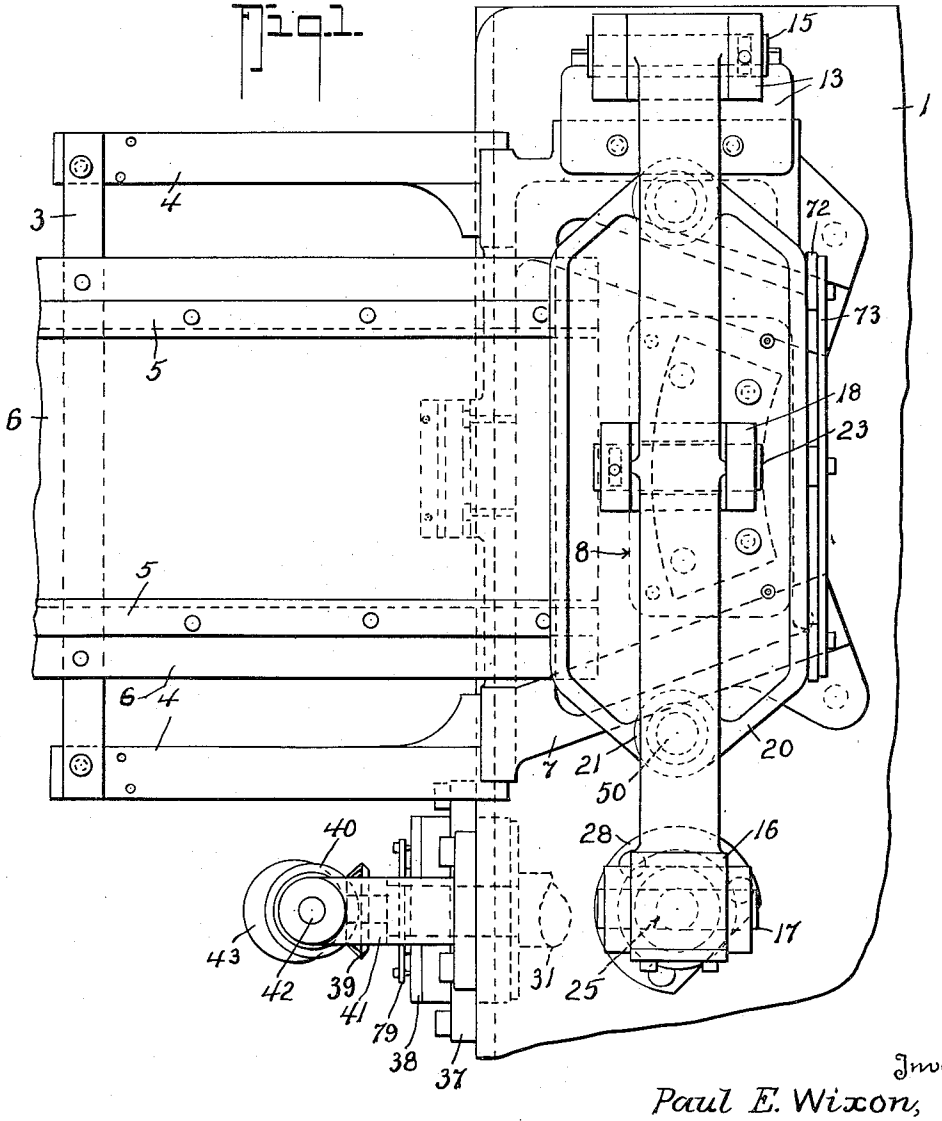
March 13, 1951 P. E. WIXON ET AL 2,545,401

MECHANISM FOR DIE-CUTTING BODY-BLANKS FROM CONTINUOUS STRIP MATERIAL

Original Filed Jan. 6, 1948 4 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

