

United States Patent

[19]

Dietrick et al.

[11] 3,733,944

[45] May 22, 1973

[54] **SELECTIVE STRIPPER MECHANISM**

[75] Inventors: Eugene Lewis Dietrick, Norristown; Joseph Anthony Linkus, Levittown, both of Pa.

[73] Assignee: The Warner & Swasey Company, Cleveland, Ohio

[22] Filed: Oct. 12, 1971

[21] Appl. No.: 188,393

[52] U.S. Cl. 83/62, 83/71, 83/129, 83/130, 83/143

[51] Int. Cl. B26d 5/12, B26d 7/02, B26d 7/18

[58] Field of Search..... 83/130, 129, 140, 83/143, 552, 71, 62

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Primary Examiner—Andrew R. Juhasz

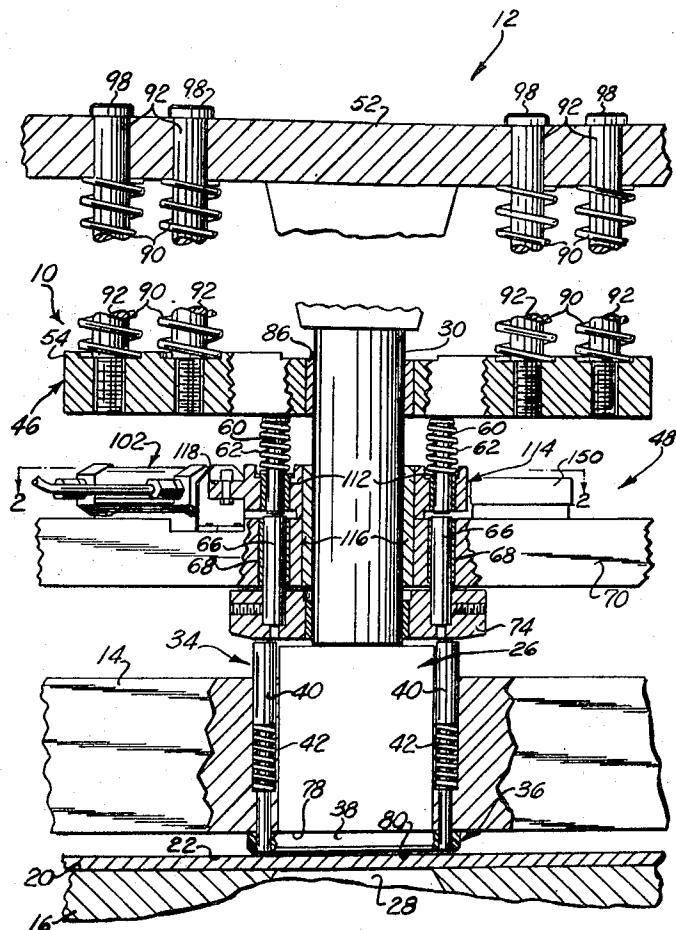
Assistant Examiner—Horace M. Culver

Attorney—J. Herman Yount, Jr. et al.

[57] **ABSTRACT**

An improved punch press includes a selectively operable stripper unit which presses a workpiece against a lower turret as a tool is retracted away from the workpiece by a ram. A transfer device transmits actuating forces to the stripper unit during an operating cycle of the punch press. To enable the stripper unit to be selectively operated, the transfer device is operable between an active condition in which it is effective to transmit actuating forces to the stripper unit and an inactive condition in which the transfer device is ineffective to transmit actuating forces. A control apparatus initiates a punching operation only after the transfer device has been operated to either the active or inactive condition.

