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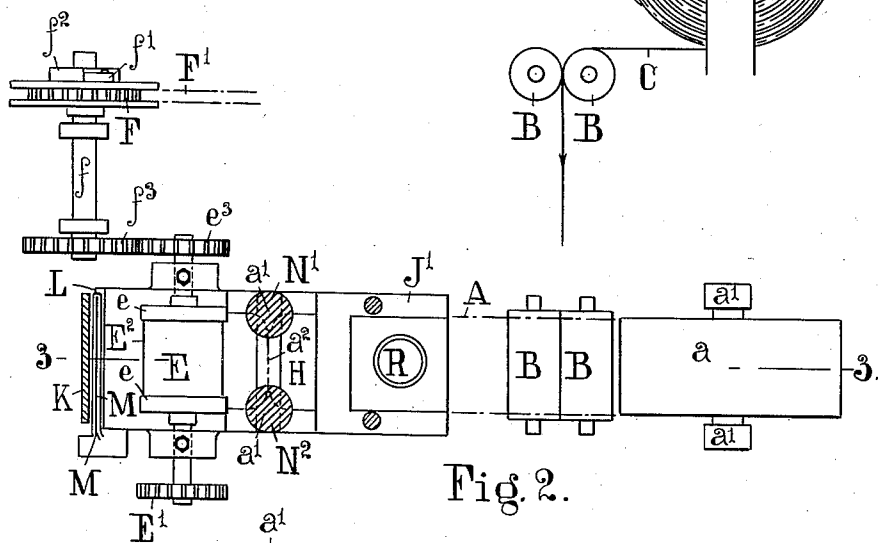
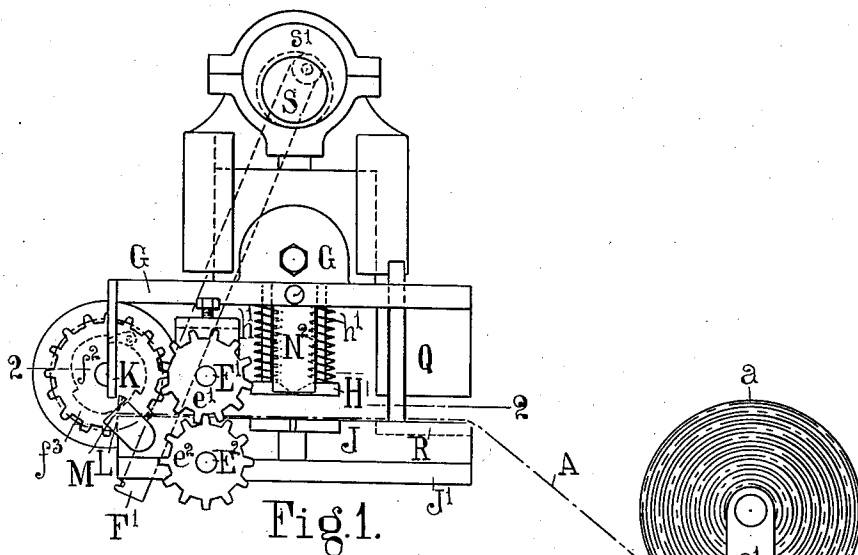
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2,054,584

