Jan. 25, 1955 J. SULGER 2,700,450

AUTOMATIC FEED MECHANISM FOR EXTRUSION PRESSES

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Fig. 1

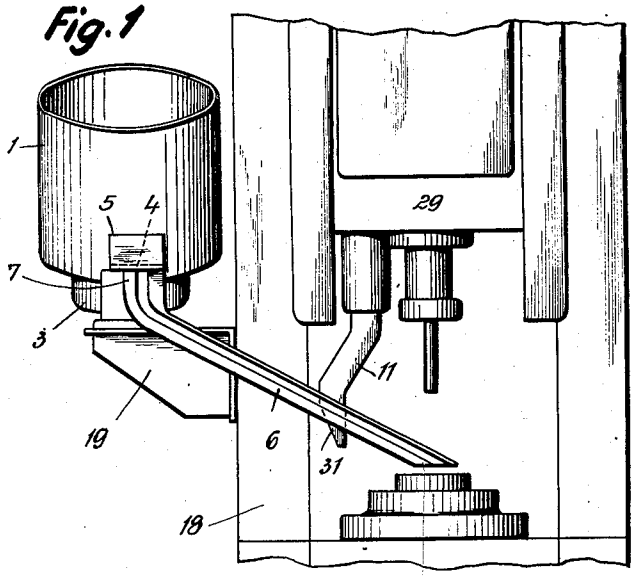


Fig. 2

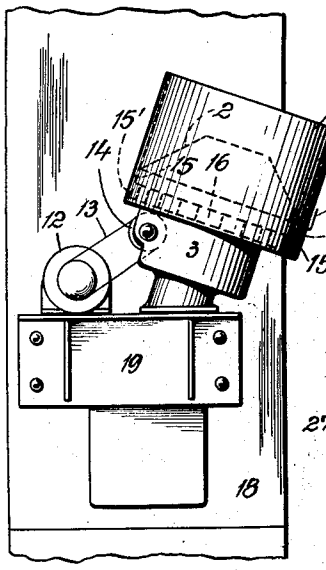
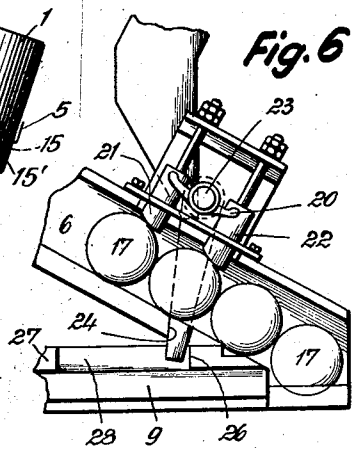