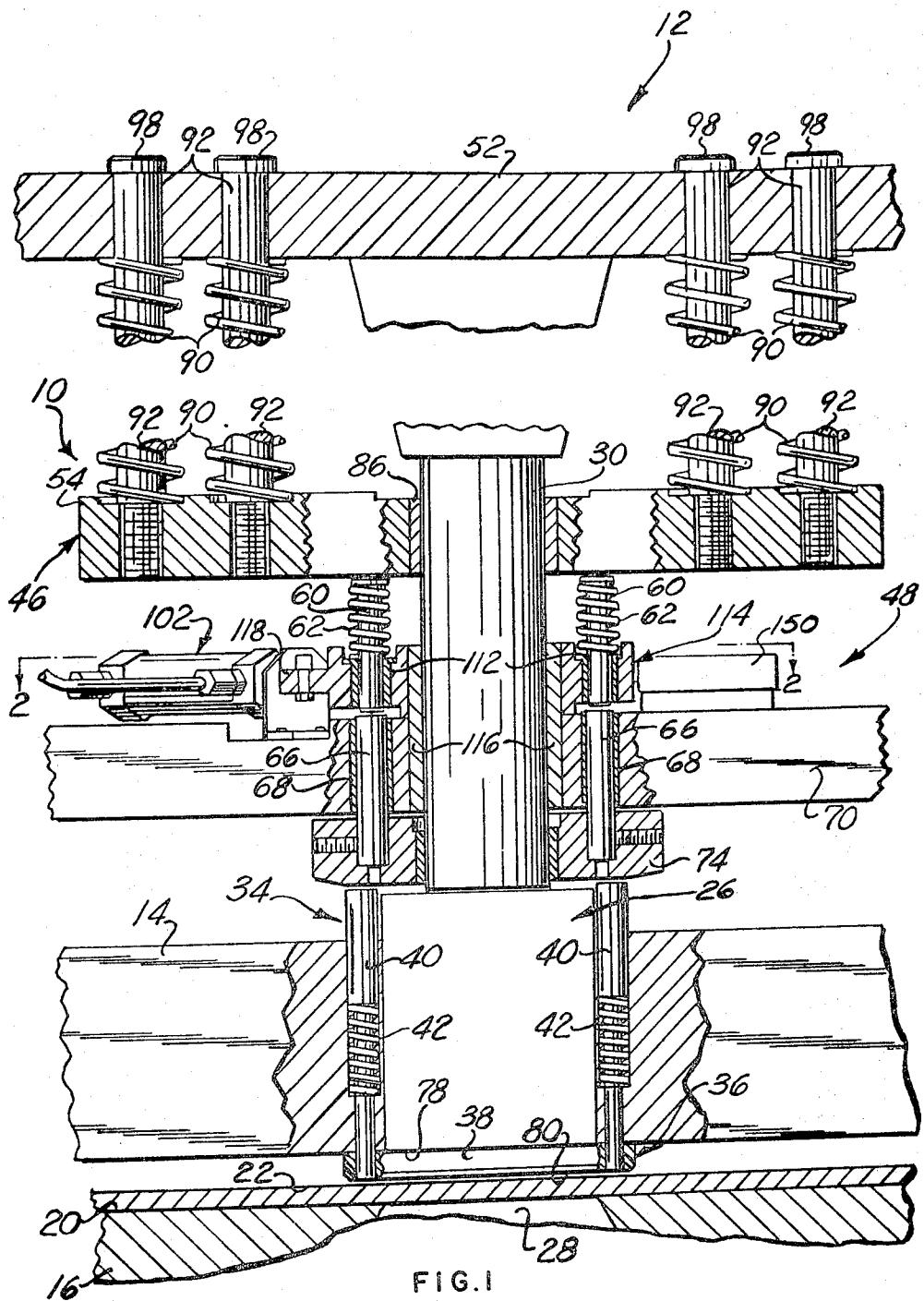
18 Claims, 4 Drawing Figures



PATENTED MAY 22 1973

3,733,944

SHEET 1 OF 2



PATENTED MAY 22 1973

3,733,944

SHEET 2 OF 2

FIG. 2

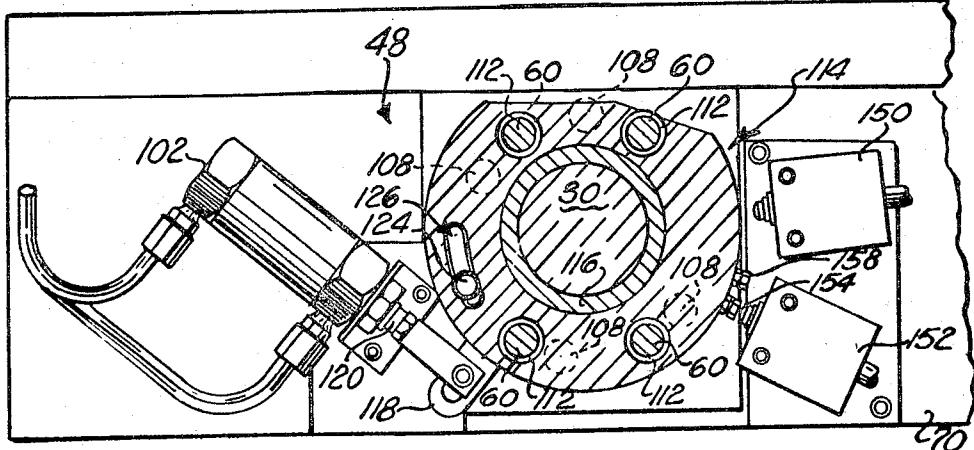


FIG. 3

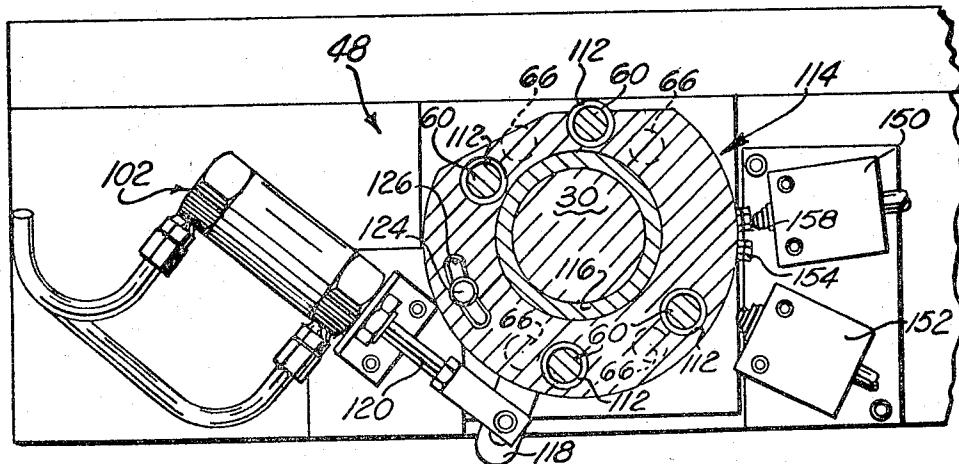
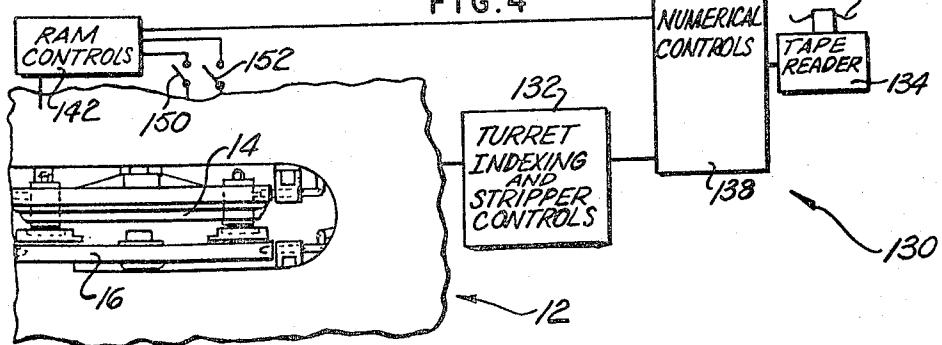


FIG. 4



SELECTIVE STRIPPER MECHANISM

The present invention relates to a new and improved stripper mechanism and more specifically to a stripper mechanism having a stripper unit which can be rendered effective or ineffective during operation of a machine tool.

A known punch press has a stripper mechanism for pressing a workpiece against a support surface as a punch or tool is retracted from the workpiece. This known stripper mechanism is operated on each cycle of the punch press. However, there are certain operating conditions where it is desirable to render the stripper mechanism ineffective.

Accordingly, it is an object of the present to provide a new and improved stripper mechanism which is selectively operable between an effective condition and an ineffective condition in accordance with the operating demands placed on a machine.

Another object of this invention is to provide a new and improved machine having a stripper unit which is selectively operable between an effective condition in which the stripper unit presses a workpiece against a support surface as a tool is retracted from the workpiece and an ineffective condition in which the stripper unit is ineffective to press the workpiece against the support surface as the tool is retracted.

Another object of this invention is to provide a new and improved turret punch press for performing work operations on a workpiece with a tool and including a selectively operable stripper unit which is mounted on an upper turret of the punch press and is actuatable to press a workpiece against a support surface on the lower turret as a tool is retracted from the workpiece by a ram, a transfer apparatus which may transmit actuating forces from the ram to the stripper unit during an operating cycle of the press, and wherein the transfer apparatus is operable between an active condition in which it is effective to