June 12, 1962 E. GRIMM 3,038,647

SLIDE FEED

Filed Sept. 3, 1959 3 Sheets-Sheet 1

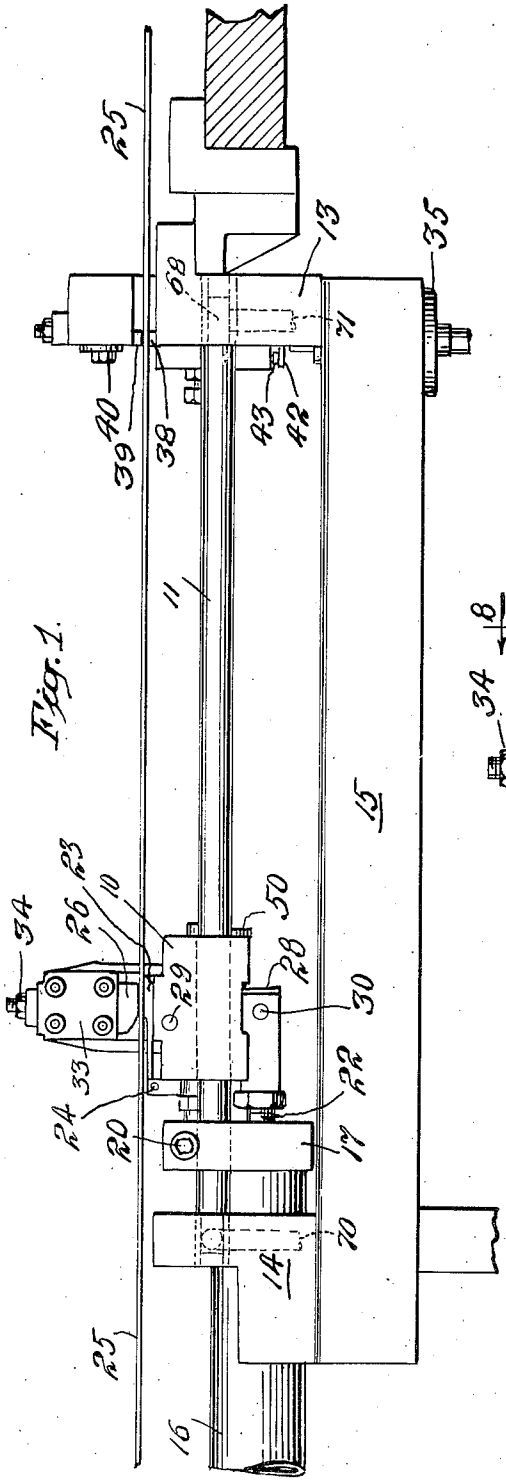


Fig. 1.

