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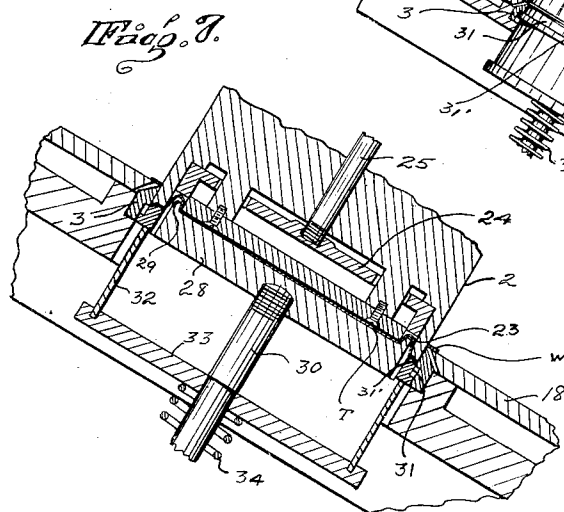
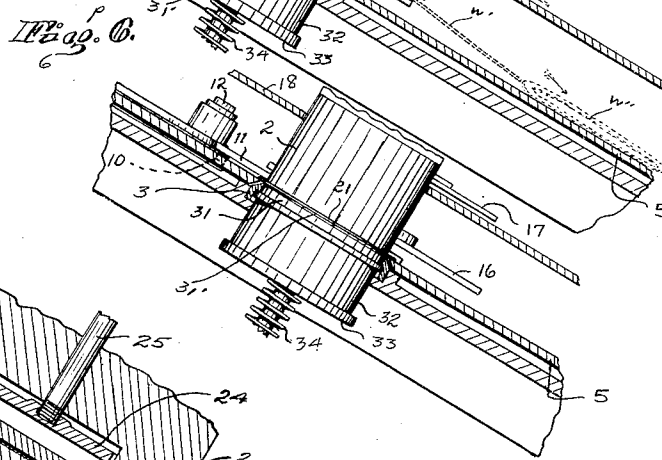
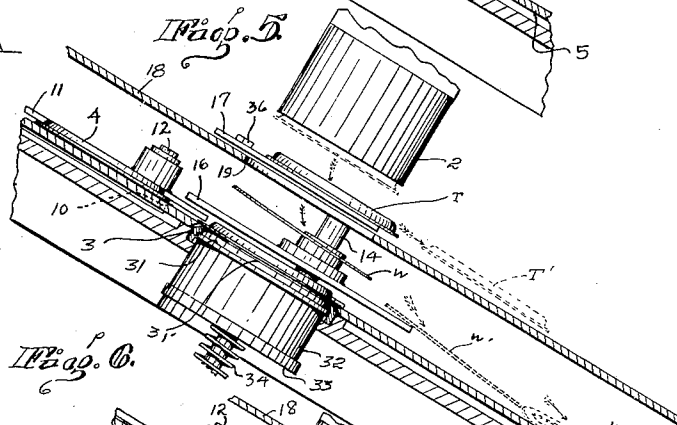
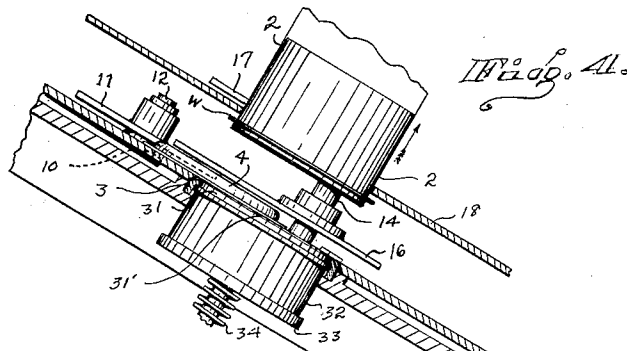
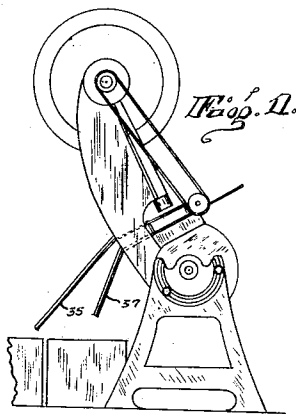
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TRIMMING AND STRIPPING PUNCH

