F. F. CLARK.

SHEET PLATE FEEDING MACHINE.

APPLICATION FILED APR. 22, 1919.

1,335,556.

Patented Mar. 30, 1920.

2 SHEETS—SHEET 1.

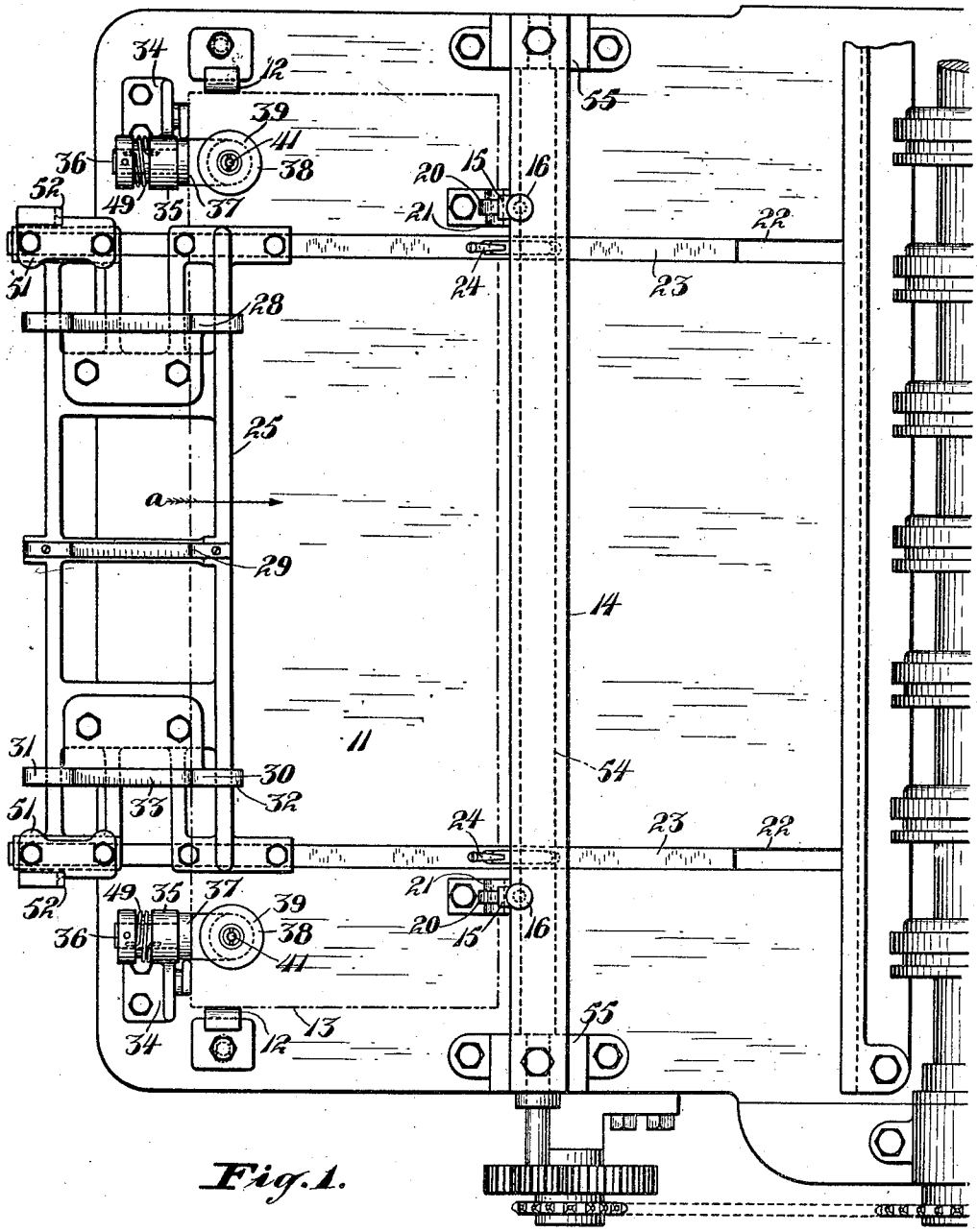


Fig. 1.