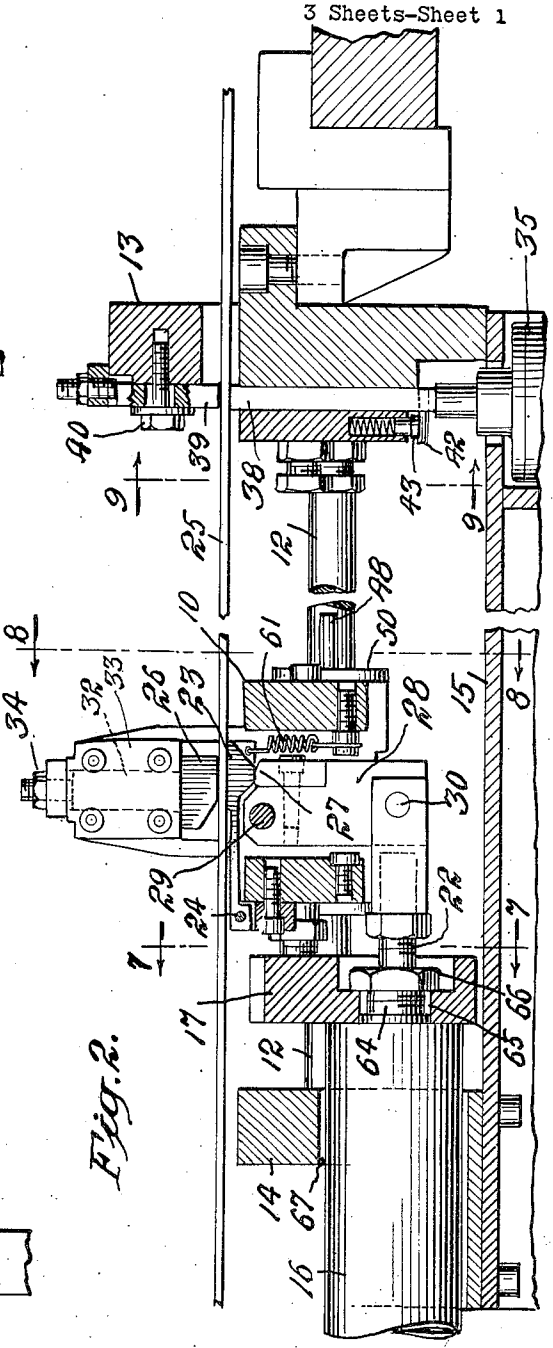


Fig. 2.

INVENTOR.
ERIC GRIMM

BY

ATTORNEY

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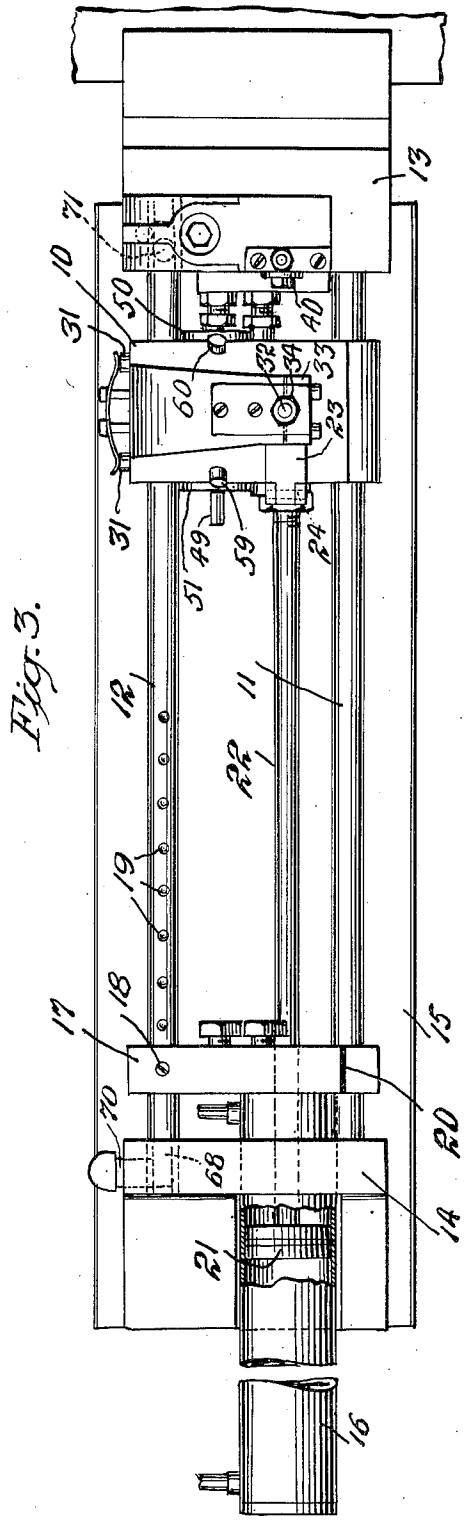


Fig. 3.