Fig. 6



INVENTOR
Jakob Sulger

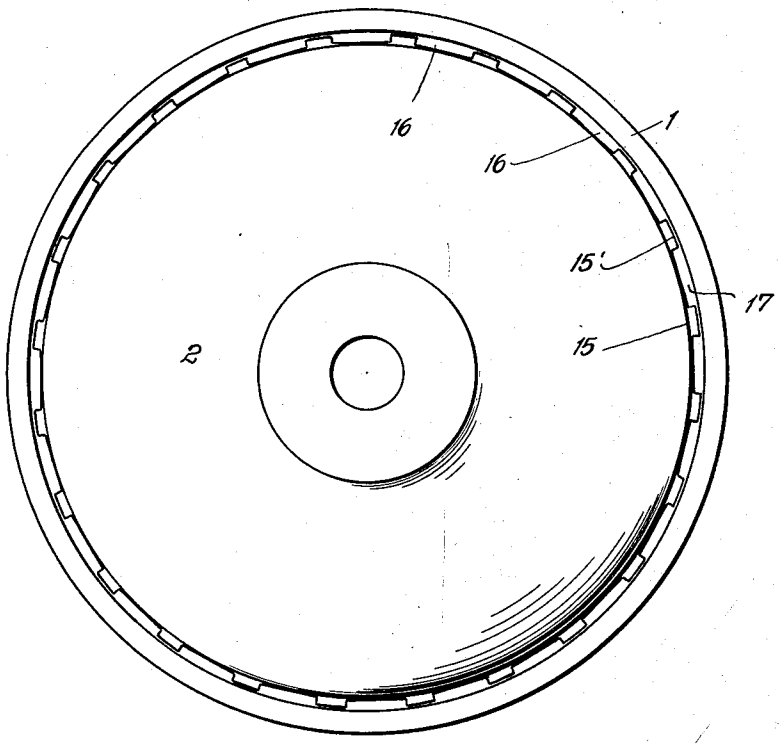
BY Young, Emery & Thompson
ATTORNEYS

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Fig. 3



INVENTOR
Jakob Sulger

BY
Young, Emery & Thompson
ATTORNEYS

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Fig. 4

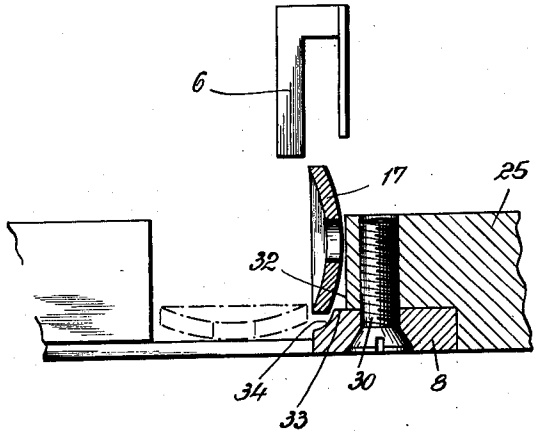
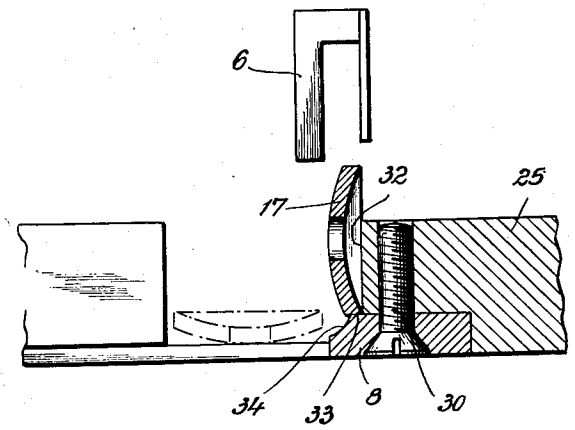


Fig. 5



INVENTOR
Jakob Sulger

BY
Young, Emery & Thompson
ATTORNEYS

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AUTOMATIC FEED MECHANISM FOR EXTRUSION PRESSES

Jakob Sulger, Goppingen, Germany, assignor to L. Schuler, A.-G. Goppingen, Wurttemberg, Germany, a corporation of Germany

Application August 22, 1951, Serial No. 243,137

Claims priority, application Germany August 30, 1950

2 Claims. (Cl. 198—33)

This invention relates to mechanisms for feeding to a press or other machine tool, circular blanks, particularly arched or cupped blanks, lying in horizontal position, and to mechanisms of this type comprising a hopper for the blanks, a guide channel into which they pass from the hopper, and means for moving the blanks issuing from said channel to the work place in the machine tool.

According to the present invention the guide channel delivers the blanks, rolling on their circumferential edges, to a gate device having bottom and side blank contacting surfaces of which the bottom surface is a ledge narrower than the depth of arching of the blanks, which gate device cooperates with a control slide reciprocable laterally of the gate device and having a side wall spaced by about the depth of a blank from the said side surface of the gate device, and a stationary surface below the said control slide which receives a blank released from the gate device by action of said slide, and deposited on said stationary surface by tilting on or sliding over said ledge into a horizontal position with its convex surface downwards irrespective of the orientation of said convex surface when the blank enters the gate device, a second slide being arranged to deliver the horizontal oriented blank to the work place.