Filed June 26, 1928

2 Sheets-Sheet 1



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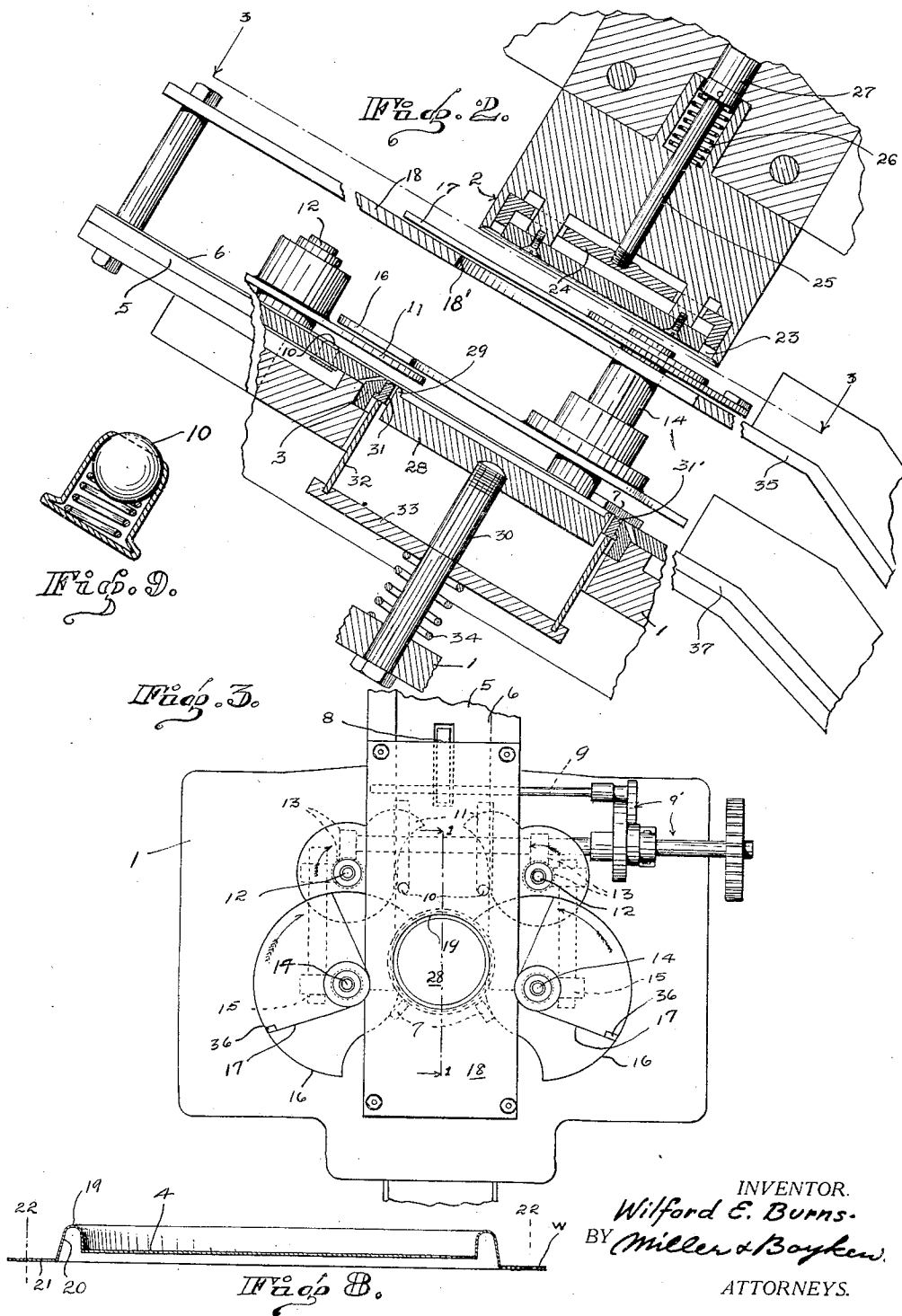
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UNITED STATES PATENT OFFICE

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TRIMMING AND STRIPPING PUNCH

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This invention relates to the manufacture of tin cans and particularly to a special trimming and stripping punch for trimming the previously formed can lids so that they will be of correct size preparatory to double seaming them to the can bodies.

The objects of the invention are to provide apparatus of the kind outlined which will automatically operate on the lids as mentioned and which will separate the trimmed lids from the trimmings or waste and discharge the lids and waste into separate receivers, and which apparatus will be reliable in operation.

Briefly described the apparatus comprises a punch press of common construction provided with a downwardly slanted guide in which the untrimmed can lids are fed, automatic means for positioning the lids one at a time between cutting die members, means for operating the die to bring its members together to trim the edges of the lid, means for separating the trimmed lid from the waste, and movable guard or ejector plates arranged to prevent waste or lid from falling back into the die elements and for ejecting the waste and lid respectively into different chutes.