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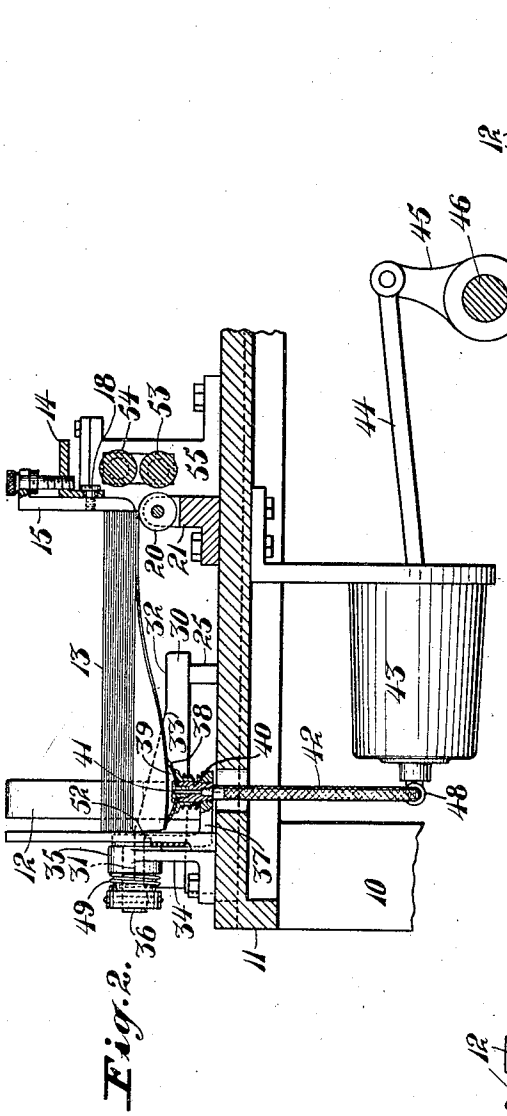


Fig. 2.

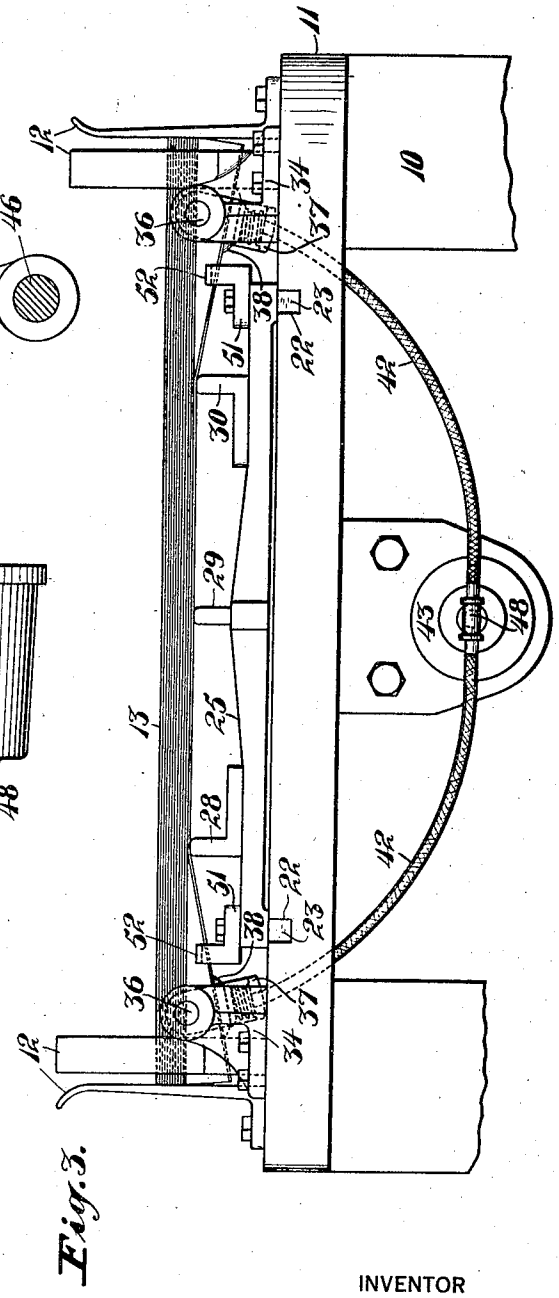


Fig. 3.

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FREDRICK F. CLARK, OF ALAMEDA, CALIFORNIA, ASSIGNOR TO ALASKA PACKERS ASSOCIATION, OF SAN FRANCISCO, CALIFORNIA.

SHEET-PLATE-FEEDING MACHINE.

1,335,556. Specification of Letters Patent. Patented Mar. 30, 1920.

Application filed April 22, 1919. Serial No. 291,813.

To all whom it may concern:

Be it known that I, FREDRICK F. CLARK, a citizen of the United States, residing at Alameda, in the county of Alameda and State of California, have invented new and useful Improvements in Sheet-Plate-Feeding Machines, of which the following is a specification.

