Aug. 18, 1959 J. SACK 2,900,095

HANDLING DEVICE FOR FEEDING TOOLS TO A METAL WORKING MACHINE

Original Filed Oct. 25, 1957 2 Sheets-Sheet 1

FIG. 2.

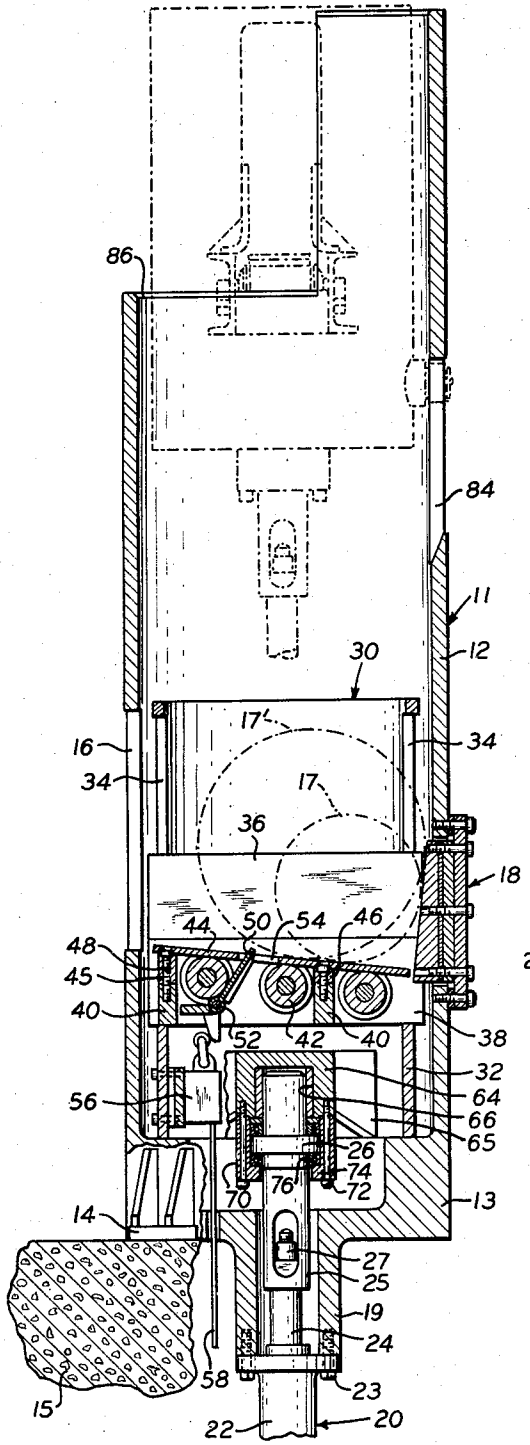


FIG. 4.

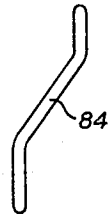
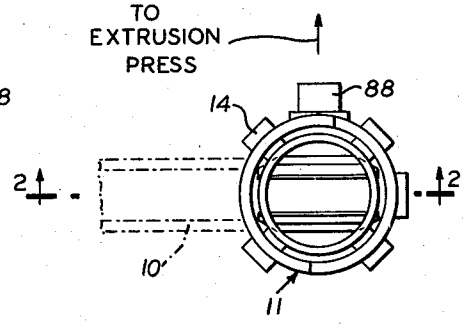


FIG. 1.



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FIG. 5.