transmit actuating forces from the ram to the stripper unit to render the stripper unit effective to press the workpiece against the lower turret as the tool is retracted and an inactive condition in which the transfer apparatus is ineffective to transmit actuating forces from the ram to the stripper unit to render the stripper unit ineffective to press the workpiece against the lower turret as the tool is retracted.

These and other objects and features of the present invention will become more apparent upon a consideration of the following description taken in connection with the accompanying drawings wherein:

FIG. 1 is a fragmentary illustration of a punch press having a stripper mechanism constructed in accordance with the present invention;

FIG. 2 is a fragmentary sectional view, taken along the line 2-2 of FIG. 1, illustrating the stripper mechanism in an active condition in which the stripper mechanism is effective to press a workpiece against a support surface as a tool is retracted from the workpiece;

FIG. 3 is a fragmentary plan view, generally similar to FIG. 2, illustrating the stripper mechanism in an inactive condition in which it is ineffective to press a workpiece against a support surface as a tool is retracted; and

FIG. 4 is a schematic illustration of control circuitry for the punch press of FIG. 1.

Although it is contemplated that an improved stripper mechanism 10 constructed in accordance with the present invention can be utilized in association with

many different types of machine tools, it is illustrated in FIG. 1 in association with a tape-controlled turret punch press 12. In accordance with conventional practice, the turret punch press 12 has selectively rotatably upper and lower turrets 14 and 16. The lower turret 16 defines a support surface 20 on which a workpiece 22 is disposed. During operation of the punch press 12, a hole is punched in the workpiece 22 by a punch or tool 26 which passes through the workpiece into a die or opening 28 in the lower turret 16. The punch 26 is pressed downwardly by a ram 30 which is activated in a suitable manner, such as by a known drive train which includes a crankshaft, clutch, and drive motor.