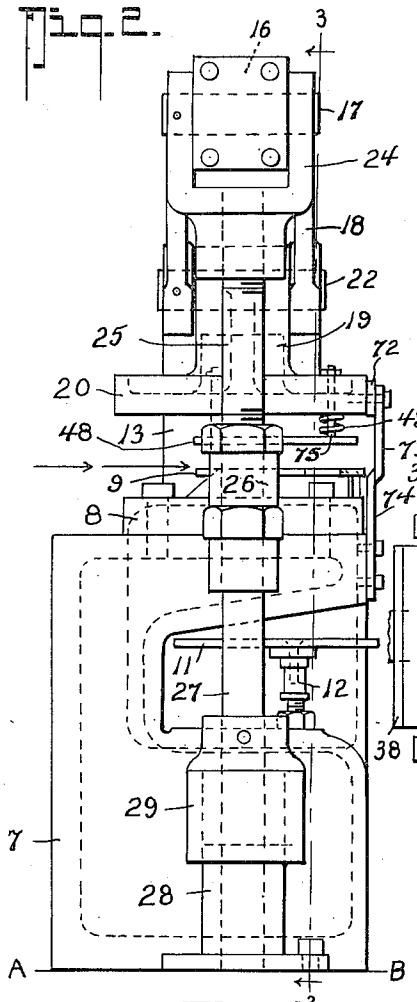


Fig. 2A.

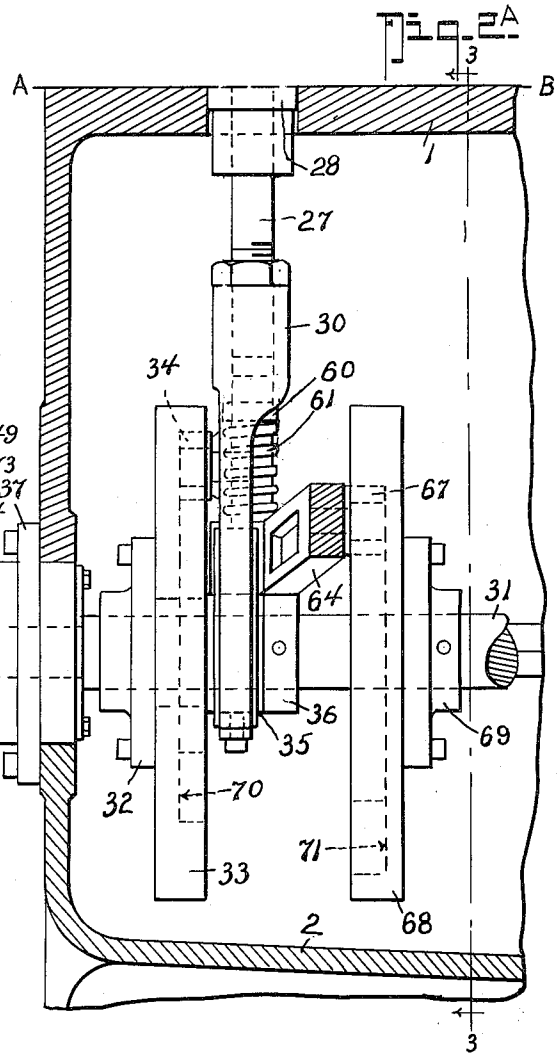


Fig. 4.

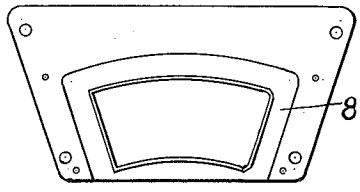
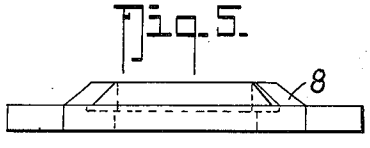


Fig. 5.