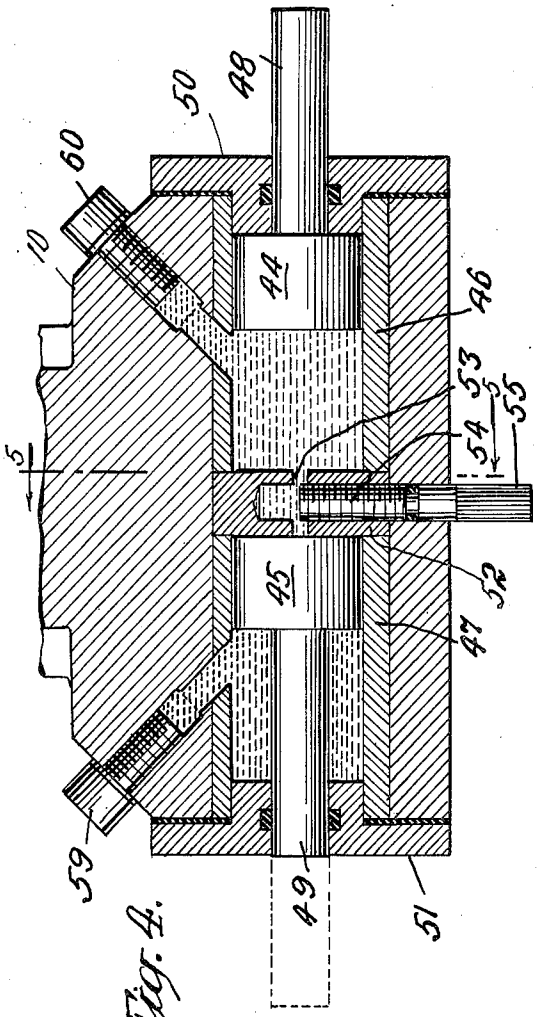


Fig. 4.

INVENTOR.
ERIC GRIMM

BY Philip S. McLean.
ATTORNEY

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Fig. 7.

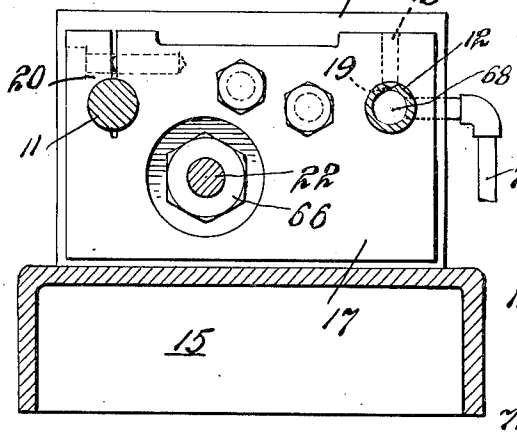


Fig. 9.

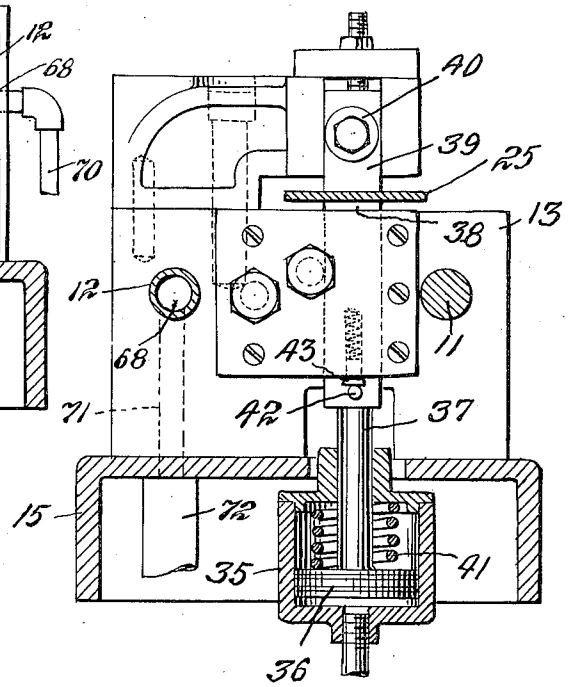


Fig. 8.