The stripper mechanism 10 includes a stripper-holddown unit 34 which engages an upper surface of the workpiece 22 to press the workpiece against the lower turret 16 as the punch 26 is retracted. A stripper plate or member 36 of the stripper unit 34 engages the workpiece 22 and has a central opening 38 through which the punch 26 passes. The cross-sectional configuration of the opening 38 is the same as the cross-sectional configuration of the punch 26.

To enable the stripper plate 36 to move into and out of engagement with the workpiece 22, the stripper plate is resiliently mounted on the upper turret 14 by a plurality of stripper pins 40 which are biased upwardly by springs 42. The springs 42 urge the stripper plate 36 upwardly against the lower surface of the turret 14. When the ram 30 is lowered or extended to force the punch 26 through the workpiece 22, the stripper plate 36 is pressed downwardly into engagement with the workpiece 22 under the influence of forces transferred from the ram 30 by a stripper actuator assembly 46 and a selectively operable transfer assembly 48 which is disposed between the actuator assembly 46 and the stripper-holddown unit 34. After the ram 30 has been retracted through a sufficient distance to move the punch 26 out of engagement with the workpiece 22, the biasing springs 42 are effective to return the stripper-holddown unit 34 to the retracted condition of FIG. 1.

Upon initiation of a punching operation, upper and lower spring plates 52 and 54 in the stripper actuator assembly 46 are moved downwardly with the ram 30 so that the lower spring plate 54 engages a plurality of transfer pins 60 in the transfer assembly 48. Continued downward movement of the ram 30 presses the transfer pins 60 against the influence of biasing springs 62 so that the transfer pins move axially into abutting engagement with guide pins 66 which are slidably disposed in bushings 68 in a punch press drive head 70. Still further downward movement of the ram 30 presses a drive plate or member 74, which is slidably mounted on the ram 30, against the stripper pins 40. Thus, a solid link or connection is formed between the lower spring plate 54 of the actuator assembly 46 and the stripper plate 36 by the transfer pins 60, guide pins 66, drive plate 74 and stripper pins 40.

Continued downward movement of the ram 30 results in the stripper plate 36 being pressed against the upper surface of the workpiece 22. It should be noted that the leading or lower end 78 of the punch 26 follows or lags behind the leading or lower surface 80 of the stripper plate 36. Therefore, the stripper plate 36 engages the workpiece 22 and presses it against the lower turret 16 before punch 26 engages the workpiece.

Once the stripper plate 36 has moved into pressure engagement with the workpiece 22, the stripper actuator assembly 46 is resiliently compressed so that relative movement occurs between the punch 26 and stripper plate 36. This relative movement enables the punch 26 to pass through the workpiece 22 into the opening 28 while the workpiece is pressed against the lower turret 16 by stripper plate 36.

To enable relative movement to occur between the punch 26 and stripper plate 36, the stripper actuator assembly 46 is compressed under the influence of forces transmitted between the stripper plate 36 and the lower spring plate 54 of actuator assembly by the stripper pins 40 and transfer device 48. Thus, the lower spring plate 54 is slidably mounted on the ram 30, by 15 a bushing 86. The upper spring plate 52 is fixedly connected with the ram 30 and is movable downwardly toward the lower spring plate 54 against the influence of biasing springs 90 disposed between the upper and lower spring plates on guide members or pins 92. It should be noted that the biasing springs 90 are somewhat stiffer than the stripper pin biasing springs 42 and transfer pin biasing springs 62 so that relative movement occurs between the spring plates 52 and 54 only after the transfer pins 60 and stripper pins 40 have been 20 moved axially relative to the lower turret 14 under the influence of forces transmitted from the ram 30 by the actuator assembly 46.

After a hole has been punched in the workpiece 22, the ram 30 is retracted. During initial retraction of the 30 ram 30, the workpiece 22 is pressed downwardly against the lower turret 16 to strip the workpiece from the punch 26 as it is withdrawn. Thus, as the ram 30 begins its upward stroke, the upper spring plate 52 moves upwardly away from the lower spring plate 54 with a relaxing of the springs 90. As the springs 90 are relaxed they urge the lower plate 54 downwardly with sufficient force to press the stripper plate 36 firmly against the workpiece 22. Therefore, the stripper biasing springs 42 and transfer biasing springs 62 remain compressed under the influence of forces transmitted to the stripper plate 36 by transfer pins 60, guide pins 66, drive plate 74 and stripper pins 40.

When the upper spring plate 52 moves into engagement with stops or heads 98 on the guide pins 92, the leading end 78 of the punch 26 has been retracted past the leading surface 80 of the stripper plate 36. Therefore, the workpiece 22 will have been completely stripped from the punch 26. Further upward movement of the ram 30 results in both the upper and lower spring plates 52 and 54 being moved upwardly together away from the lower turret 16. This releases the stripper plate 36 to move upwardly, under the influence of the springs 42, into engagement with the upper turret 14. Continued retraction of the ram 30 will result in the transfer pins 60 being moved axially upwardly under the influence of the springs 62 to the position shown in FIG. 1. Finally, the lower spring plate 54 is moved away from the upper ends of the transfer pins 60.