Other features of the invention are disclosed in the following specification and accompanying drawings.

In the drawings Fig. 1 is a side elevation of the complete press. Fig. 2 is an enlarged vertical section taken through the die elements thereof. Fig. 3 is a reduced plan view of the lower part of the apparatus as seen from the line 3—3 of Fig. 2. Fig. 4 is a sectional side elevation of the press showing the die elements separated and a can lid sliding downward into position. Fig. 5 is a similar view to that of Fig. 4 but shows the lid in place ready for the dies to close upon it, and the view also indicates the previous lid operated on, and in dotted lines the discharge of the previous lid and trimmed off waste.

Fig. 6 shows similarly to Fig. 5 another step in the operations and wherein the dies have closed upon a lid, while Fig. 7 is a somewhat enlarged showing of the dies with the lid tightly between the die members after the waste has been sheared from the edge of the

lid in the form of a ring around the upper die member. Fig. 8 is a substantially full size cross section of one size of lid to be trimmed. Fig. 9 is an enlarged vertical section of a common spring friction or detent button used on the lid feeding guide of the machine.

In further detail the body of the press 1 carries an upper reciprocally mounted die member 2 and a lower fixed annular complementary die member 3 fitting over the member 2 to shear off the outer edge from a sheet metal can lid 4 to accurately shape the body of the lid to the required size.

These die members are mounted on the press at an angle to the vertical in the well known manner as shown and a downwardly slanted plate 5 with side walls 6 arranged to overhang the margins of the can lid serves for guiding the lids, fed at the upper end of the plate or guide downwardly by gravity to the die members for trimming off the edge of the lid, and when a lid is down to trimming position it rests against a pair of stops 7.

However, the lids are not free to slide all the way down the guide to trimming position but are arrested at a point in advance of this position by a resiliently actuated or friction clamp 8 which intermittently presses upward from below on each lid to hold the row of lids above until a lid in advance is trimmed.

This clamp 8 may be a leaf spring as designated by the numeral, projecting into a slot in plate 5 and intermittently forced outward by means of a shaft 9 provided with a flat spot or its equivalent for releasing the spring at the required intervals. The shaft is actuated through transmission elements 9' in time with and by the press mechanism in any desired manner not detailed as being well understood and involving no invention.

Upon release of the clamp 8 the lid held thereby slides down and stops against two spring stops 10 which may be common spring detent buttons as indicated clearly in Figs. 2 and 9, and of which the spring buttons designated by the numeral protrude slightly through the plate 5 and are rounded on top so that a lid stopped against them can be made to pass them by slight force and thereby depress the stops, and to apply which

force a pair of rotating flat jaws 11 lying just above the plate 5 and mounted for rotation on upwardly projecting shafts 12 is actuated in time with the clamp 8 through suitable gearing 13. These jaws swing around in the direction of the arrows to engage a lid fallen from the clamp 8 and force it over the stops 10 to fall further to stops 7.

At the sides of the guide adjacent the trimming position of the lid is another pair of upwardly projecting shafts 14 also geared as at 15 to operate in time with clamp 8 and jaws 11, and mounted on these shafts are disk segments or flat plates 16, 17 rotatable in the direction of the arrows.

These disk segments or plates are spaced above one another, segments 16 being in a plane just above the guide to clear the lids passing along, and segments 17 being in a plane just above a fixed plate 18, while the flat jaws 11 rotate in a plane to engage the lids just beneath the segments 16.

Plate 18 is a fixedly mounted stripper plate and is provided with an aperture 18' to freely pass the die member 2 and also a trimmed lid, but not the waste or ring trimmed therefrom, hence will strip the waste from the die member 2.

The form of the can lid or head to be trimmed should now be considered and while it may be of various forms with suitable modification of the die faces, in the present showing it takes the form shown in cross section in Fig. 8 and wherein it is a disk 4 with a circumferential ridge 19 forming on the other side a circumferential recess 20 and extending beyond which is a margin 21 which it is desired to trim off to the required size at 22.

The upper die member 2 is formed with a recess 23 to snugly receive the ridge 19 of the lid and within the die is a reciprocally mounted kick-off plate 24 active against the upper edge of the ridge 19 and provided with a stem 25 normally drawn upward by a spring 26, and forced outwardly at the raised position of the die member 2 by a cam operated plunger 27 or otherwise actuated in time with the press elements in the well understood manner not detailed herein as not involved in the invention.