APPARATUS FOR MAKING CAPSULE BLANKS FOR BOTTLES

Filed Oct. 22, 1934

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

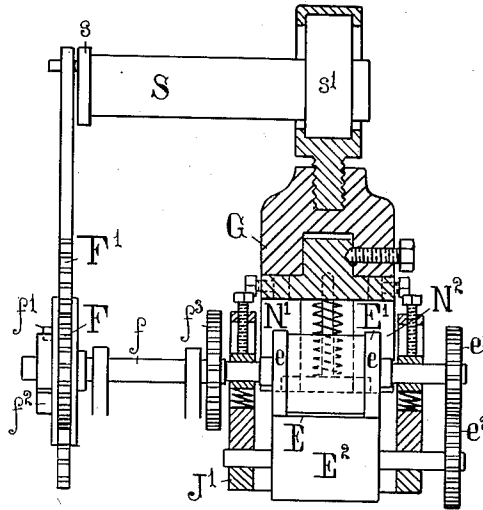


Fig. 4

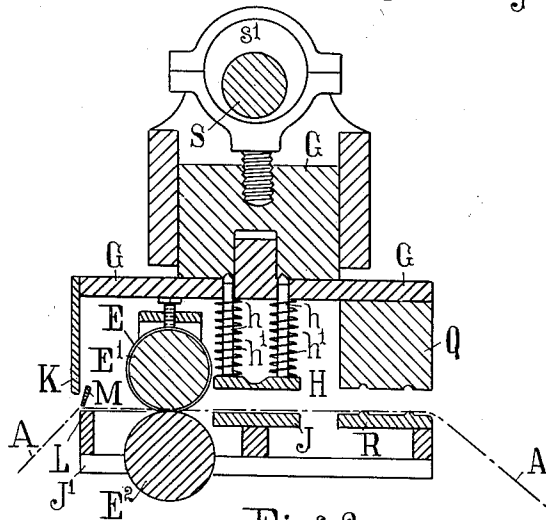
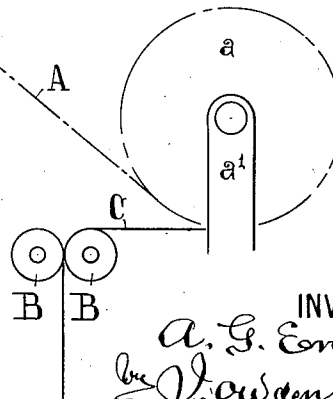


Fig. 3.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR MAKING CAPSULE
BLANKS FOR BOTTLES

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Application October 22, 1934, Serial No. 749,493
In Great Britain November 8, 1933

2 Claims. (Cl. 101—3)

This invention relates to an improved method of making light sealing pieces or blanks for capping bottles and to apparatus therefor.

There are at present two methods one or other of which are usually employed for producing the sealing pieces or blanks for sealing bottles and similar containers. In the first of these methods the pieces are provided from a strip of metal, formed into caps and placed on the bottles in the capping machine itself and in the other, which is described in the specification of my pending application for patent Serial No. 670,325 filed May 10, 1933, ready cut sealing pieces or blanks are extracted from a magazine, folded over the bottle mouth and clamped thereto. In forming the sealing pieces or blanks by either method a certain quantity of scrap metal results, as the sealing pieces are punched from sheets or rolls of material which is drawn across the dies by feed or drag rolls and the resulting scrap is wasted or fetches a low price as compared with its original value as sheet or strip. Further, in the case of metal foil under .80 millimetres thick there is a difficulty in cutting it clean by punches and dies and the edges of the sealing pieces or blanks are prone to remain partly attached to the scrap and thus to upset the action of the blanking machine and it is also difficult to detach the sealing piece of blank itself from the punches and dies.

The object of this invention is to provide a method whereby all scrap is eliminated and a square or oblong sealing piece or blank is cut from a strip by scissors or guillotine action, the strip used being the same width as the blank required so that no cutting is required at the side edges of the strip and the end transverse edges are cleanly cut through by the scissors or guillotine. Or if a sealing piece or blank with rounded corners is required such corners will be formed in the strip before the latter passes to the cutting device by the operation of the same plunger head as carries the cutting knife.

Although attempts have been made to feed a strip from feed rolls across a position where pieces of the required size may be cut off, this is only successful with a stable strip and it is found that the very light strip required for cheapness does not always follow a straight path as it emerges from the feed rolls and that it is liable to deviate to one side or the other (particularly in the case of aluminium foil) when it is not pulled through by drag rolls engaging the scrap. Moreover, the light strip is too fragile to permit of guiding it as it leaves the feeding rolls and it often crumples against the sides of such guides unless it is aided by drag rollers feeding the scrap. The difficulty experienced in feeding very thin metal foil and cutting it in the usual way by punches and dies is overcome by the

present invention according to which the strip or foil is pushed forward by rollers to the cutting device and the necessary lengths to form the capping piece cut off by the guillotine or scissor action.

