

1,310,697.

H. M. HILL,
DIE.
APPLICATION FILED FEB. 17, 1916.

Patented July 22, 1919.
2 SHEETS—SHEET 1.

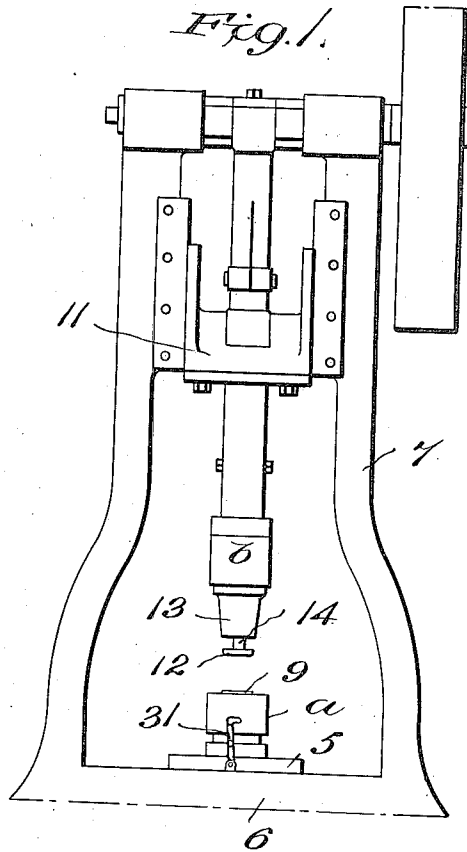


Fig. 6.

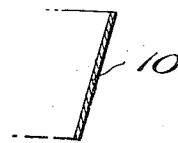


Fig. 2.

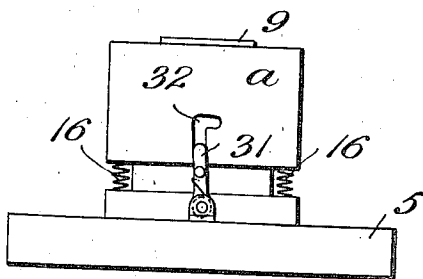


Fig. 7.

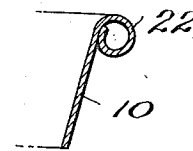
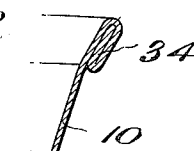


Fig. 8.

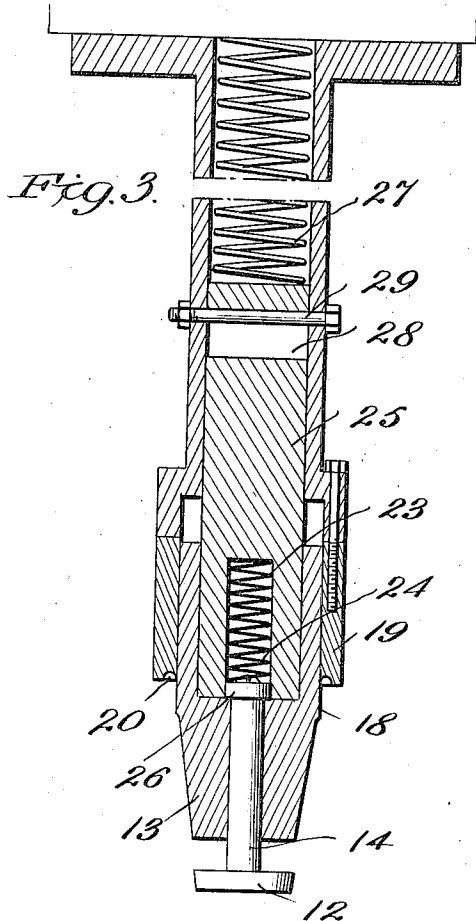
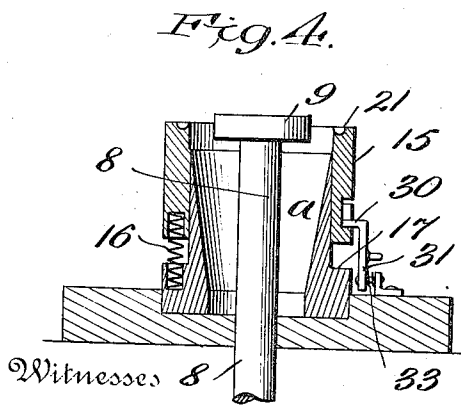
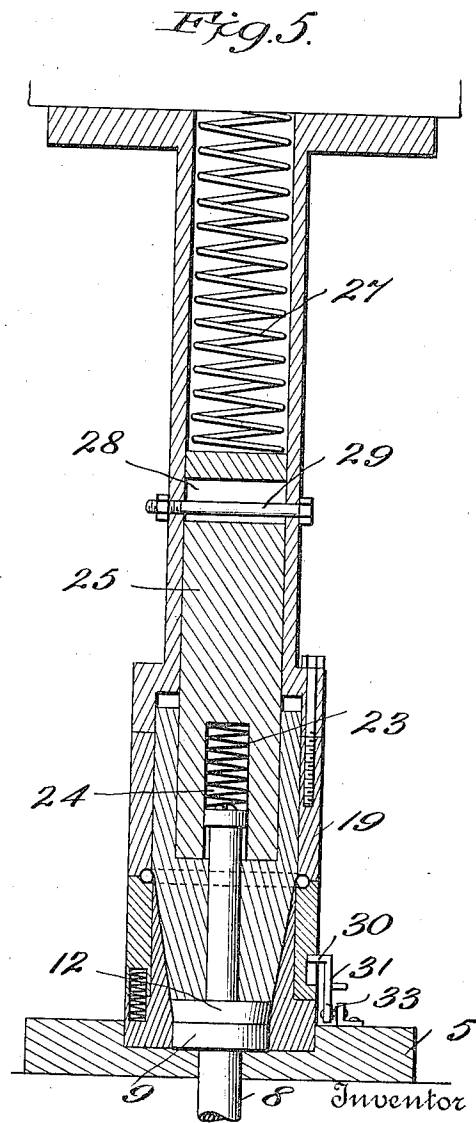