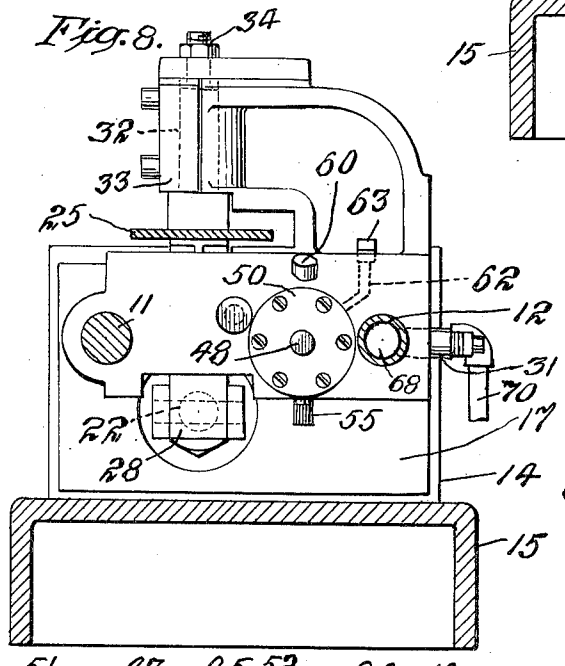


Fig. 5.

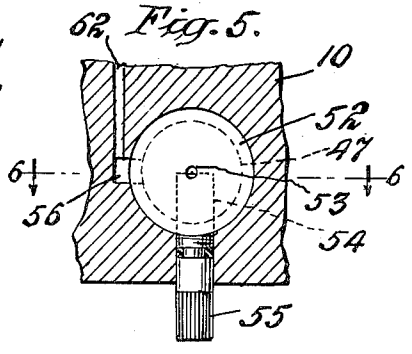
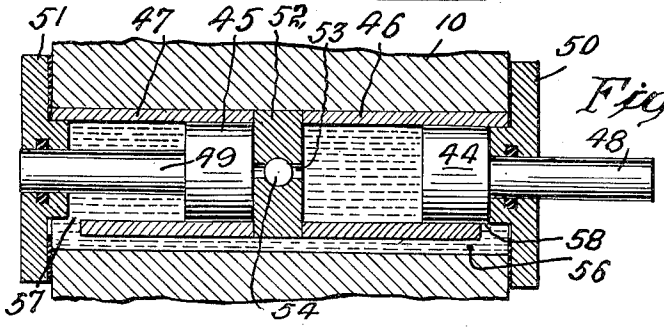


Fig. 6.



INVENTOR.
ERIC GRIMM

BY

Philip S. McLean
ATTORNEY

United States Patent Office 3,038,647 Patented June 12, 1962

3,038,647

SLIDE FEED

Eric Grimm, East Orange, N.J., assignor to U.S. Tool Company, Inc., Ampere, N.J., a corporation of New Jersey

Filed Sept. 3, 1959, Ser. No. 837,870
1 Claim. (Cl. 226—159)

The invention herein disclosed relates to slide feeds and more particularly to devices of this sort operated by compressed air.

Objects of the invention are to accomplish accurate, reliable, high speed smooth operation in a simple, inexpensive form of construction made up of few, readily assembled parts that can be produced at low cost.

Further special objects of the invention are to provide a slide feed having these characteristics which can be readily adjusted to handle different materials or to meet different requirements and which generally will be entirely practical and efficient.

Other desirable objects and the novel features through which the purposes of the invention are attained are set forth and will appear in the course of the following specification.

The drawings accompanying and forming part of the specification are illustrative of a present commercial embodiment of the invention but it will be appreciated that structure may be modified and changed, all within the true intent and scope of the invention as hereinafter defined and claimed.

FIG. 1 in the drawings is a broken side elevation of one of the slide feeds showing the feed block in retracted position.

FIG. 2 is an enlarged broken sectional view of the same parts, the section being taken to show the gripper closed on the stock and the stock check in open or release position.

FIG. 3 is a broken part sectional plan view showing the feed block advanced against the front stop.

FIG. 4 is an enlarged broken sectional view on substantially the plane of line 4—4 of FIG. 3 showing the two hydraulic pistons for cushioning stoppage of the feed block movement in opposite directions.

