Nov. 28, 1944. C. M. McVEY 2,363,540

APPARATUS FOR STAMPING

Filed Sept. 15, 1942

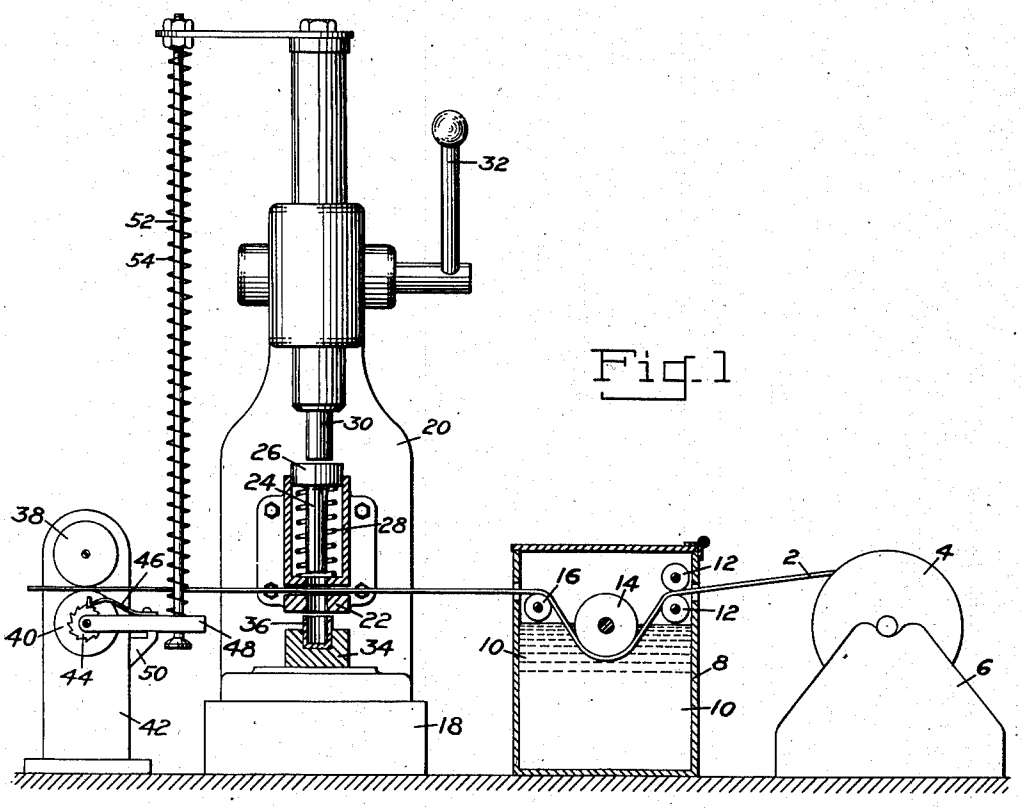


Fig. 1

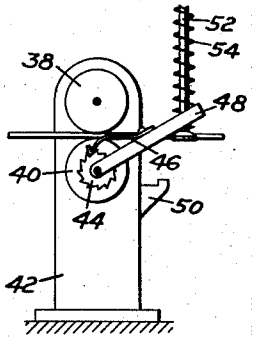


Fig. 2

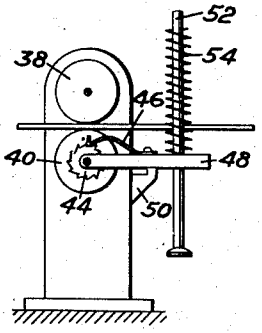


Fig. 3

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APPARATUS FOR STAMPING

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Application September 15, 1942, Serial No. 458,475

1 Claim. (Cl. 113—80)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a process for stamping out metal discs and seating them in the bottom of cup-shaped members and apparatus therefor; more particularly, it relates to micro thin aluminum which is cut into discs and is seated in the bottom of detonator cups.

When thin sheet metal is stamped or punched by a punch having a desired contour, it has been found that particles, or "feathers" of the metal build up in the punch guides, eventually interfering with successful and efficient operation of the machine. It has been found that the undesirable condition may be eliminated by properly lubricating the sheet stock of the metal from which the blanks or discs are stamped.