In accordance with a feature of the present invention, the stripper mechanism is selectively operable between an effective condition in which the stripper plate 36 presses the workpiece 22 against the lower turret 16 as the punch 26 is retracted and an ineffective condition in which the stripper plate does not press the workpiece against the lower turret as the punch is retracted. To effect operation of the stripper mechanism 10 between

the effective and ineffective conditions, the transfer device 48 is selectively operable between an active condition (FIG. 2) in which it is effective to transmit forces from the stripper actuator assembly 46 to the stripper-holddown unit 34 and an inactive condition (FIG. 3) in which the transfer device 48 is ineffective to transmit forces from the stripper actuator assembly 46 to the stripper-holddown unit 34. The transfer device 48 is operated between the active condition of FIG. 2 and the inactive condition of FIG. 3 by a piston and cylinder assembly 102.

When the transfer device 48 is in the active condition, the transfer pins 60 are in axial alignment with the guide pins 66 (as shown in FIG. 1) to transmit forces from the actuator assembly 46 to the guide pins 66 and stripper-holddown unit 34. The transfer device 48 is operated to the inactive condition by extending the piston cylinder 102 to move the transfer pins 60 transversely to the inactive position of FIG. 3 in which the transfer pins are axially offset relative to the guide pins 66. When the transfer device 48 is in the inactive condition of FIG. 3, downward movement of the lower spring plate 54 merely presses the transfer pins 60 axially downwardly into holes 108 formed in the press drive head 70. Therefore, this downward movement of the transfer pins 60 is ineffective to move the guide pins 66 and drive plate 74 downwardly to extend the stripper plate 36 against the influence of the springs 42.

To provide for movement of the transfer pins 60 between the active position of FIGS. 1 and 2 and the inactive position of FIG. 3, the transfer pins are slidably disposed in bushings 112 on a transfer plate 114 which is rotatably mounted on a ram bushing 116. The transfer plate 114 has an actuator arm 118 which is pivotally connected with a piston rod 120 of the piston and cylinder assembly 102. Thus when the piston and cylinder assembly 102 is operated from the retracted position of FIG. 2 to the extended position of FIG. 3, the transfer plate 114 is rotated about the longitudinal axis of the ram 30 to move the transfer pins 60 into axial alignment with the holes 108 in the drive head 70. When the transfer pins 60 are positioned in axial alignment with holes 108, the transfer device 48 is ineffective to transmit force from the stripper actuator assembly 46 to the stripper-holddown device 34 so that the stripper plate 36 remains in the retracted position (shown in FIG. 1) as the ram 30 and punch 26 are extended. Of course when the piston and cylinder assembly 102 is retracted, the transfer plate 114 is rotated from the position shown in FIG. 3 to the position shown in FIG. 2 to move the transfer pins 60 back into axial alignment with the guide pins 66. A screw or pin 124, which is fixedly connected with the drive head 70 and extends into an arcuate slot 126 in the transfer plate 114, guides movement of the transfer plate between the active position of FIG. 2 and the inactive position of FIG. 3.

Numerical controls 130 (FIG. 4) are provided to effect automatic operation of turret indexing and stripper controls 132. The numerical controls 130 include a known reader 134 for a tape 136. During operation of the punch press 12, the stripper mechanism 10 is operated between the effective and ineffective conditions in accordance with a predetermined program on the tape 136. Accordingly, signals are transmitted from the tape reader 134 to numerical controls 138 for the punch press 12 to indicate whether the stripper mechanism 10

is to be rendered effective or ineffective during a particular punching operation.

The numerical controls 138 activate ram controls 142 in accordance with these signals to activate the piston and cylinder assembly 102 when the stripper mechanism 10 is to be operated between the ineffective and effective condition between successive punching operations. To prevent operation of the punch press 12 when the transfer assembly 48 has been only partially actuated between the active position of FIG. 2 and inactive position of FIG. 3 and to provide an indication of the position of the transfer assembly, detector switches 150 and 152 are mounted on the press drive head 70 (see FIGS. 2 and 3) to sense the position of the transfer plate 114 relative to the press drive head. Thus when the transfer plate 114 is in the active position of FIG. 2, the normally open limit switch 152 is closed by a cam 154 mounted on the transfer plate 114. Similarly when the transfer plate 114, is in the inactive position of FIG. 3, the normally open limit switch 150 is closed by a cam 158 on the transfer plate 114. The detector switches 150 and 152 cooperate with the ram controls 142 (see FIG. 4) to provide an interlock which renders the punch press 12 incapable of initiating a punching operation until one of the detector switches, that is either detector switch 150 or 152, is closed. Of course, the particular limit switch 150 or 152 which must be closed will depend upon the program punched in the tape 136.