The lower die member 3 is provided with a plate 28 having an annular rim 29 formed around its upper surface of a size to freely enter the recess 20 of the lid, and the plate 28 is held in fixed position on an adjusting bolt 30 carried by the frame of the press.

Between the rim 29 and inner wall of annular die member 3 is a reciprocally mounted die ring 31 carried on a tubular support 32 in turn resting on a disk 33 resiliently forced upward by a spring 34 surrounding the bolt 30 so that the die ring 31 may be forced downward against the resistance of the spring.

This die ring 31 is outwardly beveled as indicated at 31' and the upper die member is

made complementary so that after the waste is sheared from the lid by the inner cutting edge of die member 3 the lid in still further descent of the die 2 will be clamped against member 31 (as shown in Fig. 7) and the edge of the trimmed lid forced downward over the bevel 31' to thus reduce the outer diameter of the trimmed lid and thereby enable it to freely pass the hole 19 in the stripper plate with the rising plunger or die 2, it being understood that the rim 29 fitting freely into the recess 20 of the lid forces the ridge 19 tightly into the recess 23 of the upper die member so that after trimming the lid will be frictionally held in recess 23 and be lifted with the plunger through the stripping plate 18.

In operation a lid is positioned over the lower die as described, the plunger descends, trims the lid, reduces its diameter slightly by forcing its edge against the bevel 31', engages the lid in recess 23, lifts the lid, strips the waste against plate 18, and kicks off the lid above the plate 18, and during the above operations the revolving segments 16 swing across the lower die to thereby cover the same to receive the falling waste ring (as shown at W in Fig. 5) and quickly following this the segments 17 swing across the plate 18 covering its opening 19 to thereby prevent the kicked off trimmed lid (T in Fig. 5) from falling back into the hole, and since the segments 17 are revolving they eject the trimmed lid down an upper chute 35 or continuation of plate 18, (as indicated at T' in Fig. 5) ejecting lugs 36 on disks 17 assisting this operation.

Likewise the disk 16 revolving towards one another after receiving the waste ring W discharge it successively to positions W', W'' down a chute 37 or continuation of guide plate 5 under the chute 35 and therefore completely separated from the trimmed lid, hence the lids and waste are automatically separated and discharged to separate containers.

As the operation of punch presses of this kind is well understood any description of the plunger operating connections, clutch and controls, has been omitted as unnecessary, since this may vary greatly in different presses and the invention is confined only to the automatic positioning of the lids and manner of trimming and separating of the waste and lids and preventing their falling back into the die members during ejection.

I claim:

1. In a reciprocable punch press provided with upper and lower complementarily formed trimming dies and means for intermittently operating the dies, means for feeding sheet units to the dies for trimming, an apertured stripper plate through which the upper die passes arranged and adapted to strip the trimmed material therefrom upon its opening movement, means actuated to move in time with the press arranged and adapted to cover the lower die and prevent

the stripped material from falling into the lower die.

2. In a reciprocable punch press provided with upper and lower complementarily formed trimming dies and means for intermittently operating the dies, means for feeding sheet units to the dies for trimming, an apertured stripper plate through which the upper die passes arranged and adapted to strip the trimmed material therefrom upon its opening movement, means actuated to move in time with the press arranged and adapted to cover the lower die and prevent the stripped material from falling into the lower die said last mentioned means actuated to move in direction of discharge to thereby throw out the waste material from the press.

3. In a reciprocable punch press provided with upper and lower complementarily formed trimming dies and means for intermittently operating the dies, means for feeding sheet units to the dies for trimming, an apertured stripper plate through which the upper die passes arranged and adapted to strip the trimmed material therefrom upon its opening movement, means for holding the trimmed unit on the upper die for withdrawal therewith, means for releasing said unit from the upper die when withdrawn, and means actuated to move in time with the press arranged and adapted to overlie the opening in said stripper plate and prevent the released unit from falling through into said opening.

4. In a reciprocable punch press provided with upper and lower complementarily formed trimming dies and means for intermittently operating the dies, means for feeding sheet units to the dies for trimming, an apertured stripper plate through which the upper die passes arranged and adapted to strip the trimmed material therefrom upon its opening movement, means for holding the trimmed unit on the upper die for withdrawal therewith, means for releasing said unit from the upper die when withdrawn, and means actuated to move in time with the press arranged and adapted to overlie the opening in said stripper plate and prevent the released unit from falling through into said opening, said last mentioned means actuated to move in direction of discharge to thereby throw out said unit from the press.