It is difficult to make discs flat, especially perforated discs for blanks to be treated in a press. Such discs generally have a slight arching or cupping, and are apt to arrive at the work place some with convex face downwards, some with convex face upwards, leading to non-uniform treatment by the machine tool unless the blanks are previously sorted by hand.

The primary object of the present invention is to overcome this disadvantage and to enable arched blanks to be treated in presses and the like without preliminary manual sorting, and to be automatically presented to the work place with the convex face downwards so that the result of the press operation on the blanks is uniform. The mechanism of the present invention also allows flat blanks to be treated, since it is immaterial which face of a flat blank faces downwards and the flat blanks will pass through the gate device.

The invention makes it possible to work arched blanks poured at random into a hopper, just as easily as flat or presorted blanks, since the mechanism of the invention ensures that any curved or arched blanks will be brought automatically into horizontal position with the convex side facing downwards, before delivery to the work place.

A constructional example of the mechanism embodying the invention is illustrated in the accompanying drawings which will now be described. In these drawings:

Fig. 1 is an elevational view of the general arrangement of the blank feeding mechanism on a press,

Fig. 2 is a side view of a detail,

Fig. 3 is a plan view of the blank feeding hopper, on a larger scale,

Figs. 4 and 5 are sectional views showing the action of the gate device, and

Fig. 6 is a side view partly in section, showing the blank arresting means.

In the drawings, 18 designates the frame of the press carrying a bracket 19 supporting a hopper 1 for the blanks to be worked. In the hopper is rotatably mounted a conical apron 2 driven by a belt 13 or other suitable transmission from an electric motor 12 also mounted on

the bracket, the drive means including also a drive wheel 14 and gearing 3 below the hopper 1. The conical apron 2 has a depending cylindrical skirt 15, the lower part 15' of which is formed circumferentially with a series of grooves 16 each of sufficient width to accommodate a blank 17. These grooves and the surrounding inner wall of the hopper form pockets into which the blanks, poured at random arrangement into the hopper, find their way.

The rotation of the conical apron brings the blanks 17 in the grooves or pockets 16 to an outlet opening 4 at the front of the hopper. The blanks, which are upright in the pockets, roll on their circumferential edges through this opening into a guide channel 6. The opening is partly covered by one limb of an angle plate 5 adjustable in height on the outside of the hopper, the other limb of which plate forms a tongue extending into the opening 4. The angle plate 5 is fixed at such a level that only one of the blanks advanced to the opening can enter at a time into the guide channel 6. As a safeguard against jamming, a slip coupling is provided in the drive of the apron, not shown, which coupling may consist of two friction plates urged together by a spring and included in the gearing 3. Also the belt or other drive means may be designed to slip should the torque applied by the drive wheel, become excessive. The motor then can be switched off and the source of trouble in the blank feed removed so as to avoid damage.

Near the lower end of the guide channel 6 there is arranged an arresting means for the blanks, actuated in positive dependency on the press operation. These means consist of a rock lever 20 to each end of which is pivoted a shoe 21 and 22 extending into the channel and adapted to engage a blank 17 similar to a brake shoe. The arrangement is such that at any instant only one of the shoes is in arresting contact with a blank, the other shoe being in raised, releasing position. The pivot 23 of the rock lever 20 carries an arm 24 which extends towards a control slide 9 on the table of the press, which slide has dogs 26 and 27 between which the end of the arm 24 extends in a slot 28.

When the blanks issue from the guide channel 6, they are upright and therefore roll on their circumferential edges, but the direction of presentation of the convex sides of the arched blanks is indeterminate, some blanks standing with the convex side facing one way, others with the convex side facing the opposite way. When an arched blank is fed by the slide 35 to the matrix of the press, it must always be oriented with its convex side downward. This is achieved in the following manner.