In the case of extremely fragile strips of metal foil it may be interleaved on the reel on which it is wound with paper or other flexible material and the metal foil unwound therefrom by drag rollers which draw off the interleaved material.

The invention will be described with reference to the accompanying drawings in which:—

Fig. 1 is a side view of a machine for carrying out the invention.

Fig. 2 is a horizontal section on line 2—2 Fig. 1.

Fig. 3 is a vertical section on line 3—3 Fig. 2.

Fig. 4 is a part view of the machine partly in section, and

Fig. 5 is a detail of cutting edge for forming rounded corners on the blanks or capping pieces.

The reel *a* of the strip *A* of aluminium or other metal foil is supported in suitable bearing *a*¹ so that it can freely rotate thereon and when, as shown in the drawings, the strip *A* is interleaved with a strip *C* of paper or other flexible material a pair of drag rollers *B.B.* are provided, the paper strip *B* being threaded between the rollers *B.B.* The rollers *B.B.* are driven in any suitable way and serve to pull the strip *C* off the reel *a* and at the same time causes the strip *A* of metal foil to be unwound from the reel with a minimum amount of drag or tension. Where however the strip *A* of metal foil is sufficiently strong to withstand the necessary drag for unwinding it from the reel *a* the paper strip *C* may be omitted and the drag rollers *B.B.* are then not required.

The strip *A* after being unwound from the stock reel *a* is drawn over a flat plate *J* by a pair of rollers *E*¹ *E*² and fed forwardly with an intermittent motion by these rollers to the guillotine knife *K* which cuts off the desired lengths of foil. The rollers *E*¹ *E*² are geared together by the wheels *e*¹ *e*² so that they will rotate at the same speed and the top roller *E*¹ is driven from a reciprocating rack *F*¹ which engages a wheel *F* loosely mounted on the shaft *f*. The wheel *F* carries on one face a pawl *f*¹ engaging a ratchet wheel *f*² fixed on the shaft *f* on the other end of which is affixed a gear wheel *f*³ gearing with the wheel *e*³ on the shaft of the roller *E*.

The rack *F*¹ receives its motion from a crank *s* on a continuously rotating shaft *S*.

The guillotine knife *K* is carried by a reciprocating press head *G* which receives its motion from the shaft *S* by the eccentric *s*¹ mounted thereon.

The press head *G* also carries a steady plate *H* behind the rollers *E*¹ and *E*², this steady plate being slidably mounted on vertical rods *h* and

controlled by the helical springs h^1 around the rods h .

A fixed knife or blade L cooperating with the guillotine knife K is carried by the frame J¹ on which the plate J is mounted and a fixed guide M is arranged adjacent to the blade L to keep the strip A in place while the blank or capping piece is cut off.

The machine operates as follows:—The strip A is drawn forward by the rollers E¹ and E² (either with or without the cooperation of the drag rollers B.B.) with an intermittent motion derived from the pawl f^1 and ratchet f^2 . During the forward movement of the strip A the press head G is raised but during the dwell or stationary period the press head G is lowered by the eccentric e bringing the steady plate H into contact with the strip so that the latter is held between the plate H and the plate J. While the strip A is thus held the guillotine knife K which is also carried by the head G comes into contact with the strip A and cuts off a piece of the strip A. The steady plate H and the knife K are so arranged on the head H that the plate G will come into contact with the strip A before the knife K reaches its cutting position, the further downward movement of the head G after the plate H has engaged the strip being taken up by the springs h^1 . The length of capping strip A fed forward at each movement of the head G is registered by the rotation of the rollers E¹ E² which is governed by the pawl f^1 and ratchet f^2 , such length of strip being fed forward during the ascending movement of the head G. Each time the head G descends a predetermined length of strip A is consequently severed by the co-operation of the knife K and blade L and each time the head G ascends a further length of strip is fed forward to be severed at the next descent of the knife K.