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Original Filed Jan. 6, 1948 4 Sheets-Sheet 3

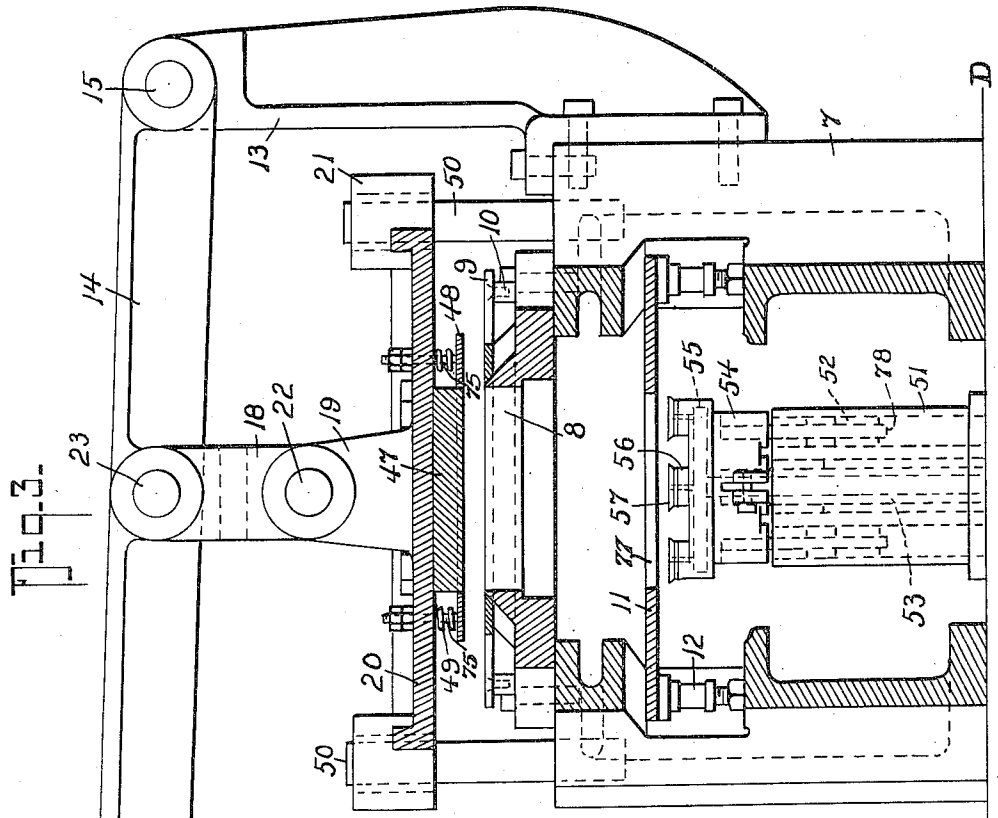


Fig. 3.

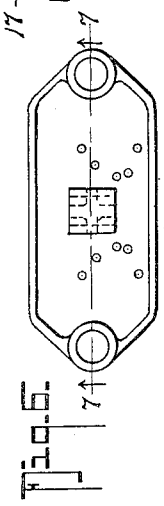


Fig. 6.

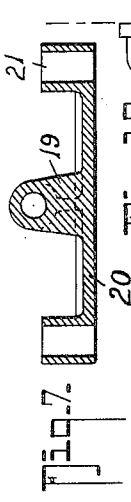


Fig. 7.

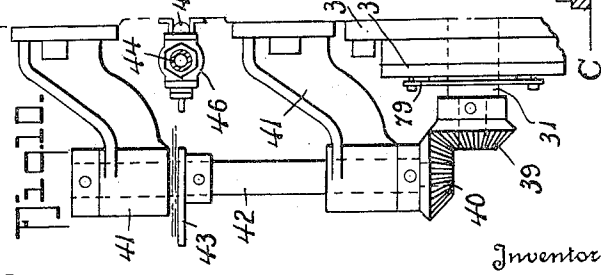


Fig. 10.

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MECHANISM FOR DIE-CUTTING BODY-BLANKS FROM CONTINUOUS STRIP MATERIAL

