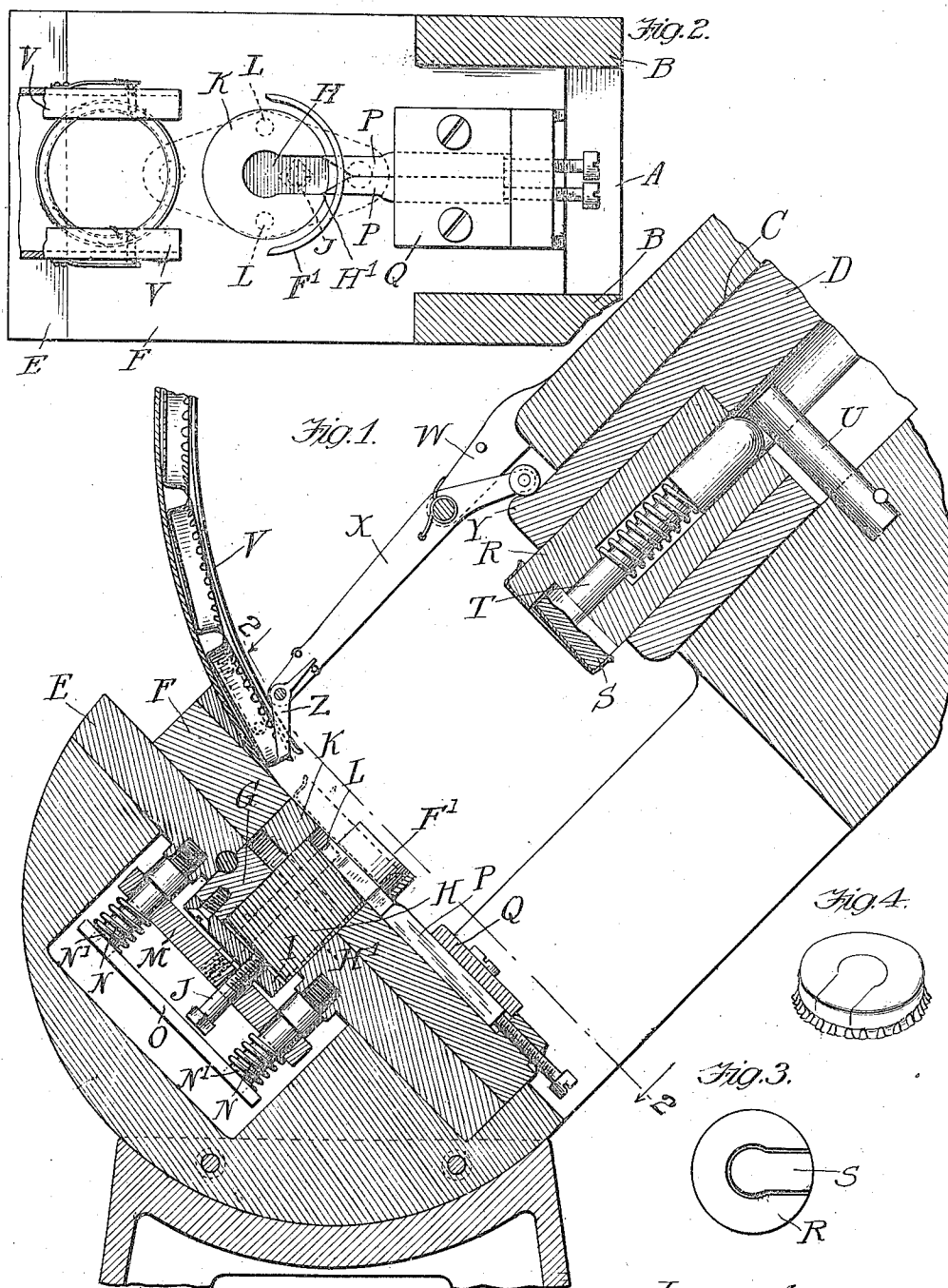


E. S. NORTON.
MACHINE FOR CUTTING SLITS IN BOTTLE CAPS AND SIMILAR ARTICLES
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Witnesses
Martin H. Olsen.
Robert Dobberman

Inventor
Elliott S. Norton
By Rector, Hibben, Davis & Macaulay
His Attys.

UNITED STATES PATENT OFFICE.