Accordingly, it is the object of this invention to provide a manufacturing apparatus in which sheet metal is lubricated and is then fed into a machine which stamps out blanks of the metal and seats them in the bottom of cup-shaped articles. Although the invention relates specifically to micro thin aluminum discs seated in detonator cups, it has general application. The lubricant used is graphite, which is preferably applied by immersing the sheet stock in a bath consisting of the lubricant suspended in a highly volatile carrier, such as carbon tetrachloride. The carrier evaporates quickly, leaving a thin, uniform layer of the lubricant on the sheet stock. The stamping and seating operations are preferably carried out in one stroke of the punch.

The specific nature of the invention as well as other objects and advantages thereof will clearly appear from a description of a preferred embodiment as shown in the accompanying drawing in which:

Fig. 1 of the drawing is a view in elevation, with parts broken away and in section, of apparatus designed to carry out the process of the invention.

Fig. 2 shows the strip feed mechanism in the position it takes at the upper limit of travel of the actuating mechanism.

Fig. 3 shows the mechanism of Fig. 2 at the lower limit of travel.

Referring to the drawing in detail, sheet metal strip stock **2** is shown as unwinding from a reel or spool **4** mounted on a base **6**. Stock **2** passes to the lubricating mechanism which consists of a tank **8** containing a bath **10**. Bath **10** is a highly volatile carrier in which is suspended a finely divided lubricant. The carrier is preferably carbon tetrachloride, and the lubricant is finely divided graphite. The tank is provided with a pair of entrance rollers **12** to which the strip feeds upon entering the tank. The strip then passes under a large submerging roller **14** and over an exit roller **16**, whence it passes out of the tank to the stamping machine and the associated feed mechanism.

The machine comprises a base **18** having an upright support **20**. A stamping die **22** is mounted for cooperation with a punch **24** mounted on cross head **26**. Spring **28** biases punch **24** away from the die. Punch **24** is actuated by plunger **30**, which in turn is controlled by handle **32**.

Positioned beneath the die is a block **34** supporting a cup-shaped member **36**, such as a detonator cup.

Feed mechanism to pull the strip stock through the press is provided. Friction rollers **38** and **40** are mounted on pedestal **42**. Secured to roller **40** is ratchet wheel **44**, and pawl **46** spring mounted on arm **48** cooperates therewith. A stop **50** on pedestal **42** determines the lower limit of movement of arm **48**. Arm **48** is moved upward to rotate the friction rollers by actuating rod **52**, which is itself moved by movement of handle **32**. See Fig. 2. On the down stroke of handle **32**, spring **54** moves arm **48** down against stop **50**, snapping pawl **46** over to engage a fresh tooth on the ratchet. Further movement downward of the handle merely serves to compress the spring **54**, as shown in Fig. 3, because rod **52** slides freely in arm **48**.

Operation.—The strip stock feeding through tank **8** is immersed in the bath, picking up a coating of the bath on both surfaces. As soon as the strip leaves the tank, evaporation of the highly volatile carrier takes place. By regulating the spacing of tank **8** from the press, the time that it takes any fixed point on the strip to move from the tank to the press can be regulated to permit substantially complete evaporation of the carrier, leaving a thin, uniform film of lubricant on both sides of the strip. In the press, punch **24** cooperates with die **22** to stamp a disc of the desired shape out of the strip. The punch moves through the die and seats the disc in the bottom of cup **36**. Handle **32** is then raised to permit spring **28** to withdraw the punch. Handle **32** is raised still further to turn friction rollers **38** and **40** through rod **52**, pawl **46**, and ratchet **44**, pulling the strip along into position for another disc to be seated, and the cycle is repeated.

I claim:

An apparatus for stamping discs from metal

strips for seating in cup shape receptacles, comprising a main support, cup supporting means on said support, a stamping die above said cup supporting means, a hollow cylinder above said die whose lower end is in strip guiding relation to said die, said cylinder having an aperture in its lower end, a spring supported punch in said cylinder reciprocable through said aperture, a manually operable plunger on said main support for operating the punch, a strip feed mechanism to one side of the main support comprising a standard having an upper and a lower feed roll journaled thereon, a ratchet fixed to the lower roll, a rockable arm mounted concentrically with said ratchet roll, a stop to limit downward movement of said arm, a laterally extending member carried by the upper end of the plunger, a rod connecting said member and rockable arm and having means on its lower end for engagement with the underside of said rockable arm on the upward movement of the plunger to rotate the ratchet roll, a spiral spring surrounding the rod for returning said rockable arm to normal position against the stop upon the downward movement of the plunger.

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