Witnesses

Inventor
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by
John A. Donegan, his Attorney

1,310,697.

Patented July 22, 1919.
2 SHEETS—SHEET 2.



Herbert M. Hill,
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UNITED STATES PATENT OFFICE.

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1,310,697.

Specification of Letters Patent. Patented July 22, 1919.

Application filed February 17, 1916. Serial No. 78,802.

To all whom it may concern:

Be it known that I, HERBERT M. HILL, a citizen of the United States, residing at New York, county and State of New York, have invented a certain new and useful Improvement in Dies, of which the following is a specification.

The general object of the invention is to effect in a simple and expeditious manner the forming of a flange on the rim of a liquid holding paper receptacle as for instance a sanitary drinking cup. And to this end the invention resides in a die which is adapted to form the rim portion of the receptacle into a permanent curl or bead.

Other objects will appear and be better understood from that embodiment of my invention of which the following is a specification, reference being had to the accompanying drawings forming part hereof, and in which:

Figure 1, is a front elevation of the invention connected so as to form part of a conventional form of press.

Fig. 2, is an enlarged detail side elevation of the female member of the die.

Fig. 3, is an enlarged vertical longitudinal section of the male member.

Fig. 4, is a detail vertical longitudinal section of the female member.

Fig. 5, is a detail vertical section of the male and female members united.

Fig. 6, is a sectional detail of an end portion of a paper receptacle prior to being operated upon by the present invention.

Fig. 7, is a view similar to Fig. 6, showing the edge portion of the receptacle curled or beaded by the act of moving the parts into the position shown in Fig. 5.

Fig. 8, is a view similar to Fig. 7, but showing the beaded edge crushed.

The die of this invention comprises a female portion "a" which is adapted to be secured in any suitable manner to the bolster 5, on the bed 6, of the press 7. The ejector stem 8, extends through the lower open end of the female member "a" and through the bolster 5, and bed 6, of the press. The stem 8, is connected to a conventional type of mechanism forming part of press 7 (but not herein shown) which operates to reciprocate the ejector stem vertically. The ejector head 9, at the upper end of stem 8, is so proportioned as to form a bottom for the lower end of the female member "a" when the stem 8, is in its lowermost posi-

tion as shown in Fig. 5. When the stem 8, is in the position shown in Fig. 4, the said stem is at the limit of its upward movement and in this position the head 9, is approximately in alinement with the upper open end of female member "a." In this position of the parts the cup 10, a section of which is shown in Fig. 6, is placed upright on the head 9, and moves downwardly with the head and into the female member during the down stroke of the ejector stem 8.