ELLIOTT S. NORTON, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
HANDYCAP COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MACHINE FOR CUTTING SLITS IN BOTTLE-CAPS AND SIMILAR ARTICLES.

1,136,162.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ELLIOTT S. NORTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Cutting Slits in Bottle-Caps and Similar Articles, of which the following is a description, reference being had to the drawings forming a part of this specification.

My invention relates to machines for cutting, upon the face or top of bottle caps of a well known type having upon the top or disk portion of the cap and extending down on its rim portion a tearing or rupturing tongue, the cut or slit forming the central tongue of the cap and side cuts continuous with the cuts on the face and defining that portion of the tongue which extends downwardly on the cylindrical portion of the flange or rim portion of the cap. It is to be understood that before this operation the caps have been stamped into form by any suitable machine.

The object of the present invention is to provide mechanism which will perform this cutting or scoring work with rapidity and accuracy, and which shall be simple in construction and efficient in operation. To this end I have devised a novel arrangement and construction of cutting dies, acting in such manner that at one movement of the plunger die the face and side cuts are simultaneously made, with which is associated simple and effective feeding and ejecting mechanism whereby the caps are fed to the dies and ejected therefrom after the cut has been made.

My invention consists in certain novel features of construction and arrangements and combinations of parts, the essential elements of which are recited in the appended claims and a preferred form of embodiment of which is shown in the accompanying drawings and hereinafter described.

In the drawings, Figure 1 is a central vertical section taken from front to rear through the head of a press to which my invention is applied; Fig. 2 is a plan view of the bed or face of the machine showing the parts lying below the plane indicated by the dotted line 2-2 of Fig. 1; Fig. 3 is a bottom view of the punch R shown in Fig. 1; and Fig. 4 is a perspective of a slitted or scored bottle cap.

The same letters of reference indicate the same parts in the several views.

My invention is designed to be applied to any suitable stamping or punching press, which in large part may be of ordinary and well-known construction, and therefore need not be illustrated in its entirety. Upon the bed of the press is mounted the die plate F, supported by the bolster plate E. The sliding press head D working in the slideway C is standard equipment and unnecessary to illustrate. The punch or die R is inserted into the press head D and held by any suitable means. The die plate F and bolster plate E carry the cutting dies and associated parts. Both these plates, which might be formed integral, and together may be termed the bed plate, are provided with circular openings in alinement with the axis of the press head D of such size as to receive the cylindrical side of the bottle caps. A block G which in the present instance is incompletely annular in form, one side having an opening which embraces the lower punch H, in the present instance of the form shown in Fig. 2, is fastened to the lower plate E, by taper pin and to this block is rigidly secured, by screws or in other suitable manner a disk I. An adjusting screw J threaded in the disk I is provided for exact adjustment of the punch H. This punch is of the proper shape to form that portion of the tongue lying on the face or top of the cap, in the present instance of the outline illustrated in Figs. 2, 3 and 4, the outer vertical edges H', Figs. 1 and 2, being slightly beveled to permit vertical adjustment of the die without interference with a pair of side cutters which will be hereafter described.

For the purpose of providing a surface flush with the upper surface of the plate F, upon which the caps may be properly fed, a sliding block K, similar in outline to the block G, is provided, this block being rigidly connected by means of a pair of long screws L L to a plate M which is pressed upwardly by springs N surrounding a pair of bolts N' N' secured to the plate E. These bolts are connected by a cross-strip O which provides a seat for the springs, and such bolts are shouldered at the proper points to permit the block K to rest in its uppermost position with its surface flush with the plate F. A semi-circular stop F' is provided concentric with the opening in the plate F to

position the caps below the center of the press head as they are fed to the dies.