Original Filed Jan. 6, 1948 4 Sheets-Sheet 4

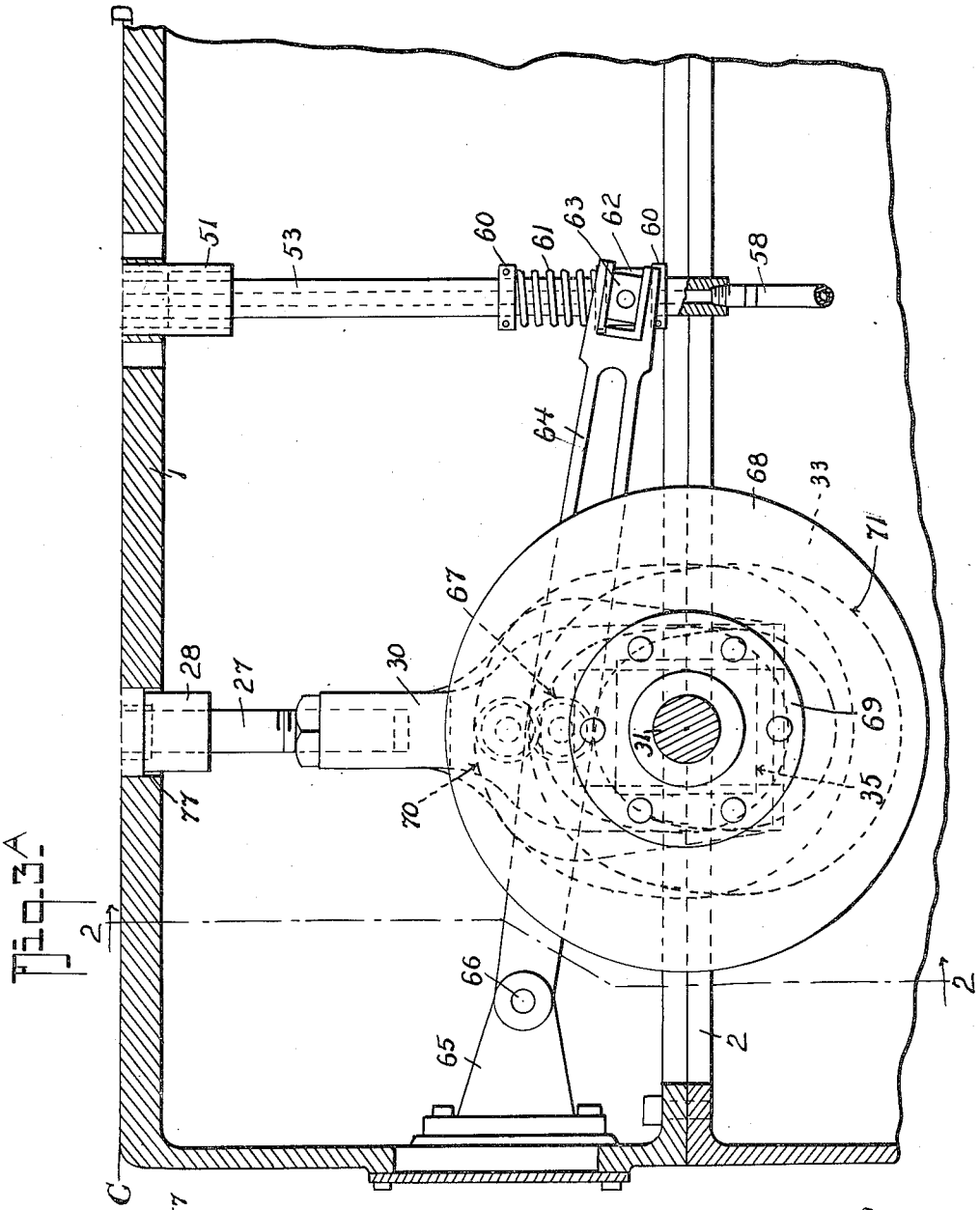


Fig. 3A.

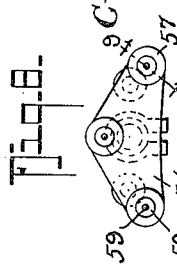


Fig. 8.

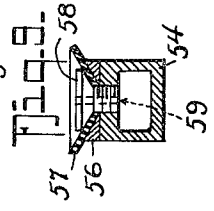


Fig. 9.

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UNITED STATES PATENT OFFICE

2,545,401

MECHANISM FOR DIE-CUTTING BODY BLANKS FROM CONTINUOUS STRIP MATERIAL

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Original application January 6, 1948, Serial No. 748. Divided and this application May 23, 1949, Serial No. 94,891

2 Claims. (Cl. 164—25)

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Our invention relates to improved means for die-cutting cup body-blanks from strip sheet material and removing or discharging the cut blanks from the dies.