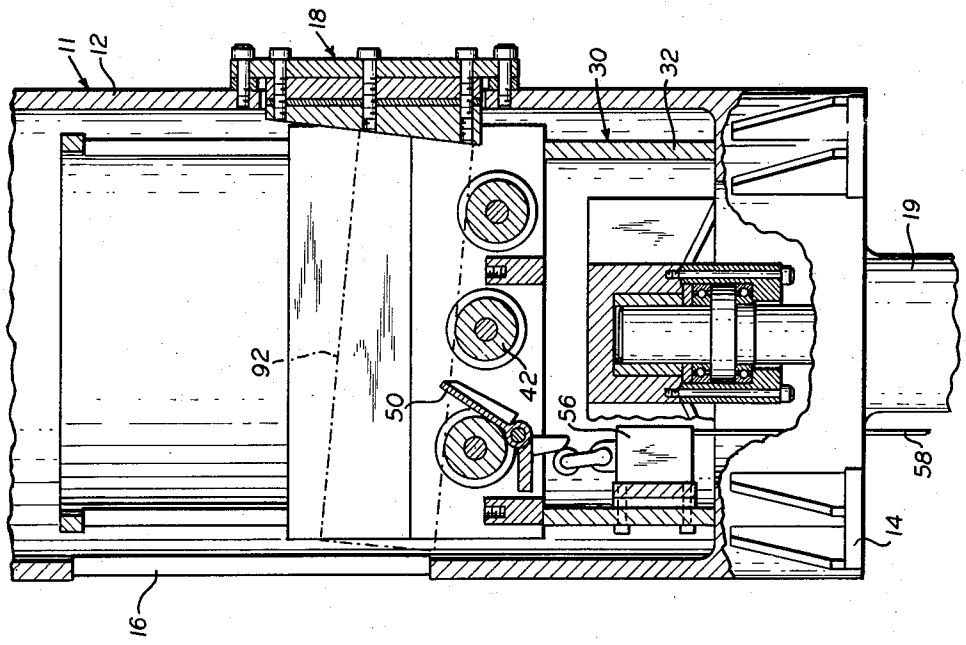
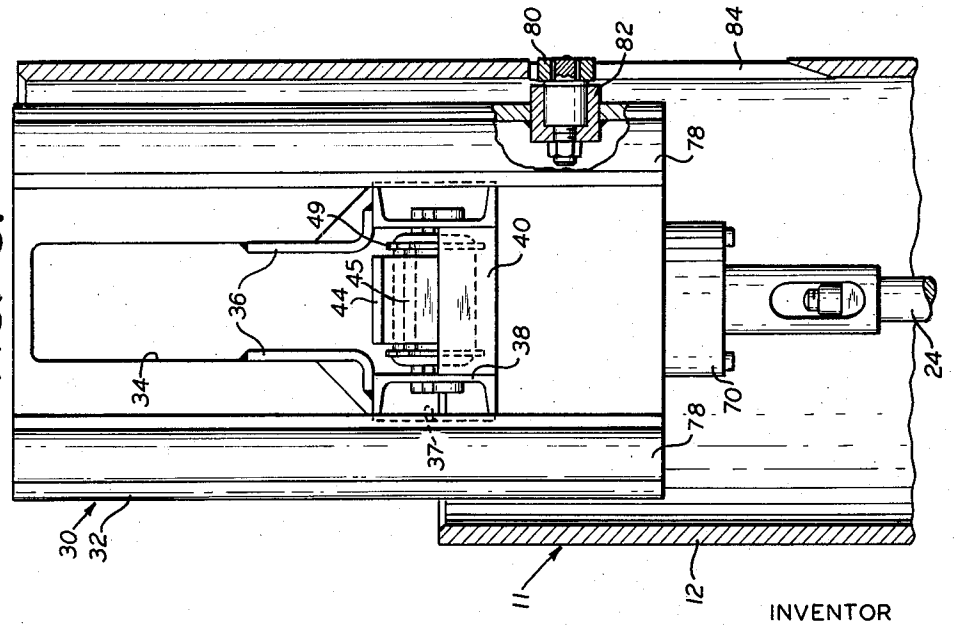


FIG. 3.



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HANDLING DEVICE FOR FEEDING TOOLS TO A METAL WORKING MACHINE

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Original application October 25, 1957, Serial No. 692,443. Divided and this application September 17, 1958, Serial No. 761,650

3 Claims. (Cl. 214—95)

My invention relates to a handling device for feeding tools to a horizontal metal working machine, and more particularly a convertible device for selectively handling disk-shaped or oblong tools.

This application is a division of my copending application Ser. No. 692,443, filed October 25, 1957, and entitled "Loading Apparatus for Horizontal Metal Working Machines."

The device according to this invention is suitable in particular for feeding dummy blocks to horizontal metal extrusion presses in which a preheated billet is inserted into the container of the pressed and then extruded through a die by means of a plunger or pressing stem. A dummy block is arranged between stem and heated billet to protect the stem and prevent the billet material from adhering thereto.

Normally, the billets are of circular cross section and, after heating, one of the billets is deposited on a loader connected to the press. The corresponding round, disk-shaped dummy block usually rolls down a chute which is curved so that, as required, it arrives at the loading station with its axis parallel to the axis of the press. The dummy block may then be deposited on the billet loader and may be charged into the press together with the billet.

On the other hand, if relatively wide extrusions of oblong cross section are to be produced, it is of great advantage to employ billets of corresponding oblong cross section. As the dummy blocks likewise will be of oblong shape, special means will be required if it is desired to feed such blocks, as well as round blocks, mechanically to the loading station so that they may be charged into the press together with the billet. Normally, it will also be necessary to move the blocks vertically to the level of the loading mechanism of the press.

