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Hallenbeck et al.

[11] **3,799,031**

[45] **Mar. 26, 1974**

[54] **HOT STAMPING PRESS MACHINE**

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[21] Appl. No.: **282,843**

[52] **U.S. Cl.** **91/189,** 92/129, 92/140

[51] **Int. Cl.** **F01b 7/00,** F01b 1/00

[58] **Field of Search** ..... 91/189, 170; 18/30 L; 425/450; 92/61, 129, 140

[56] **References Cited**

UNITED STATES PATENTS

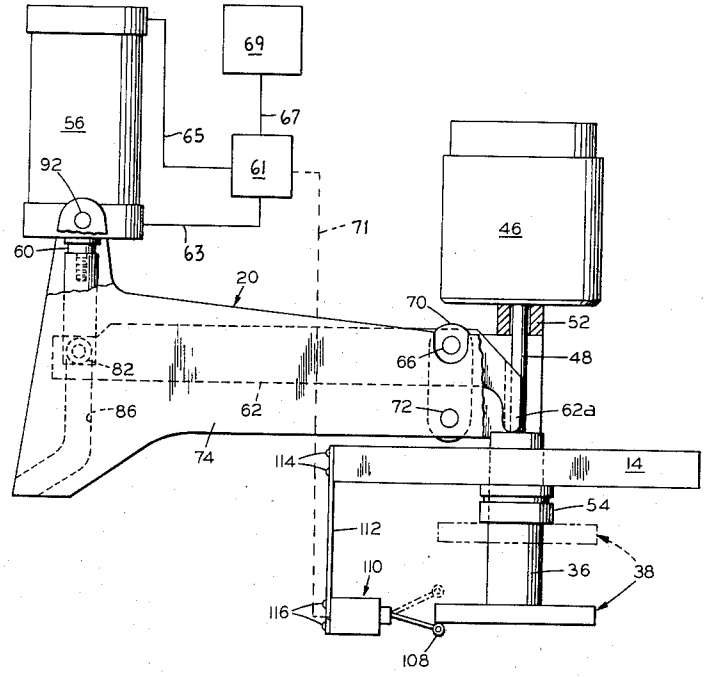
371,188	4/1943	Von Opel	18/30 LM
2,343,495	3/1944	Campbell	91/189
2,498,264	2/1950	Goldhard	18/30 LV
2,805,447	9/1957	Voges	18/30 LV
3,107,886	10/1963	Bossler, Jr.	91/189
3,141,382	7/1964	Oldfield et al.	91/189

Primary Examiner—Paul E. Maslousky

[57] **ABSTRACT**

A hot stamping press which is particularly adapted for use with foil and multicolor film includes a ram which carries affixed to its lower end an operating head which supports the foil, the die, etc. The operating head of the ram is driven into engagement with a fixed bed by means of a first air cylinder. In order to increase the pressure applied by the ram, the subject hot stamping press is provided with a second air cylinder operatively connectable through a mechanical lever mechanism to the ram such that as the operating head of the ram moves to strike the workpiece under the action of the first air cylinder, the second air cylinder is actuated. This results in the inner end of the mechanical lever mechanism being brought to bear upon the upper end of the ram, thus causing increased pressure to be applied throughout the operating head. This increased pressure reaches a predetermined level at a point prior to the termination of the ram's downward stroke and remains constant as the ram moves through the final portion of its downward travel.

7 Claims, 5 Drawing Figures



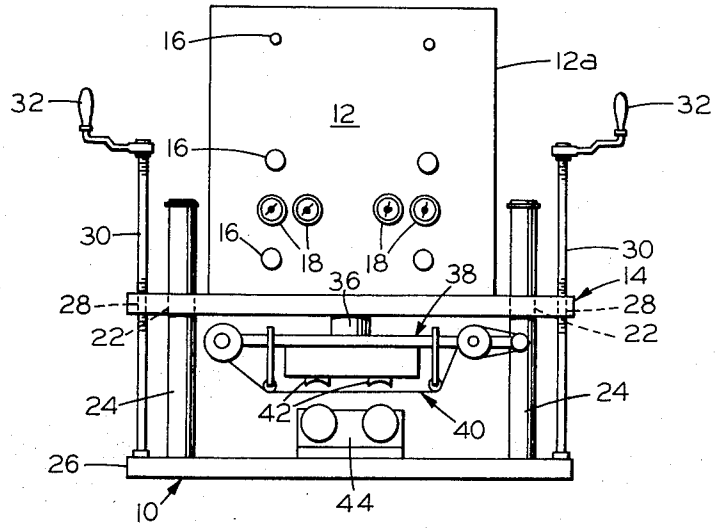

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12a
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FIG. 1