A pair of side cutters P P are provided to form cuts on the cylindrical side portions of the cap continuous with the cut on the face or top. These side cutters have a cutting edge of proper depth or height to make a cut of the desired extent and are secured firmly to the plate F by means of a cap-plate 10 or cover Q which may be screwed down tightly upon them. These cutters may be longitudinally adjusted by means of adjusting screws, the cap plate being of course loosened sufficiently to permit such adjustment. 15

In the press head D is placed the punch or die R of proper size to enter the inside of the caps as snugly as may be without binding. In this punch is cut an opening 20 forming a die element of the same shape as the punch H, and in this opening the stripper S is housed. The stripper S has a stem T surrounded by a spring bearing on shoulders in the punch and on the stem T and tending to hold the stripper up until in 25 moving upward it reaches the knock out pin U. When the press head is in its uppermost position the top of the stripper stem T comes in contact with the knock out pin 30 U fixed to the frame of the machine and extending through a slot in the press head, so that the stem and stripper are forced downward relatively to the punch or die. The die is recessed as shown in Figs. 1 and 3 35 to form a shearing surface cooperating with the surface of the lower die H, and the lower face of the stripper is slightly inclined or oblique with respect to the axis of its movement.

The caps are fed to the dies through the chute V, at the lower end of which are a pair of oppositely disposed springs equipped with pins which yieldingly sustain the train of caps in the chute. Upon the head of the 45 machine is mounted a bracket W, upon which bracket is pivoted a lever X, the upper arm of which carries a roller rocked by a cam Y upon the press head D. The lower end of the lever carries a pawl Z, and the arrangement and adjustment of the parts 50 is such that as the plunger nears its uppermost position (see Fig. 1) the cam Y contacts the roller and then rocks the lever to feed the lowermost cap in position to be engaged by the plunger. 55

The operation of the machine will readily be understood from the construction which has been described. As the plunger descends it engages the cap which has previously been fed in the manner described 60 and carries it downward, the sliding block K being depressed and the side cutters forming cuts on the side of the cap as it descends, and the top and bottom dies forming a cut 65 continuous with the side cuts as the plunger

reaches lowermost position. Owing to the obliquity of the faces of the lower die and stripper the tongue which is formed is bent upward slightly toward its tip or inner end and is frictionally held within the 70 punch or die R, so that the cap is carried upward by the press head until the top of the upper die stem contacts the pin U, when the stripper is forced downward slightly, and the cap falls off. Meanwhile, as the 75 press head rises, the sliding block K has been returned to uppermost position by means of the springs N, to form a suitable surface upon which the succeeding cap may fall. 80

I claim:

1. Dies for cutting a top and side slits in caps comprising a fixed die and a cooperating plunger and movable die which is adapted to center the cap, said dies being formed 85 with opposed shearing edges arranged to form the end portion of a tongue upon the disk portion of a cap, and side cutters adapted to form side cuts forming a continuation of said tongue on the side of such cap as it 90 is centered and carried by the plunger toward the fixed die.

2. Dies for cutting a top and side slits in caps comprising a fixed die and a cooperating plunger and movable die which is adapted to center the cap, said dies being formed 95 with opposed shearing edges arranged to form the end portion of a tongue upon the disk portion of a cap, and a pair longitudinally adjustable side cutters adapted to 100 form side cuts forming a continuation of said tongue on the side of such cap as it is centered and carried by the plunger into the socket.

3. In a device of the character described 105 for slitting caps, a bed having a socket, a die secured within said socket, a plunger equipped with a cooperating die and adapted to center the caps, said dies being formed with opposed shearing edges arranged to 110 form the end portion of a tongue upon the disk portion of a cap, and side cutters adapted to make side cuts forming a continuation of said tongue on the side of such cap, said 115 side cutters being mounted on said bed and longitudinally adjustable toward and from the path of the plunger.

4. In a device of the character described for slitting caps, a bed having a socket, a die secured within said socket and formed 120 to make a cut delimiting a tongue in the top portion of the cap, a sliding block also within said socket embracing said die and normally flush with the surface of said bed, and a plunger equipped with a cooperating 125 die, said plunger being arranged to center said caps in said socket and depress said sliding block.

5. In a device of the character described for slitting caps having substantially cylin- 130

drical rim portions, a bed having a socket, a plunger arranged to center a cap and carry it axially into said socket, and a side cutter arranged to project into the path of the cylindrical portion of the cap and form a side cut thereon.

6. In a machine of the character described, upper and lower dies for cutting a slit on the top of a cap, the shearing faces of one of said dies being slightly oblique to the plane of said top.

7. In a machine of the character described for slitting bottle caps, a lower fixed die having an oblique face, a reciprocating plunger arranged to center the caps, and equipped with an upper die, and a stripper carried by said plunger, said stripper having a slight longitudinal movement relative to said plunger and being formed with an oblique face corresponding to that of the upper die.