The male member "b" of the die of this invention is adapted to be suitably connected to the slide 11, of press 7, so as to reciprocate therewith. When the cup 10, to be operated upon is placed on head 9, as previously described, the male member "b" moves downwardly whereupon the head 12, of the stripper is brought into contact with the inner face of the bottom of said cup. Thus the bottom is clamped between the heads 9 and 12, and the cup is carried positively into the female member "a." The interior surface area of female member "a" approximates the exterior surface area of cup 10, and the surface area of the end portion of plunger 13, which enters the cup, is approximately equal to the area of the inner surface of the cup. The wall of cup 10, is flared and the male and female members are shaped to correspond to the contour of the cup except that from a point adjacent to its upper end the inner surface of the female member extends vertically by reason of the presence of a cylindrical collar 15, which forms part of female member "a." The collar embraces the female member "a" and is so supported by a plurality of springs 16, that its lower end is normally held in spaced relation to a stop shoulder 17, on female member "a." The end portion of plunger 13, also has a cylindrical surface 18, forming a continuation of the flared surface of that member. When the end portion of plunger 13, is entered into female member "a" the cup is subjected to considerable lateral pressure and its upper edge portion disposed between the surfaces of the collar and the cylindrical portion of the plunger extends vertically upward. In this position of the parts the end of sleeve or casing 19, which surrounds plunger 13, and which is secured to slide 11, bears on the upper edge of collar 15, so that upon further downward movement of male member "b" the collar 15, is depressed against

the action of its supporting springs 16, and into contact with stop shoulder 17.

This action on the part of collar 15, exposes the vertically extending rim portion 5 of cup 10, and the downward movement of sleeve 19, causes the edge of the exposed portion of the cup to enter a circular groove 20, so disposed in the lower end of sleeve 19, that its inner side merges into the cylindrical surface 18 of the plunger. During the 10 downward movement of the sleeve 19 and collar 15, the edge of the cup follows the wall of groove 20, and passes into the upper end of collar 15, and passes over the wall of 15 that groove until it contacts with the wall of the cup at which time collar 15, is in contact with stop shoulder 17, and the male member is at the end of its downward stroke.

The result of this operation on the edge of 20 the cup is the tubular bead indicated by 22, in Fig. 7. Here it will be noted that the edge is bent around until it touches the wall of the vessel and so forms a closed curved edge. This is a stiff and firm edge which 25 keeps the vessel in shape when under external pressure near the rim. When head 9, of the ejector is positioned so as to form the bottom of female member "a" the stripper yields against the action of a spring 23, 30 which is arranged in a guide 24, in the shank 25 of plunger 13, and is disposed so as to bear on the inner end of the stem 14, which is disposed within the guide 24, and held against displacement by a head 26, which 35 normally abuts the inner end of the recess in the end portion of the plunger which receives the stem 14.

In the action of sleeve 19, depressing collar 15, plunger 13 yields and compresses a 40 spring 27 disposed in the upper end portion of sleeve 19, and adapted to hold the said end portion of the plunger projected. The outward and inward movements of the plunger are limited by the sides of a slot 28, 45 formed therein and a pin 29, which passes through the sleeve and through the said slot.

When the male member is at the end of its downstroke the nose 30, of a spring-actuated latch 31, disposed in a bayonet slot 32 in the 50 outer face of collar 15, aligns with the lateral portion of the said slot and moves thereinto under the action of its springs 33, and thereby locks the collar against upward movement under the action of its spring 55 supports 16, during the up stroke of the male member. When the end of sleeve 19,

moves away from collar 15, plunger 13 is projected by the action of spring 27 and thus operates to disengage the curled flange from groove 20. At the same time the 60 ejector head 9, moves upwardly and disengages the lower segment of the flange 22 from groove 21. During the up stroke of the male member and when stripper head 12 is in spaced relation to ejector head 9, at 65 which time the latter is approximately at the upper end of the female member and supporting the cup, said head 12 moves downwardly under the action of spring 23, and strips the cup from the end portion of plunger 13. Before operating on a subsequent 70 cup latch 31 is moved so as to release collar 15 to move upwardly under the action of its springs 16 and into the position shown in Figs. 1, 2 and 3. It will be noted that the 75 inner edge of groove 20 is somewhat higher than the outer so that when the parts are brought together as shown in Fig. 5, a clearance will be had and shearing of the paper avoided. It will be further noted that up to 80 the time of actually entering the groove 20 the paper is firmly clamped between the portion 18 of the plunger and collar 15 so that buckling of the paper, while the edge is being compressed by the walls of the grooves, 85 is prevented.

When cup 10 is flanged or beaded as shown in Fig. 7 it is by preference arranged in a forming die which operates to crush the flange or bead so that it will appear as 90 indicated by 34 in Fig. 8. It will of course be understood that the provision of this operation is optional, it being obvious that the cup may be furnished with the bead or flange 22, if so desired. 95

What is claimed as new is:

A means for forming a closed curved edge about the rim of a paper vessel which consists of male and female dies which hold the vessel firmly between them, and two external and movable collars provided with registering recesses which when brought together constitute a substantially circular groove, and means for forcing these collars 100 first together and then toward the bottom of the vessel while so held so that the collars engage the expanded edge of the vessel and force it to form a closed curved edge. 105

In testimony whereof, I have signed my name to this specification this 16th day of 110 February, 1916.

HERBERT M. HILL.