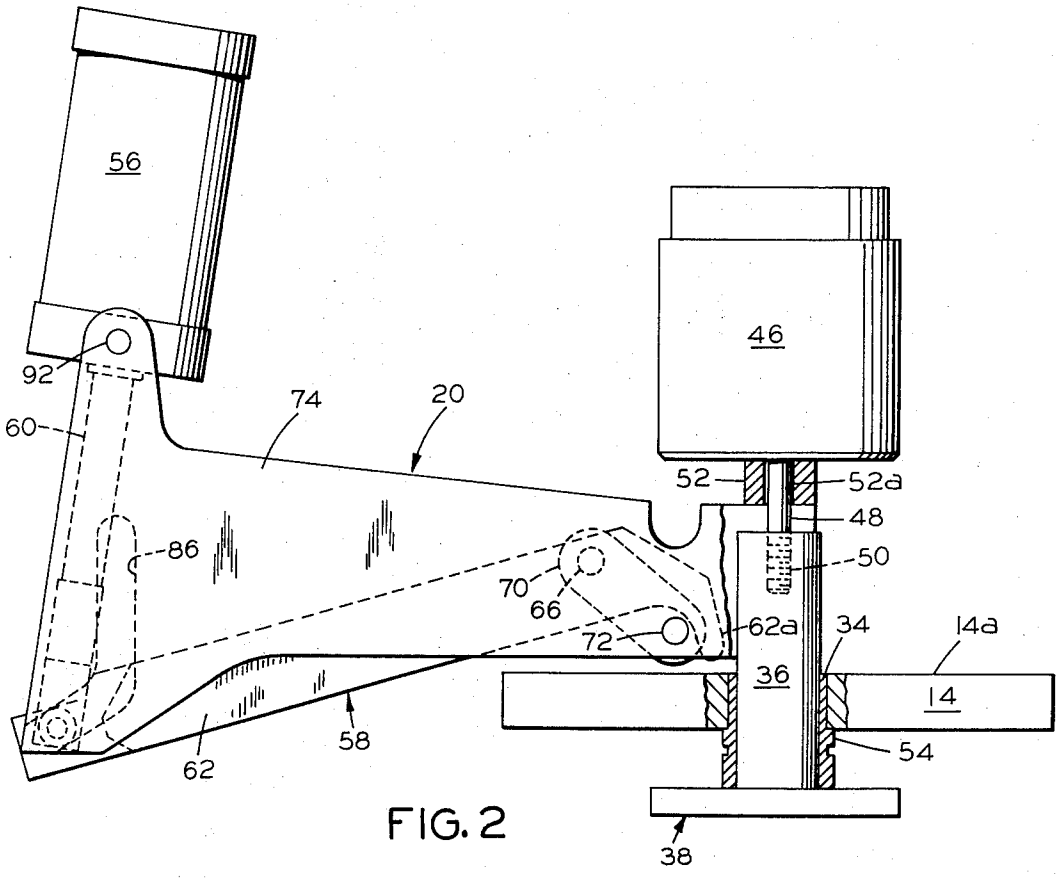

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74
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52a
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FIG. 2

