 and 49 are provided with openings 54 through which steam may pass as a means for heating the dies 40 and 48 which are disposed in close proximity to the openings 54, but it will be understood that any other desired means may be employed to heat the said dies 40 and 48. It is also advantageous to wet the blanks 18, 19 and 20 as they are about to be formed in shape by means of the dies 40 and 48 and any desired means may be employed to wet these blanks such as the outlets 55 leading from a container 56.

As shown in the drawings the upward movement of the gripping plate 42 is limited by the shoulders 55 and the movement of the jaws 46 and 52 is limited by the shoulders 56.

What is claimed is:

1. A method of cutting blanks from a sheet of material consisting of cutting the sheet of material to form one side of a blank and of subsequently cutting the sheet of material to form the other side of the blank.

2. A method of cutting blanks from a sheet of material consisting of cutting the forward part of the sheet of material to form one side of a blank and of subsequently cutting the sheet of material at the rear of the first cut to form the other side of the blank.

3. A method of cutting blanks from a sheet of material consisting of cutting the sheet of material to form one side of a blank and of subsequently cutting the sheet of material to form the other side of the blank and to sever the blank from the sheet of material.

4. A method of cutting blanks from a sheet of material consisting of cutting the forward part of the sheet of material to form one side of a blank and of subsequently cutting the sheet of material to form the other side of the blank and to sever the blank from the sheet of material.

5. A method of cutting and forming articles from a sheet of material consisting of cutting the forward part of the sheet of material to form one side of a blank, of subsequently cutting the sheet of material at the rear of the first cut, and pressing and forming the blank.

6. A method of cutting and forming articles from a sheet of material consisting of cutting the forward part of the sheet of material to form one side of a blank, and of subsequently and simultaneously cutting the sheet of material at the rear of the first mentioned cut and pressing and forming the blank.

7. In a machine of the class described, means for feeding a sheet of material, cutting means for cutting the sheet of material to form one side of a blank, and additional cutting means at a greater distance from the first mentioned means than the first mentioned cutting means to subsequently form another side of the blank.

8. In a machine of the class described, means for feeding a sheet of material, cutting means for cutting the sheet of material to form one side of a blank, and additional cutting means at a greater distance from the first mentioned means than the first mentioned cutting means for cutting the material between the first mentioned cut and the first mentioned means.

9. In a machine of the class described, means for feeding a sheet of material, cut-

ting means for cutting the material to form front portions of staggered blanks, and additional means at a greater distance from the first mentioned means than the first mentioned cutting means to form rear portions of the staggered blanks.

10. In a machine of the class described, means for feeding a sheet of material, cutting means for cutting the material to form front portions of staggered blanks, and additional cutting means at a greater distance from the first mentioned cutting means than the first mentioned cutting means for cutting the material between the first mentioned cut and the first mentioned means to complete and sever the blanks from the sheet of material.

11. In a machine of the class described, cutting means having a portion for cutting a sheet of material to form one side of a blank, and a portion spaced from the first mentioned portion for cutting the material to form another side of the blank, and dies at one of the portions of the cutting means to press and form the blank.

12. In a machine of the class described, cutting means having two cutting portions for cutting respectively two sides of a blank, each cutting portion having ends with the ends of one cutting portion extending away from the ends of the other cutting portion.

13. In a machine of the class described, cutting means having two cutting portions for cutting respectively two sides of a blank, each cutting portion having ends with the ends of one cutting portion extending away from the ends of the other cutting portion, and dies at one of the cutting portions of the cutting means for cooperating therewith.

14. In a machine of the class described, a cutting member having two cutting surfaces, each with two terminals, the terminals of each of the cutting surfaces extending away from the terminal of the other cutting surface.

15. In a machine of the class described, cutting means having two cutting portions for cutting respectively two sides of a blank, each cutting portion having ends with the ends of one cutting portion extending away from the ends of the other cutting portion, dies at one of the cutting portions of the cutting means for cooperating therewith, and means to heat the dies.

16. In a machine of the class described, cutting means having two cutting portions for cutting respectively two sides of a blank, each cutting portion having ends with the ends of one cutting portion extending away from the ends of the other cutting portion, dies at one of the cutting portions of the cutting means for cooperating therewith, means to wet the paper, and means to heat the dies.

17. In a machine of the class described, a die having an opening, a gripping plate disposed in the opening, means to hold the gripping plate yieldingly extended, the gripping plate having an aperture, a jaw in the aperture, and means to hold the jaw yieldingly extended.

18. In a machine of the class described, two cooperating dies, each of the dies having an opening, a jaw in the opening in one of the dies, means for holding the jaw yieldingly extended, a gripping plate in the opening in the other die, means for holding the gripping plate yieldingly extended, the gripping plate having an opening, a jaw in the last mentioned opening, and means for holding the last mentioned jaw yieldingly in position for cooperating with the first mentioned jaw.

ECKLEY M. SIMMONS.