In the drawings,

Fig. 1 is a top plan view illustrating our invention.

Figs. 2 and 2ª when connected on the line A—B constitute a section on the line 2—2 of Fig. 3ª.

Figs. 3 and 3ª when joined on the line C—D constitute a section on the line 3—3 of Figs. 2, 2ª.

Fig. 4 is a plan view, on a reduced scale, of the female die.

Fig. 5 is an elevation of the same.

Fig. 6 is a top plan view of the punch plate.

Fig. 7 is a section of the same on the line 7—7 of Fig. 6.

Fig. 8 is a detail top plan view of the blank picker head on a reduced scale.

Fig. 9 is a cross section on a larger scale on the line 9—9 of Fig. 8.

Fig. 10 is a detail side elevation of a portion of the apparatus showing the suction valve and its operating cam mechanism.

In the drawings in which like numerals of reference indicate like parts in all the figures, 1 indicates a portion of the upper half of the base of a cup making machine and 2 represents a portion of the lower half of the same.

On brackets 4 and cross supports 3, is a plate 6 forming a paper feed table. Paper guide bars 5 are provided to center the paper and guide the same along the table to the blanking mechanism. Mounted on the upper part 1 of the base of the machine is a die holding stand 7 to one face of which the bottom half 14 of a waste paper cutter is secured, the top half 13 of which is mounted on a punch plate 20, spacers 12 being provided so as properly to line up the cutting blades 13 and 14 (see Fig. 2).

The blanking die 8, with which a blanking punch 47 cooperates, is mounted on the die holding stand 7. A waste paper guide plate 9 encircles the upper end of the die 8 and is mounted on spacers 10. The waste paper is advanced (in any approved way) between the cutting blades 13, 14 after each blanking operation.

Rigidly secured to the bottom face of the punch plate 20 is the punch or male die 47 and surrounding the die is a blanking punch stripper plate 46, yieldably mounted on guide pins 5 and springs 49, beneath the punch plate 20 and serves to prevent the paper, from which the blank was punched, from lifting with the die, i. e., the plate 48 holds the paper down on the plate 9 while the

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punch 47 is functioning and until it is withdrawn from the die 8.

Secured to a collar 32 on a shaft 31 of the machine is a blanking cam 33. Adjacent the cam 33 on shaft 31 is a press lever operating fork slide block 35 and a collar 36. A fork 30 cooperates with the slide block 35 and carries a roller 34 to run in the cam groove 70 of the cam 33. The lower half 27 of a press lever operating rod is screwed into the fork 30 and passes through a bushing 28 that projects through and serves as a plug for a hole in the base 1. The rod 27 carries a dust cap 29 to fit over the upper end of the bushing 28 (see Figs. 2, 2ª). The lower section or half of the press lever operating rod 27 is coupled to the upper section 25 by an adjustable coupling nut 26, the upper end of the rod section 25 has a clevis 24 that is pinned, at 17, to a press lever 14. As best shown in Fig. 3 the press lever 14 is pivoted on a pin 15 that is carried by a bracket 13 mounted on the top of the base section 1.

The punch plate 20 is slidably mounted, for up and down movement, on guide pins 50 that are mounted on the base and pass up through punch plate guides 21. The plate 20 also has an apertured lug 19 for a link pin 22 to the ends of which a forked link 18 is pivoted, the link being also pivoted on a pin 23 carried by the lever 14.

The press lever 14 has a forked end 16.

Secured to the base is a shaft bearing housing 37 containing a packing housing 38 and cover 79.

Cooperating with the punch mechanism is a blank picker whose purpose is to take the punched blank immediately upon severance of the blank from the paper strip and detach it from the face of the punch (when it adheres thereto) so that the blank may be released from the punch, before the punch rises, and brought down onto a table top 11.