8. In a machine of the character described for slitting bottle caps to form tongues thereon, a lower fixed male die having an oblique shearing face, a reciprocating plunger arranged to center the caps and equipped with an upper female die, whereby the tongue of the cap will enter and be frictionally held in the female die and the cap will be carried by the plunger after the slit has been made.

9. In a machine of the character described, a lower fixed die, a reciprocating plunger arranged to center the caps and equipped with an upper die member, a stripper carried by the plunger and having limited longitudinal movement relatively thereto, a spring tending to press said stripper to uppermost position with respect to the plunger, and a fixed stop contacting said die member near the top of the stroke of the plunger.

10. In a machine of the character described, a bed plate having an opening for the reception of the caps, a die within said opening formed to make a cut delimiting a tongue in the top portion of a cap, a complementary depressible block also in said opening embracing said die, pins fixed in said block, a plate fixed to said pins, a stop limiting the upward movement of said block and associated parts, and spring tension means for yieldingly holding such associated parts in uppermost position.

11. In a machine of the character described, a bed plate having an opening for the reception of the caps, a die within said opening, a complementary fixed block also within said opening and embracing said die, a disk mounted in fixed position below said block, and an adjusting screw threaded in said disk and bearing against said die.

12. In a machine of the character described, a bed plate having an opening for the reception of the caps, a die within said

opening, a complementary fixed block also within said opening and embracing said die, a disk secured to said block, and an adjusting screw threaded in said disk and bearing against said die.

13. In a machine of the character described, a bed plate having an opening for the reception of the caps, a die within said opening, a complementary depressible block also in said opening embracing said die adjacent its shearing face, spring tension means fixed to a stationary part of the machine for yieldingly holding said block with its upper surface flush with the upper surface of the bed plate, a complementary fixed block also within said opening embracing the lower portion of said die, and an adjusting screw threaded in a fixed bearing below said fixed block and bearing against said die.

14. In a machine of the character described, a bed plate having a circular opening for the reception of the caps, a die within said opening, a complementary depressible block also in said opening embracing said die adjacent its shearing face, downwardly extending pins secured to said block, spring tension means fixed to said bed plate and tending to yieldingly elevate said block, a stop for limiting the upward movement of such block, a complementary fixed block also within said opening embracing the lower portion of the die, a disk secured to said fixed block, and an adjusting screw threaded in said disk and bearing against said die.

15. In a machine of the character described and having an inclined bed plate carrying a fixed lower die and also having a reciprocating plunger adapted to center the caps and equipped with an upper die, an upwardly extending feed chute, spring means at the lower end of said chute for yieldingly restraining downward movement of the train of caps, a vibrating lever pivoted on one end of the lever adapted to engage the lowermost cap, and a cam on said plunger adapted to contact said lever and vibrate the same to feed the caps one by one to the fixed die.

16. In a machine of the character described and having an inclined bed plate carrying a fixed lower die and also having a reciprocating plunger adapted to center the caps and equipped with an upper die, an upwardly extending feed chute, spring means at the lower end of said chute for yieldingly restraining downward movement of the train of caps, stop means on said bed plate concentric with the axis of the plunger, and means operated by said plunger upon its upward stroke for releasing the lowermost cap.

17. In a machine of the character de-

scribed and having an inclined bed plate
carrying a fixed lower die and also having a
reciprocating plunger adapted to center the
caps and equipped with an upper die, an up-
5 wardly extending feed chute, spring means
at the lower end of said chute for yieldingly
restraining downward movement of the train
of caps, stop means on said bed plate con-
centric with the axis of the plunger, and a
10 vibrating lever rocked by said plunger dur-
ing the latter part of its upward stroke for
forcing the lowermost cap past said spring
restraining means.

18. In a machine of the character de-
15 scribed and having a bed plate equipped

with a fixed die and also having a recipro-
cating plunger adapted to engage the caps
and equipped with a movable die, a feed
chute for guiding a train of caps, a pair of
springs at the inner end of the chute ar- 20
ranged to engage the end cap of the train,
and a vibrating pawl arranged to feed the
caps one by one past said springs to the
fixed die synchronously with the movements
of the plunger.

ELLIOTT S. NORTON.

Witnesses:

LOUIS B. ERWIN,
ROBERT DOBBERMAN.