In the support 25, at the outlet of the guide channel 6, there is arranged a gate device having bottom and side blank contacting surfaces. The side surface 32 is vertical, Figs. 4 and 5, and may be a surface of the support itself, while the bottom surface 33 constitutes a narrow ledge arranged at right angles to the surface 32 and at its lower end. This bottom surface is shown as formed on a plate 8 fitted into the under side of the support 25 and held in place by a screw 30. The ledge 33 has its front face inclined or curved as shown at 34 in Figs. 4 and 5. The ledge 33 has a width narrower than the depth of arching of the blanks, so that those blanks which arrive from the channel 6 into the gate with their convex surface resting against the side surface 32 find no support on the ledge 33, Fig. 6, and slide down the surface 34 from the position shown in full lines into the position shown in broken lines.

The blanks which on rolling out of the guide channel 6 have their concave face directed to the side or vertical surface 32 of the gate, roll on to the narrow bottom surface or ledge 33, Fig. 5. Therefore such blanks, instead of sliding down the surface 34, tilt on their edges from the full line position, Fig. 5, into the broken-line position with the convex side facing downwards. Thus in both instances of Figs. 4 and 5, the blank finally lies in the path of one of the slides on the table of the press, ready to be delivered to the matrix.

The slide 9 moves laterally of the gate device 32, 33, and 34. The arresting means 21 and 22 ensure that only one blank at a time reaches the gate device, in which it comes to rest, because at this instant the slide 9 is in

front of the gate device and forms therewith a receiving chamber for the blank. As soon as the slide is retracted and opens the gate device, the blank either tilts on the ledge 33, or slides down the ramp 34, as the case may be, and comes to lie convex side downwards before the front face of the retracted slide 9. When this slide next advances, it pushes the now horizontal blank before it until the said slide is again in front of the gate device, thereby closing the chamber for the reception of the next blank. The advanced horizontal blank now arrives in the path of the delivery slide 35 which moves it to the work place for operation thereon by the tool of the press.

To prevent any choking in the feed of blanks to the work place, the operation must be such that the hopper can supply more blanks than the tool can work in the same time. Therefore the guide channel soon fills up with blanks and remains so during operation of the mechanism. An overflow slot for the excess blanks therefore is provided at 7 near the upper end of the guide channel, which blanks roll laterally out of the slot into a receptacle, not shown.

I claim:

1. A device for or orienting and feeding circular, arched blanks automatically to an extrusion press comprising a hopper into which the blanks may be poured in random disposition, a guide channel arranged to convey the blanks from the hopper, the outlet end of said channel being constructed to cause the blanks to roll on their circumference when issuing from the channel, slide means receiving the rolling blanks from said channel and conveying them to the place of treatment, and a blank turning device into which the blanks are deposited by the guide channel said blank turning device having an angular seat formed by a side and a bottom surface whereof the bottom surface has a sloping edge joined to the side surface by a ledge of a width narrower than the depth of

the arch of the blank whereby blanks deposited by the slide with the convex face towards the side surface of the turning device will slide down the sloping edge and be turned in one direction to bring the convex side underneath and the blanks having their concave side towards the side surface will tilt on said ledge in the other direction also to bring the convex side underneath, and receiving means laterally positioned relative to the blank turning device to provide a space for the blanks as they slide from the sloping edge and tilt from the ledge.

2. In a device for feeding circular and arched blanks each with concave and convex sides automatically to a press, a blank turning device into which the blanks are deposited having an angular seat formed by a side and a bottom surface whereof the bottom surface has a sloping edge joined to the side surface by a ledge of a width narrower than the depth of the arch of the blank whereby blanks with the convex face towards the side surface will slide down the sloping edge and be turned in one direction to bring the convex side underneath and the blanks having their concave side towards the side surface will tilt on said ledge in the other direction also to bring the convex side underneath, and receiving means laterally positioned relative to the blank turning device to provide a space for the blanks as they slide from the sloping edge and tilt from the ledge.

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