This invention relates to a machine for feeding sheet plates, and particularly pertains to a vacuum feed mechanism therefor.

It is the principal object of the present invention to provide a sheet plate feeding mechanism which will handle plates of a large size and of thin gage, and which is equipped with a vacuum feed means whereby the plates may be segregated one from another, and thereafter fed to suitable mechanism for splitting or otherwise operating upon the sheets.

The present invention contemplates the use of a rigid frame carrying a bed plate, upon which bed plate the rolling or splitting mechanism is mounted. As an extension of said bed plate a hopper for a stack of sheet plates is provided, and, in the present instance, vacuum means are fitted upon the bed plate to separate the lowermost of the stack from the remainder of the stack, and thereafter feed this sheet into the rolls.

The invention is illustrated, by way of example, in the accompanying drawings in which:—

Figure 1 is a view in plan showing the completely assembled machine, its splitting rolls and also the feed mechanism for the sheets.

Fig. 2 is a vertical section through the vacuum feed mechanism and further disclosing the sheet feed in operation therewith.

Fig. 3 is a view in end elevation illustrating the manner in which the stack of sheets is supported and the vacuum means operating to draw the lowermost sheet from the stack.

Referring more particularly to the drawing 10 indicates a frame. This frame is fitted with a bed plate 11, upon which the mechanism with which the present invention is concerned is mounted. Secured to the top of the bed plate are standards 12, adjustable toward and away from each other and forming the ends of a sheet plate hopper. The sheets are held in the stack, and are indicated generally at 13. Extending longitudinally in a frame and above the bed plates is an angle bar 14, at the front and rear sides, upon each of which is carried a plurality of vertically adjustable bars 15 spaced apart and supported adjustably thereupon by means of vertical set screws 16. These set screws are rotatable through opening in the upward horizontally extending portion of the angle bar 14 and are supported from flanges on top of the bars 15.

In order to hold the bars 15 in their adjusted position set screws 18 are provided and passed through the slots in the vertically extending legs of the angle bars 14, and thereafter engage the lower end of each bar 15. The bars 15 are provided to hold the stack of sheets in the pile and operate in conjunction with the standard 12 for this purpose. The lower ends of the bars 15 do not extend entirely beneath the stack of sheets, but terminate above the lower edge thereof so that the lowermost sheet in the stack may be readily moved therefrom when desired. This end of the pile of sheets is supported upon a plurality of idlers 20, each of which is journaled in a holder 21 attached securely to the bed plate and with which the gage bars 15 coöperate to permit a single sheet to pass from the hopper formed by the standard 12 and the gage bars and to an operating mechanism. Formed upon the bed plate 11 are grooves 22. These grooves extend parallel to each other and laterally of the plate. Mounted in these grooves 22 are reciprocating bars 23, each of which is provided with a plurality of spring pressed dogs 24. These dogs are provided to engage and advance the sheets after they have left the stack. A transversely extending frame member 25 rigidly connects the two bars 23 and forms a structure carrying members for separating the stack from the lowermost plate. Mounted upon the frame 25 is a series of three tapered supporting ledges, 28, 29 and 30, respectively. The formation of these ledges is particularly shown in Fig. 2, where it will be seen that they each have upper and lower flattened portions 31 and 32, which are connected by an inclined portion 33—the lower flattened portion supporting the stack of sheets normally and the inclined portion moving beneath the stack of sheets during the operation of the machine to raise it as particularly shown in Fig. 3. In this figure it will be seen that the central ledge 29