From the foregoing, it can be seen that the present invention provides a stripper mechanism 10 which is selectively operable between an active position and in which the stripper mechanism is effective to press a workpiece 22 against a support surface as the punch 26 is withdrawn from the workpiece and an inactive position in which the stripper mechanism is ineffective to press the workpiece against the support surface as the punch is retracted. To effect operation of the stripper mechanism 10 between the effective and ineffective conditions, a piston and cylinder assembly 102 is operable to rotate a transfer plate 114 to move transfer pins 60 between an active position in which they are in axial alignment with guide pins 66 to transmit force from the stripper actuator assembly 46 to the stripper-holddown device 34 and an inactive position in which the transfer pins are axially offset relative to the guide pins 66. In the inactive position, the transfer pins 60 are ineffective to transmit force from a stripper actuator assembly 46 to the stripper-holddown unit 34. Operation of the stripper mechanism 10 between the effective and ineffective conditions is advantageously controlled by numerical controls 130 for the punch press 12 in accordance with a predetermined program on a punch tape 136.

Although the transfer assembly 48 is illustrated herein in association with the guide pins 66 and drive plate 74, it is contemplated that the guide pins and drive plate could be omitted and the stripper pins 40 driven directly by the transfer pins 60. In addition, it should be understood that although the stripper mechanism 10 has been illustrated herein in association with a tape-controlled turret punch press 12, it should be understood that the stripper mechanism could be associated with other types of machines having different types of controls.

It should be understood that although only a single punch 26 and die 28 have been illustrated in the draw-

ings, it is contemplated that a plurality of punches will be mounted on the upper turret 14 in associated with a plurality of dies on the lower turret 16 in accordance with common practice. Thus, a plurality of stripper units 34 will be provided on the upper turret 14. Each of these stripper units will be associated with one punch 26 of the plurality of punches. Upon rotation of the upper and lower turrets 14 and 16, each punch and stripper unit will be moved in turn into cooperating relationship with the ram 30. Therefore, the same stripper actuator assembly 46 and transfer assembly 48 can be utilized to sequentially activate a plurality of stripper units 34. Of course, the transfer assembly 48 will be indexed to the inactive condition when the prepunched program on the tape 136 indicates that a particular stripper unit is to remain inactive during a punching operation.

Having described a specific preferred embodiment of the invention, the following is claimed:

1. A machine for performing work operations on a workpiece with a tool, said machine comprising a workpiece support surface, ram means for moving the tool through an operating cycle which includes moving the tool into engagement with the workpiece and retracting the tool from the workpiece, selectively operable stripper means associated with said ram means for pressing the workpiece against said support surface as the tool is retracted from the workpiece by said ram means, transfer means operable between an active condition in which said transfer means is effective to transmit actuating forces to said stripper means and an inactive condition in which said transfer means is ineffective to transmit actuating forces to said stripper means to render said stripper means ineffective to press the workpiece against said workpiece support surface as the tool is retracted, and actuator means for effecting operation of said transfer means between the active condition and the inactive condition.
2. A machine as set forth in claim 1 wherein said transfer means includes a plurality of actuator elements and mounting means for supporting said actuator elements for movement in a first direction to transfer actuating forces to said stripper means, said actuator means including means for moving said actuator elements in a second direction transverse to said first direction to effect operation of said transfer means between the active and inactive conditions.
3. A machine as set forth in claim 1 wherein said transfer means and stripper means include a plurality of sets of pins, said transfer means including means for moving one of said sets of pins from a first position in which said one set of pins is axially aligned with another set of pins to a second position in which said one set of pins is axially offset from said other set of pins upon operation of said transfer means from the active condition to the inactive condition.
4. A machine as set forth in claim 3 wherein said stripper means includes a stripper plate fixedly connected with one of said plurality of sets of pins.
5. A machine as set forth in claim 1 further including control means for controlling the operation of said machine, said control means including detector means for detecting when said transfer means is in the inactive condition and in the active condition, and interlock means for preventing movement of the tool by said ram means when said detector means detects that said

transfer means is in a condition other than the active condition or the inactive condition.

6. A machine as set forth in claim 1 further including ram control means for controlling operation of said ram means, main control means for activating said ram control means and interlock means for preventing activation of said ram control means by said main control means when said transfer means is in a condition other than the active or inactive conditions.

7. A turret punch press for performing work operations on a workpiece with a tool, said punch press comprising a base, an upper turret rotatably mounted on said base, a lower turret rotatably mounted on said base and at least partially defining a workpiece support surface, ram means for effecting relative movement between the tool and said upper and lower turrets to move the tool through an operating cycle which includes moving the tool into engagement with the workpiece and retracting the tool from the workpiece, selectively operable stripper means mounted on said upper turret and actuatable under the influences of forces transmitted to said stripper means from said ram means to press the workpiece against the workpiece support surface on said lower turret as the tool is retracted from the workpiece by said ram means, transfer means operatively connected with said stripper means and said ram means for transmitting actuating forces from said ram means to said stripper means during an operating cycle of said punch press, said transfer means being operable between an active condition in which said transfer means is effective to transmit actuating forces from said ram means to said stripper means to render said stripper means effective to press the workpiece against said workpiece support surface on said lower turret as the tool is retracted and an inactive condition in which said transfer means is ineffective to transmit actuating forces from said ram means to said stripper means to render said stripper means ineffective to press the workpiece against said workpiece support surface as the tool is retracted, actuator means for effecting operation of said transfer means between the active condition in which said stripper means is effective to press the workpiece against said workpiece support surface during retraction of the tool and the inactive condition in which said stripper means is ineffective to press the workpiece against said workpiece support surface during retraction of the tool, detector means for detecting when said transfer means has been operated to one of said conditions, and control means for initiating operation of said ram means to move the tool through an operating cycle only after detection by said detector means that said transfer means is in either said active or inactive condition.