It is an object of the invention to provide a simple convertible handling device for selectively feed disk-shaped or oblong tools such as dummy blocks to a horizontal metal working machine.

It is also an object of the invention to provide a convertible handling device of the above type which will move the tools vertically to a predetermined position and simultaneously turn the same substantially through a right angle.

Various other objects, features and advantages of the invention will become apparent as the description proceeds.

In the drawings which illustrate an embodiment of the invention by way of example,

Fig. 1 is a plan view of a device according to the invention;

Fig. 2 is an enlarged sectional view taken generally along line 2—2 of Fig. 1 and showing the device adjusted for the handling of round dummies with the parts illustrated in full lines in the initial position and in chain lines in the discharge position;

Fig. 3 is a fragmentary view similar to Fig. 2 but drawn on a still larger scale, partly in section, and shows the upper portion of the feeding device with the parts illustrated in full lines in the discharge position;

Fig. 4 is a diagram illustrating a detail on a reduced scale;

Fig. 5 shows the lower portion of Fig. 2 on a larger scale with the parts adjusted for feeding oblong dummy blocks.

Referring to the drawings, an inclined chute **10** indicated in chain lines in Fig. 1 extends generally parallel to the axis of a horizontal metal extrusion press (not shown) to return used, cleaned dummy blocks from the discharge end of the press to the loading region. In conventional arrangements which deal with round dummies only ,the chute is curved near the billet loader so that the feeding direction is changed by 90 degrees and the round dummy blocks roll down towards the axis of the press and are deposited on a loader, e.g., a billet loader of the type shown in my aforesaid copending application Ser. No. 692,443. Such arc-shaped path, however, would not be suitable for oblong billets since the latter would jam in the curved section of the chute. To overcome these difficulties, my device provides for turning the dummy blocks through an angle of 90 degrees while their forward motion is interrupted. At the same time, the blocks are moved vertically to the level of the billet loader.

Referring in particular to Figs. 2 to 4 a housing generally indicated at 11 comprises a cylindrical or tubular portion **12**, a bottom **13**, and brackets **14** for supporting the housing on the foundation **15**. The housing has an opening or window **16** registering with the chute **10** (Fig. 1) so that a dummy block such as the round block shown in chain lines at **17** in Fig. 2 may enter the housing. The largest round block which may be handled in the device is indicated at **17'** in Fig. 2. Opposite to the opening **16**, the housing is provided with a wear plate assembly **18** for the stopping of dummy blocks in the housing. The bottom **13** has a tubular extension **19** and carries a double-acting cylinder and piston unit generally indicated at **20**. Cylinder **22** of the unit is secured to the extension **19** by screws **23** while piston rod **24** extends upwardly into the tubular extension **19**. A connector **25** having a collar **26** intermediate its ends is attached to the piston rod **24** at **27**.

A welded table structure generally indicated at **30** is movable in housing **11** and comprises a pipe section **32** having a pair of opposite laterall openings or windows **34** which receive guide plates **36** and are of increased width at their lower ends **37** (Fig. 3) where they accommodate channel sections **38**, the plates **36** and channels **38** being joined to the walls of the windows so as to bridge the space therebetween. The channel sections **38** are connected by two cross bars **40** (Fig. 2) and carry a set of rollers **42** arranged in a sloping manner. A cover plate **44** has one relatively high rib **45** and one lower rib **46** and is releasably fastened to the cross bars **40** by means of screws **48** to form an inclined path above the rollers **42**. It should be noted that the cover plate **44** and its ribs do not extend through the entire width of the space between channel sections **38**, the cover plate being interposed between lateral shoulders **49** (Fig. 3) of rollers **42** (Fig. 2). A bell crank lever **50** is pivotally mounted at **52** between channels **38** so that one of its arms extends upwardly between rollers **42** into an opening **54** of cover plate **44** while the other arm of lever **50** cooperates with a limit switch **56** which is secured to the pipe section **32** and has a flexible electric cord **58** attached thereto.

To connect table **30** to the actuating mechanism, the

pipe section **32** has a bottom lug **64** joined thereto by means of ribs **65**, and the bottom lug has a bushed bore **66** to accommodate the upper end of the connector **25**. A sleeve **70** is secured to the bottom lug **64** by means of screws **72** and has an internal shoulder **74** facing the lower side of collar **26** of the connector **25**. Antifriction bearings **76** are interposed between lug **64** and collar **26**, and between collar **26** and shoulder **74**, in a manner such that the table **30** is freely rotatable relative to the piston rod **24** but will be taken along by the piston rod in the vertical direction when the rod is lifted or lowered. To guide the table **30** in housing **11** during such movements, bars or strips **78** (Fig. 3) are joined to the outer wall of pipe section **32** and engage the inner wall of the tubular portion **12**.