is a vertical member rigidly secured to the frame 25 and the ledges 28 and 30 are angle shaped and are not positioned entirely beneath the ends of the sheets but substantially midway between the center of the edge and the end. The standards 12 are shown in the Fig. 1 of the drawings as being disposed directly adjacent to corners of the stack of sheets, and thus will support these corners when they are drawn down by suitable segregating mechanism. As particularly shown in Fig. 3, the standards are formed with extension fingers at the outer edges which will facilitate feeding a plurality of sheets to the stack. Mounted directly in the rear of the stack of sheets and near the corner edges thereof are a pair of angle brackets 34. These angle brackets 34 are provided with bearing 35 which extends horizontally and in a direction parallel to the movement of the sheets as they are sent from the stack. The bearing portion 35 of each of the angle members is fitted with a pin 36. These pins are provided as a swinging mounting for an angle bracket 37. The angle brackets depend from the pin and are free to rotate thereon while horizontal legs extend forwardly to the stack of sheets as particularly shown in Fig. 2. Mounted beneath the rear edge of the sheets in the angle brackets is a suction cup 38. Cup 38 is here shown as having a flexible bell-shaped portion 39 and being further mounted upon a rigid tubular core 40 carried in the angle member 37. Extending through the core 40 and communicating with the bell-shaped portion 39 is an air duct 41. This duct is in communication with a flexible tube 42, leading to a pump 43. The pump 43 is fitted with a suitable piston adapted to be reciprocated by piston rod 44. As shown in Fig. 2, the rod 44 is connected to a crank arm 45, fixed upon an operating shaft 46. As shown in Fig. 3, the supply tube 42 extends outwardly in opposite direction from a connection key 48. This key is fixed to the cylinder 43. In order that the cups of the vacuum members may be automatically adapted to the under surface of the lowermost sheet in the stack, a coil spring 49 is mounted upon each of the bearings 35, and exerts a rotating action upon the angle members 37 to hold them in a normal position for the proper register with the under face of the sheet. Angle members 51 are formed with overhanging lips 52, which pass over the top of the sheet separated from the stack and hold it while it is being sent forward.

In operation of the present invention a stack of sheet metal plates is mounted between the standard 12 and the adjustable end bars 15. When in this position the frame 25 is retracted, that is to say, the stack of sheets is supported upon the ledge 32 of each of the members 28, 29 and 30. As the machine operates the leg members 28, 29 and 30 are moved inwardly with the frame 25 and in the direction of the arrow, as indicated in Fig. 1. This inward movement will, of course, draw the leg members beneath the stack of plates and will force the stack upwardly along the inclined surfaces 33 of each member. Prior to this operation the lowermost sheet in the stack has been engaged by the suction cup 38 and held down in the position shown in Fig. 3. The members 28, 29 and 30 will force their way beneath the stack and beneath the lowermost member and thus drawing the central portion of the lower sheet upwardly and bowing it as shown in Fig. 2. This action and the holding movement of the vacuum members at the corners of this lower flexible sheet will cause the sheet to be warped, that is, the corners near the edge of the machine will both be drawn downwardly. After this has been done the further movement of the frame 25 will cause the members 51 to move forwardly and the fingers 52 thereof to overhang the edge of the plate held in position by the vacuum. When this position has been reached by the members 51, the vacuum action will be discontinued by the timing and reciprocal movement of the piston of the pump 43, and the lower plate will thus be sent forwardly to a pair of rollers 53 and 54, carried in suitable standards 55, at the opposite side of the machine. It will be understood, however, that other machines might be fed by such an apparatus, and the rollers indicated in the drawings are not an essential part of this invention.

It must be seen that the device here disclosed eliminates the possibility of passing two sheets from the machine as is often the case when mechanical separating and feeding means are used, and also has a simple and direct operation which eliminates the labor necessary when the manual operation of the feed is used. It will be further noted that the present invention, while simple in construction, will positively segregate the lowermost sheet from the stack and deliver it to any desired machine in a horizontal feed operation.

While I have shown the preferred form of my invention now known to me, it will be understood that various changes in the combination, construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention claimed.

Having thus described my invention what I claim as new and for which I desire to secure Letters Patent is:—

1. In a sheet feeding mechanism a hopper, a pair of reciprocating bars below said hopper, a frame carried thereupon adapted to move beneath a stack of sheet plates posi-

tioned within the hopper, means positioned upon the frame for elevating the stack of plates as the frame is moved, and pneumatic means for separating the lowermost sheet from the stack of sheets as the body of the stack is elevated.

2. In a sheet feeding mechanism a hopper, a pair of reciprocating bars below said hopper, a frame carried thereupon adapted to move beneath a stack of sheet plates positioned within the hopper, means positioned upon the frame for elevating the stack of plates as the frame is moved, pneumatic means for separating the lowermost sheet from the stack of sheets as the body of the stack is elevated, and means carried upon said reciprocating frame for engaging the lowermost sheet as separated by the pneumatic means for feeding the sheet in a horizontal plane.

3. In a sheet feeding machine a hopper adapted to receive a stack of sheet metal plates, a reciprocating frame passing transversely beneath said stack of plates, means carried upon said frame for elevating the stack as the frame reciprocates, means mounted upon the machine for separating the lowermost sheet from the stack while the main body of the stack is being elevated, and means carried upon the reciprocating frame for engaging the edge of the separated sheet and for feeding it from beneath the stack and clear of the machine.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FREDRICK F. CLARK.

Witnesses:
W. W. HEALEY,
J. H. HERRING.