8. A turret punch press as set forth in claim 7 wherein said stripper means includes a stripper element disposed between said upper and lower turrets and defining opening through which the tool passes to engage a workpiece, a plurality of stripper support members fixedly connected with said stripper element and movably mounted on said upper turret, and stripper springs operatively interconnecting said stripper support members and said lower turret to bias said stripper element upwardly against said upper turret, said transfer means including resilient drive means for transmitting force from said ram means and for enabling said ram means to move relative to said stripper means when the workpiece is pressed against said support surface with a pre-

determined force by said stripper means, a transfer member, and a plurality of transfer pins mounted on said transfer member, said transfer pins being effective to transmit force between said drive means and said stripper means when said transfer means is in the active condition, said transfer pins being movable axially relative to said stripper means by said drive means when said transfer means is in the inactive condition to thereby render said transfer pins ineffective to transmit forces between said drive means and said stripper means.

9. A turret punch press as set forth in claim 7 wherein said control means includes means for effecting operation of said transfer means between the active and inactive conditions in accordance with a predetermined program.

10. A turret punch press for performing work operations on a workpiece, said punch press comprising a base, an upper turret rotatably mounted on said base, a plurality of punches mounted on said upper turret, a lower turret rotatably mounted on said base and at least partially defining a workpiece support surface, drive means for rotating said turrets to move each of the punches in turn to a work station, ram means at the work station for effecting relative movement between one of the punches and said upper and lower turrets to move the one punch through an operating cycle which includes moving the one punch into engagement with the workpiece and retracting the one-punch from the workpiece, a plurality of selectively operable stripper means mounted on said upper turret, each of said stripper means being associated with one of said punches and being actuatable at the work station under the influences of forces transmitted to the stripper means at the work station from said ram means to press the workpiece against the workpiece support surface on said lower turret as the punch at the work station is retracted from the workpiece by said ram means, transfer means operatively connected with said ram means for transmitting actuating forces from said ram means to each of said stripper means in turn at the work station during operating cycles of said punch press, said transfer means being operable between an active condition in which said transfer means is effective to transmit actuating forces from said ram means to a stripper means at the work station to render the stripper support surface on said lower turret as the punch at the work station is retracted and an inactive condition in which said transfer means is ineffective to transmit actuating forces from said ram means to the stripper means at the work station to render the stripper means at the work station ineffective to press the workpiece against said workpiece support surface as the punch at the work station is retracted, actuator means for effecting operation of said transfer means between the active condition in which the stripper means at the work station is effective to press the workpiece against said workpiece support surface during retraction of the punch at the work station and the inactive condition in which the stripper means at the work station is ineffective to press the workpiece against said workpiece support surface during retraction of the punch at the work station, detector means for detecting when said transfer means has been operated to one of said conditions, and control means for initiating operation of said ram means to move a punch through an operating cycle only after de-

tection by said detector means that said transfer means is in either said active or inactive condition.

11. A turret punch press as set forth in claim 10 wherein each of said stripper means includes a stripper element disposed between said upper and lower turrets and defining opening through which an associated one of said punches passes to engage a workpiece, a plurality of stripper support members fixedly connected with said stripper element and movably mounted on said upper turret, and stripper springs operatively interconnecting said stripper support members and said lower turret to bias said stripper element upwardly against said upper turret, said transfer means including resilient drive means for transmitting force from said ram means and for enabling said ram means to move relative to the stripper means at the work station when the workpiece is pressed against said support surface with a predetermined force, a transfer member, and a plurality of transfer pins mounted on said transfer member, said transfer pins being effective to transmit force between said drive means and the stripper means at the work station when said transfer means is in the active condition, said transfer pins being movable axially relative to the stripper means at the work station by said drive means when said transfer means is in the inactive condition to thereby render said transfer pins ineffective to transmit forces between said drive means and the stripper means at the work station.

12. A turret punch press as set forth in claim 10 wherein said control means includes means for effecting rotation of said upper and lower turrets to move one of said punches and the associated one of said stripper means to the work station in accordance with a predetermined program and means for effecting operation of said transfer means between the active and inactive conditions in accordance with the predetermined program.