FIG. 5 is a broken cross sectional detail on substantially the plane of line 5—5 of FIG. 4 showing the by-pass for conducting the cushioning fluid to the opposite sides of the independently operating stop pistons and the valve for adjusting the orifice passage between the pistons.

FIG. 6 is a broken longitudinal sectional view through the cylinders of the stop mechanism on substantially the plane of line 6—6 of FIG. 5, at a right angle to the plane of FIG. 4.

FIG. 7 is a cross sectional view on substantially the plane of line 7—7 of FIG. 2 showing particularly the bracket for supporting the air cylinder adjustably mounted on the guide rods.

FIG. 8 is a cross sectional view on substantially the plane of line 8—8 of FIG. 2 showing particularly the feed block slidably mounted on the guide rods.

FIG. 9 is a sectional view on substantially the plane of line 9—9 of FIG. 2 and showing particularly the stock check at the front end of the unit.

In the embodiment illustrated the feed block 10 is mounted to ride on guide rods 11, 12 carried by front and back brackets 13, 14 on opposite ends of an inverted channel hollow base 15. The air cylinder 16 is carried by a stop bracket 17 adjustably secured on the guide rods by a set screw 18 to engage seats 19 on one guide rod (12) and a split clamp 20 engaging the other guide rod.

Piston 21 operating in the cylinder has a rod 22 connected to actuate the gripper and reciprocate the feed block.

The gripper is shown in FIG. 2 as comprising a clamp lever 23 pivoted on the feed block at 24 beneath the wire or stock line indicated at 25 in position to clamp the stock against an upper abutment or jaw 26 and arranged to be lifted and lowered by a shoulder 27 on lever 28 pivoted at its upper end on the block at 29 and pivotally connected at its lower end at 30 with the free end of the piston rod 22.

The feed block may be suitably braked to assure proper stock gripping and releasing action of the gripper by spring pressed brake plugs 31, FIG. 3, on the block engaging one of the guide rods (12).

The upper stationary jaw 26 of the gripper is shown in FIGS. 1, 2 and 8 in the form of a plate having a stem portion 32 adjustably held on the block by clamp plate 33 and adapted to be shifted for fine clamping adjustments by nut 34 in screw engagement with the upper end of the stem.

The lever 23 forming the movable, lower jaw of the gripper is shown as having an extended gripping face opposite the upper jaw 26, FIGS. 2 and 8, so as to grip with sufficient pressure to avoid slippage, without marring or injuring the stock.

A stock check is provided in the present illustration in the form of a small air cylinder 35 within the hollow base, at the front end of the machine, containing a piston 36, FIG. 9, having an upwardly projecting piston rod 37 carrying a clamp plate 38 beneath the stock line, opposed to a companion upper clamp plate 39, the latter adjustably mounted at 40 on the stationary front bracket 13.

The piston 36, as shown in FIG. 9, lowers to release holding grip on the stock so releasing action will normally be automatically effected by release of pressure from the cylinder but to assure quick immediate release the piston may be counterbalanced by a spring 41.

The upstroke or clamping movement of the stock check slide 38 is shown in FIGS. 2 and 9 as limited and cushioned by an outstanding lug 42 in engagement with a spring pressed stop button 43.

To cushion the stopping of the feed block at opposite ends of its movement the mechanism shown in FIGS. 4, 5 and 6 is provided in the form of small pistons 44, 45 operating in cylinders 46, 47 in the forward and back ends of the feed block and having stems 48, 49 to project alternatively through the heads 50, 51 closing the open ends of these cylinders.

A wall or partition 52 separates the inner ends of the two cylinders and this wall has an orifice 53 through it establishing communication between the inner ends of the cylinders, rendered adjustable by a valve screw 54 intercepting the orifice and adjustable by an exposed handle stem 55.

FIGS. 5 and 6 show how the outer end portions of the cylinders, at the outer sides of the pistons operating therein are connected by a by-pass channel 56 having ports 57, 58 opening into the outer ends of the cylinders.