The machine as hereinbefore described produces capping pieces or blanks with square corners but when pieces or blanks with rounded corners are required two punches or cutting edges N¹ N² are mounted on the head G so as to rise and fall therewith. These cutting edges are shaped as shown in Fig. 5 and at each downward stroke of the head G cut out a piece a^1 of the strip A corresponding to the rounded corners of two capping pieces (see Fig. 2). The cutting edges N¹ and N² are so disposed in relation to the rollers E¹ and E² that the line a^2 (shown in dots in Fig. 2) connecting the two rounded portions at each edge of the strip C will exactly coincide with guillotine knife K. When that portion of strip A has been moved forward to the cutting position thus producing blanks with rounded corners.

If desired the strip A may be embossed with any desired lettering or pattern and for such embossing a punch Q is carried by the press head G which presses the strip upon the embossed die R. The punch Q thus rises and falls with each movement of the press head G and the strip is accordingly embossed for each forward movement thereof.

The punch Q and die R are preferably arranged to emboss the strip before the latter passes between the rollers E¹ E² and to prevent the embossing from being flattened or damaged while the strip is passing between the rollers E¹ and E² one of the latter, preferably the top rollers E¹ is

provided with an annular recess E and the actual feeding forward of the strip is accompanied by the two parts e of larger diameter.

The method of producing bottle capping pieces or blanks as hereinbefore described may be employed for producing blanks which are packeted for use in capping machines of the type described in the specification of my prior application for patent Serial No. 670,325, or for feeding direct to the bottle capping position in such capping machines, in which case the magazine and vacuum appliances for moving and holding the capping pieces or blanks are omitted. Or the invention may be employed for providing blanks to the cap forming positions in other types of machines in which the caps are at present stamped or drawn on the machine and then placed upon the bottles.

Where the invention is used for producing blanks for packeting it may be combined with collecting or piling appliances or means such as chutes or travelling conveyors for delivering the blanks into cartons or other containers.

The stock roll a of the strip A, whether interleaved or not with a strip C of paper or other material may be enclosed in a heated chamber raised to a sufficient temperature to sterilize the foil and/or to change its nature. Also in some cases the severed capping pieces or blanks may fall onto a band or conveyor which conveys them through a heated chamber for a similar purpose.

What I claim as my invention and desire to protect by Letters Patent is:—

1. A machine for making cap pieces or blanks from thin metal foil comprising a pair of feed rollers, one of which is recessed, at the delivery end of the machine to feed the foil forward intermittently, a reciprocating rack to impart the intermittent movement to the feed rollers, a continuously rotating crank to impart motion to the rack, a flat plate over which the foil is drawn by the feed rollers, a guillotine knife at the delivery end of the machine to cut off predetermined lengths of foil, a press head upon which the guillotine knife is mounted, a fixed knife or blade co-operating with the guillotine knife, a steady plate carried by the press head to hold the foil during the cutting operation, a reciprocating cutting device carried by the press head to cut out curved portions from the strip prior to the severing thereof by the guillotine knife and a punch and die to emboss the strip before passing through the feed rollers.

2. A machine for making cap pieces or blanks from thin metal foil comprising a pair of feed rollers one of which is recessed at the delivery end of the machine to feed the foil forward intermittently, a reciprocating rack to impart the intermittent movement to the feed rollers, a continuously rotating crank to impart motion to the rack, a flat plate over which the foil is drawn by the feed rollers, a guillotine knife at the delivery end of the machine to cut off predetermined lengths of foil, a press head upon which the guillotine knife is mounted, a fixed knife or blade co-operating with the guillotine knife, a steady plate carried by the press head to hold the foil during the cutting operation, and a reciprocating cutting device carried by the press head to cut out curved portions from the strip prior to the severing thereof by the guillotine knife.

ARTHUR GUY ENOCK.