A roller **80** is mounted on a boss **82** of pipe section **32** and engages a curved slot **84** in the tubular portion **12** so that table **30** is caused to turn through an angle of 90 degrees when the piston rod **24** performs a full stroke. The shape of slot **84** is shown diagrammatically in Fig. 4. It will be clear that the housing **11** and its slot **84** serve as fixed guide means for the table **30**. As indicated at **86** in Fig. 2, the tubular portion **12** is partly cut away at its upper end to allow for the discharge of dummy blocks onto a bracket **88** (Fig. 1) attached to the tubular portion.

When handling round material, the operation is normally started by causing one round dummy block to roll down the chute **10**. The dummy enters housing **11** and continues its movement on the inclined cover plate **44** between guide plates **36**. When passing over the cover plate **44**, the dummy depresses the upper arm of bell crank lever **50** and is thereafter stopped upon contact with the wear plate assembly **18**. Due to the movement of lever **50**, limit switch **56** is actuated and causes pressure fluid to enter cylinder **22** so that the piston rod **24** moves upwards and lifts the table **30**. Dummy **17** will move off the inclined face of wear plate assembly **18** and travel along the inner wall of tubular portion **12** during the upward movement. As roller **80** is guided in slot **84**, the table **30** while rising will at the same time make the desired turning motion so that the axis of dummy **17** will be turned through an angle of 90 degrees. The table will finally be stopped in the discharge position shown in chain lines in Fig. 2 and in full lines in Fig. 3. Since the wall of housing **11** is cut away at **86**, the dummy block is free to roll off table **30** onto bracket **88** which leads to the loading station of the press.

Referring to Fig. 5, the dummy block handling device is converted for feeding oblong or rectangular, flat dummies simply by removing the screws **48** and cover plate **44**. The oblong or rectangular dummies will thus be supported by the rollers **42**, which will facilitate the feeding operation. The chute **10** (Fig. 1) may likewise be provided with rollers or may be replaced entirely by a rollerway. Limit switch **56** is again used for the control of table **30**.

After the equipment has been adjusted for oblong material, one oblong, flat dummy indicated in chain lines at **92** in Fig. 5 is caused to enter housing **11** so that it is received on the table **30**. When passing over the rollers **42**, the dummy moves bell crank lever **50** so that limit switch **56** is actuated. Table **30** is then lifted and turned in the manner described in connection with the handling of round dummy blocks and the dummy will be discharged onto bracket **88** (Fig. 1) to be received at the loading station of the press.

Limit switch **56** controls the cylinder and piston unit **20** by conventional means such as solenoid operated valves, pilot operated valves, etc.

While certain preferred embodiments of the invention have been described, it will be understood that various modifications and changes may be made without departing from the scope and spirit of the invention as defined in the appended claims.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. A convertible handling device for selectively feeding disk-shaped and oblong, flat tools to a horizontal metal working machine comprising a stationary vertical, substantially cylindrical housing having an opening near its lower end for receiving one of said tools, a member movable within said housing between an initial position and an elevated position and having a passage therethrough, said passage being aligned with said opening in the initial position of said movable member to accommodate said one tool, an inclined rollerway in said passage, plate means releasably connected to the movable member in an inclined position within said passage so as to cover said rollerway when in place on said member, mechanism for lifting said member to its elevated position and for simultaneously turning it substantially through a right angle, and means in the region of the upper end of said housing for discharging said tool from said device upon completion of said lifting and turning movement.

2. A convertible handling device for selectively feeding disk-shaped and oblong, flat tools to a horizontal metal working machine comprising a stationary vertical, substantially cylindrical housing having an opening near its lower end for receiving one of said tools, a member movable within said housing between an initial position and an elevated position and having a passage therethrough, said passage being aligned with said opening in the initial position of said movable member to accommodate said one tool, an inclined rollerway in said passage, plate means releasably connected to the movable member in an inclined position within said passage so as to cover said rollerway when in place on said member, a cylinder and piston unit fixed to said housing for lifting said member to its elevated position, cooperating guide means on said housing and said member for turning said member substantially through a right angle during said lifting movement, control means engaged by said tool upon entry thereof in said passage to cause actuation of said unit, and means at the upper end of said housing for discharging said tool from said device upon completion of said lifting and turning movement.

3. A device as specified in claim 2, in which said plate means has an opening therein, said control means extending upwardly between individual rollers of said rollerway and through said opening when said plate means is connected to said movable member.

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