FIG. 4 shows how the cylinders are provided with individual filling plugs 59, 60 and further shows how these cylinders are filled with hydraulic fluid, with one piston, the one at the left in this view, all the way in, and the other piston, the one at the right, all the way out, so that in circulation of the fluid in the closed circuit shown the movement of one piston in one direction will effect movement of the other piston in the opposite direction, thus to effect projection of one piston stem when the other piston stem is retracted.

The flow of circulating fluid in this closed track is controlled by the orifice valve 54 and hence the rate at which the feed block is cushioned and stopped can be determined by simple hand adjustments of this valve. If con-

sidered desirable, this valve may be secured in adjusted relation by lock nut or other means.

The pivoted lever forming the lower jaw of the stock gripper is shown in FIG. 2 as held by spring **61** in engagement with the rocking shoulder **27** which closes the gripper.

While ordinarily the stop cylinders and pistons may be in alignment as shown in FIGS. 4 and 6, the construction shown, with separate cylinders and pistons at opposite ends of the block permits location of these cushioning and stopping devices in off-set or out-of-line arrangement at the opposite ends of the block, as may be desirable or necessary to meet special requirements.

To avoid possibility of trapping air in the closed circulating system of the hydraulic cushioning devices, a special bleed port **62**, FIGS. 5, 6 and 8, may be extended from the bypass connection **56**, up through the top of the block, normally closed by screw plug **63**, which may be removed and this port serve as an overflow when the cylinders are being filled with oil.

To provide unlimited adjustment for the air cylinder, the bracket **17**, mounting this cylinder may be secured on the guide rods by split clamps such as shown at **20**, FIG. 7, on both rods, instead of having the set screws as shown at **18**, on one of the rods.

The air cylinder is shown as removably mounted on the stop bracket **17**, by having a screw threaded neck portion **64**, FIG. 2, extended through an opening **65**, in the bracket and there secured by a nut **66**.

The back support **14**, is shown as having an opening **67**, for passage of the air cylinder therethrough enabling this support to serve as a protective guard or partial enclosure about the outwardly extended portion of the cylinder.

In handling heavy stock, greater braking pressure may be required and this, particularly with rapid long stroke feed has a tendency to heat up the guide rod, **12** in this case, on which the braking pressure is applied.

To overcome or reduce this heating effect, the invention provides special cooling of the braked guide rod by the expanding air exhausted from the air feed cylinder.

For such purposes, the guide rod **12**, or the other or both guide rods, depending on where braking is applied, is or are made hollow as shown at **68**, FIGS. 7 and 9, and an exhaust connection **70**, taken from the exhaust valve of the air cylinder is run through the block **14**, which supports the guide rods into the hollow rod and at the

opposite end a passage **71**, is extended down through the supporting block **13**, at that end, terminating in this instance, in a muffler **72**.

The exhaust air released from the air cylinder, expanding in passage through the hollow guide rod keeps this rod relatively cool and at a temperature comparable with the other guide rod in spite of the braking pressure applied thereto, thus to a practical extent overcoming any unequal expansion tendencies of the two rods.

While generally considered desirable to have an adjustment screw **54**, for determining pressure flow between the two check cylinders **46, 47**, it is possible to have a fixed orifice passage between these cylinders determined by an insert orifice bushing or by other accurate orifice forming means.

While the lower gripper jaw is shown as a lever **23**, pivoted at the back end at **24**, it is contemplated that this relation may be reversed and this lever be pivotally supported at its front end.

It will be realized that other changes may be made all within the true intent and scope of the invention as herein defined and claimed. Thus, for example, it is contemplated that air bumpers may be used in place of hydraulic bumpers illustrated.

What is claimed is:

Slide feed comprising the combination of a reciprocating slide block carrying a stock gripper, a tubular guide rod on which said slide block reciprocates, brake means on said slide block acting on said guide rod, an air cylinder and piston connected to reciprocate said slide block and means for conducting exhaust air from said air cylinder through said tubular guide rod for effecting cooling of said rod as heated by said brake means.

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