Referring now more particularly to Figs. 2, 2ª, 3, 3ª and 10 it will be seen that 51 indicates a picker shaft guide which is mounted on the base part 1 and projects through the hole 77. Mounted for up and down movement in the guide 51 is a hollow picker shaft 53 which carries a hollow blank picker head 54 that operates in the blanking die 8.

The head 54 is of triangular form in plan view (Fig. 8) and is provided with three rubber suction cups 57 held to the head 54 by screws 58 which have bores 59 to effect communication between the cups 57 and the interior air chamber 55 of the head 54 (Fig. 9). 56 is a spacer for the cup 57.

The head 54 is also provided with pilot rods 78 which work up and down in bearings 52 in the guide 51 (Fig. 3). A suction or vacuum hose 58 is connected to the lower end of the shaft 53, and functions in a manner later to be explained.

Fulcrumed on a stud 66 carried by a bracket 65 that is secured to a side wall of the base section 1, is a picker cam lever 64 that has a cam roller 67 to cooperate with a picker cam 68 secured to a hub 69 that is fast on the cam shaft 31.

Mounted slidably on the shaft 53 is a trunnion 62 with which a trunnion block 63 in the fork of lever 64 cooperates. The shaft 53 has a pair of collars 60 fixed to the shaft and a safety spring 61 that engages the block 62.

The table top 11 is supported on suitable supports 12.

Journalled in bearing brackets 41 is a vertical shaft 42. The shaft 42 is driven from the shaft 31 through bevel gears 39, 40. On the shaft 42 is a cam 43 which operates a picker suction control valve 46, the valve being connected to a duct 44 and to a pipe 45 from a suitable source of suction (as, for example, a vacuum pump) not shown.

In operation the paper strip from which the cup blanks are to be punched is fed through between the punch and die and over the guide 9 intermittently.

As shown the cams 33 and 68 are so arranged that as the punch comes down the picker head raises to meet the punch as soon as the punch has entered the die at which time cam 43 opens valve 46 and the punched blank is caused to adhere to the cups 57. The suction remains on until the cups are lowered level with table top 11 whereupon the cam 43 leaves the valve 46 to permit it to close again.

As the picker goes down the punch goes up again and the paper strip is advanced to bring an unpunched portion into position.

As the punch punches out the blank the cutters 74, 73 will shear off the paper end from which a previous blank was punched.

The use of the picker is necessary in order to insure the proper functioning of the punch, for should any punched blank adhere to the face of the punch and go up with it, the blank would not be released properly.

This application is a division of our application filed January 6, 1948, Serial No. 748.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction, operation and advantages of the invention will readily appear to those skilled in the art.

What we claim is:

1. In a machine of the class described, a base, a cam shaft journalled in bearings in said base, a blanking cam on said cam shaft, a press lever operating a rod bushing in said base, a press lever operating rod reciprocatively mounted in said bushing, a cam roller fork carried by said rod and having a roller to engage said cam, a fork slide block on said cam shaft, a die holding stand mounted on said base, a press lever pivotally mounted on said stand and pivotally connected with said press lever operating rod, a blanking die mounted on said stand beneath said press lever, a punch plate located above said die, punch plate guide pins carried by said stand, said punch plate having guides to ride said pins, a link connecting said punch plate with said press lever, a blanking punch carried by said punch plate, a suction picker operatively mounted on said base for up and down motion in said die in cooperation with said punch, a suction control valve operatively connected with said picker and a cam on a shaft driven by said first mentioned cam shaft and mounted in bearing brackets on said base, for operating said control valve in timed relation to the operation of said punch.

2. In a machine of the class described, a base, a cam shaft journaled in bearings in said base, a blanking cam on said cam shaft, a die holding stand mounted on said base, a blanking die mounted on said stand, a punch plate located above said die, punch plate guide pins carried by said stand, said punch plate having guides to ride said pins, a blanking punch carried by said punch plate, means cooperating with said cam shaft for operating said punch plate and punch, a suction picker operatively mounted on said base for up and down motion in said die in cooperation with said punch, a suction control valve operatively connected with said picker and a cam on a shaft driven by said first mentioned cam shaft and mounted in bearing brackets on said base for operating said control valve in timed relation to the operation of said punch.

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