13. A turret punch press for performing work operations on a workpiece with a tool, said punch press comprising a base, an upper turret rotatably mounted on said base, a lower turret rotatably mounted on said base and at least partially defining a workpiece support surface, ram means for effecting relative movement between the tool and said upper and lower turrets to move the tool through an operating cycle which includes moving the tool into engagement with the workpiece and retracting the tool from the workpiece, selectively operable stripper means mounted on said upper turret and actuatable under the influences of forces transmitted to said stripper means from said ram means to press the workpiece against the workpiece support surface on said lower turret as the tool is retracted from the workpiece by said ram means, transfer means operatively connected with said stripper means and said ram means for transmitting actuating forces from said ram means to said stripper means during an operating cycle of said punch press, said transfer means being operable between an active condition in which said transfer means is effective to transmit actuating forces from said ram means to said stripper means to render said stripper means effective to press the workpiece against said workpiece support surface on said lower turret as the tool is retracted and an inactive condition in which said transfer means is ineffective to transmit actuating forces from said ram means to said stripper means to render said stripper means ineffective to press the workpiece against said workpiece support surface as

5 the tool is retracted, actuator means for effecting operation of said transfer means between the active condition in which said stripper means is effective to press the workpiece against said workpiece support surface during retraction of the tool and the inactive condition in which said stripper means is ineffective to press the workpiece against said workpiece support surface during retraction of the tool, and control means for initiating operation of said ram means to move the tool 10 through an operating cycle when said transfer means is in either said active or inactive condition.

14. A turret punch press as set forth in claim 13 wherein said stripper means includes a stripper element disposed between said upper and lower turrets and defining opening through which the tool passes to engage a workpiece, a plurality of stripper support members fixedly connected with said stripper element and movably mounted on said upper turret, and stripper springs operatively interconnecting said stripper support members 15 and said lower turret to bias said stripper element upwardly against said upper turret, said transfer means including resilient drive means for transmitting force from said ram means and for enabling said ram means to move relative to said stripper means when the workpiece is pressed against said support surface with a predetermined force by said stripper means, a transfer member, and a plurality of transfer pins mounted on said transfer member, said transfer pins being effective to transmit force between said drive means and said stripper means when said transfer means is in the active condition, said transfer pins being movable axially relative to said stripper means by said drive means when said transfer means is in the inactive condition to thereby render said transfer pins ineffective to transmit forces between said drive means and said stripper means.

15. A turret punch press as set forth in claim 13 wherein said control means includes means for effecting operation of said transfer means between the active and inactive conditions in accordance with a predetermined program.

16. A turret punch press for performing work operations on a workpiece, said punch press comprising a base, an upper turret rotatably mounted on said base, a plurality of punches mounted on said upper turret, a lower turret rotatably mounted on said base and at least partially defining a workpiece support surface, drive means for rotating said turrets to move each of the punches in turn to a work station, ram means at the work station for effecting relative movement between one of the punches and said upper and lower turrets to move the one punch through an operating cycle which includes moving the one punch into engagement with the workpiece and retracting the one punch from the workpiece, a plurality of selectively operable stripper means mounted on said upper turret, each of said stripper means being associated with one of said punches and being actuatable at the work station under the influences of forces transmitted to the stripper means at the work station from said ram means to press the workpiece against the workpiece support surface on said lower turret as the punch at the work station is retracted from the workpiece by said ram means, transfer means operatively connected with said ram means for transmitting actuating forces from said ram means to each of said stripper means in turn at the work station during operating cycles of said punch press, said trans-

fer means being operable between an active condition in which said transfer means is effective to transmit actuating forces from said ram means to a stripper means at the work station to render the stripper support surface on said lower turret as the punch at the work station is retracted and an inactive condition in which said transfer means is ineffective to transmit actuating forces from said ram means to the stripper means at the work station to render the stripper means at the work station ineffective to press the workpiece against said workpiece support surface as the punch at the work station is retracted, actuator means for effecting operation of said transfer means between the active condition in which the stripper means at the work station is effective to press the workpiece against said workpiece support surface during retraction of the punch at the work station and the inactive condition in which the stripper means at the work station is ineffective to press the workpiece against said workpiece support surface during retraction of the punch at the work station, and control means for initiating operation of said ram means to move a punch through an operating cycle when said transfer means is in either said active or inactive condition.

17. A turret punch press as set forth in claim 16 wherein each of said stripper means includes a stripper element disposed between said upper and lower turrets and defining opening through which an associated one of said punches passes to engage a workpiece, a plurality of stripper support members fixedly connected with 30

said stripper element and movably mounted on said upper turret, and stripper springs operatively interconnecting said stripper support members and said lower turret to bias said stripper element upwardly against said upper turret, said transfer means including resilient drive means for transmitting force from said ram means and for enabling said ram means to move relative to the stripper means at the work station when the workpiece is pressed against said support surface with a predetermined force, a transfer member, and a plurality of transfer pins mounted on said transfer member, said transfer pins being effective to transmit force between said drive means and the stripper means at the work station when said transfer means is in the active condition, said transfer pins being movable axially relative to the stripper means at the work station by said drive means when said transfer means is in the inactive condition to thereby render said transfer pins ineffective to transmit forces between said drive means and the stripper means at the work station.

18. A turret punch press as set forth in claim 16 wherein said control means includes means for effecting rotation of said upper and lower turrets to move one of said punches and the associated one of said stripper means to the work station in accordance with a predetermined program and means for effecting operation of said transfer means between the active and inactive conditions in accordance with the predetermined program.

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