5. In a reciprocable punch press provided with upper and lower complementarily formed dies and means for intermittently operating the dies, a stripper plate apertured to pass one of the dies in the actuation of the press, a plate arranged and adapted to move across the lower die under said stripper plate, and means for actuating said plate to so move upon opening of the dies.

6. In a reciprocable punch press provided with upper and lower complementarily formed dies and means for intermittently op-

erating the dies, a stripper plate apertured to pass one of the dies in the actuation of the press, a pair of plates arranged and adapted to move across the lower die under said stripper plate, and means for actuating said plates to so move upon opening of the dies.

7. In a reciprocable punch press provided with upper and lower complementarily formed dies and means for intermittently operating the dies, a stripper plate apertured to pass one of the dies in the actuation of the press, a plate arranged and adapted to move across the lower die under said stripper plate, and means for actuating said plate to so move upon opening of the dies, said plate being formed and adapted to eject from the press any material falling thereon.

8. In a reciprocable punch press provided with upper and lower complementarily formed dies and means for intermittently operating the dies, a stripper plate apertured to pass one of the dies in the actuation of the press, a plate arranged and adapted to move across the lower die under said stripper plate, and means for actuating said plate to so move upon opening of the dies, a second plate arranged and adapted to move above and across the opening in said stripper plate, and means for actuating said second plate to so move when the dies are opened.

9. In a structure as specified in claim 5, the last mentioned means including a revolvable shaft on which said plate is secured, and a second plate on said shaft arranged and adapted to swing over the aperture in the stripper plate when the dies are opened.

10. In a punch press inner and outer trimming dies arranged for moving relatively upon operation of the press whereby a unit placed therebetween may be trimmed, a third die member cooperating with one of said dies formed to reduce the outer diameter of the unit by further motion of the press after said unit is trimmed as specified.

11. In a reciprocable punch press provided with upper and lower complementarily formed trimming dies, means for feeding sheet units to the dies for trimming, an apertured stripper plate through which the upper die passes arranged and adapted to strip the trimmed material therefrom upon its opening movement, means cooperating with one of said dies formed, arranged and adapted to reduce the projected area of said unit after trimming and before stripping.

12. In a punch press, a ring trimming die, a second die fitting and movable into and out thereof for forcing a unit to be trimmed therethrough, and a die member within the ring die formed, arranged and adapted to cooperate with said second die for reducing the projected area of a unit trimmed by said ring and second die.

13. In a punch press, a ring trimming die, a plunger die fitting and movable into and out

of said ring trimming die for trimming the outer margin of a can lid having a circumferential ridge and said plunger die having a circumferential groove arranged and adapted to receive said ridge tightly to frictionally hold said lid.

14. In a punch press, a ring trimming die, a plunger die fitting and movable into and out of said ring trimming die for trimming the outer margin of a can lid having a circumferential ridge and said plunger die having a circumferential groove arranged and adapted to receive said ridge tightly to frictionally hold said lid and means for forcing said ridge tightly into said groove.

15. In a punch press, a ring trimming die, a plunger die fitting and movable into and out of said ring trimming die for trimming the outer margin of a can lid having a circumferential ridge and said plunger die having a circumferential groove arranged and adapted to receive said ridge tightly to frictionally hold said lid, means for forcing said ridge tightly into said groove, and means for kicking out said ridge from said groove when the dies are separated.

16. In a punch press an inclined gravity feed guide for units to be operated upon, means for positioning a unit from said guide in the press for operation thereon, and a resiliently actuated stop arranged and adapted to impinge a following unit in the guide for arresting its movement until a preceding unit has been operated upon.

17. In a punch press an inclined gravity feed guide for units to be operated upon, means for positioning a unit from said guide in the press for operation thereon, and a resiliently actuated stop arranged and adapted to impinge a following unit in the guide for arresting its movement until a preceding unit has been operated upon, and means arranged and adapted to force the following unit to position for operating upon.

18. In a punch press, a pair of dies arranged for operating on units, a guide along which the units are fed to the dies, and a plurality of movable plates along the guide arranged and adapted to swing at different intervals over the guide whereby to control the movements of said units.

19. In a punch press for trimming units of sheet material, a guide in which units may be fed to the press, a pair of discharge chutes, and means whereby the trimmed units and waste are discharged into separate chutes comprising a plurality of plates revolvable respectively in the paths of the waste and units to intercept the same and eject them from the press, and means for revolving the plates.

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