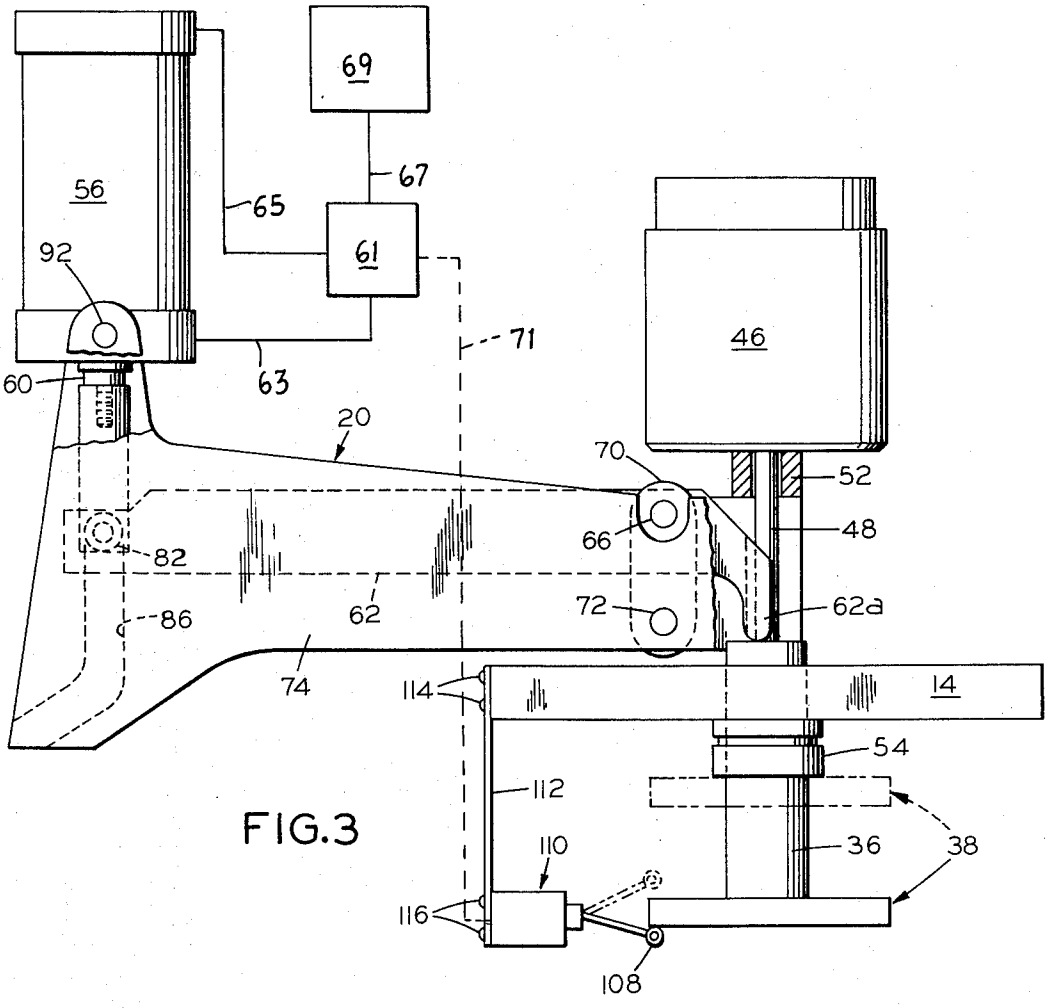

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114
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112
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110
116
108

FIG.3

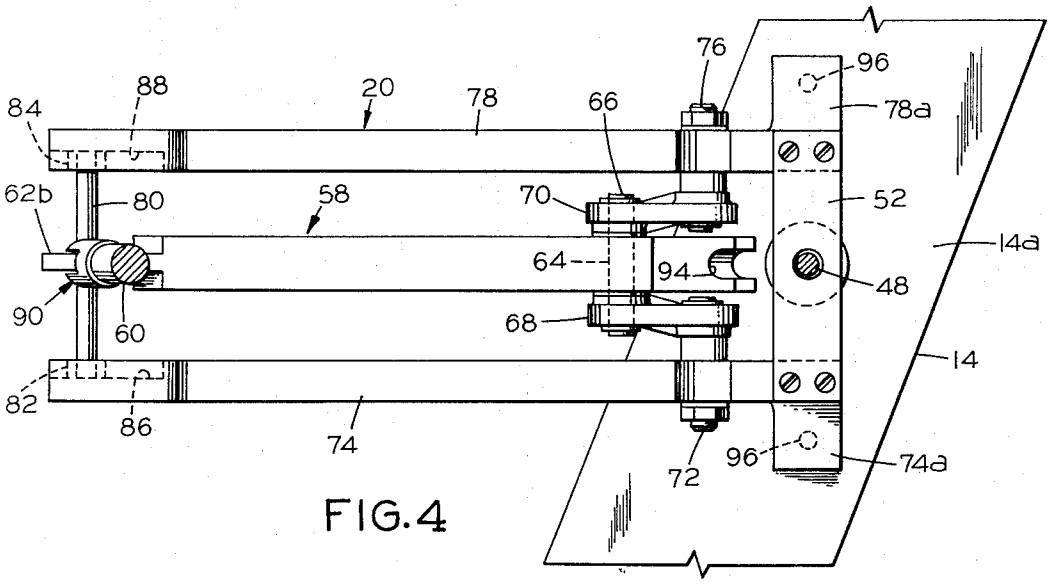

76
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88
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78a
62b
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94
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74a

FIG.4

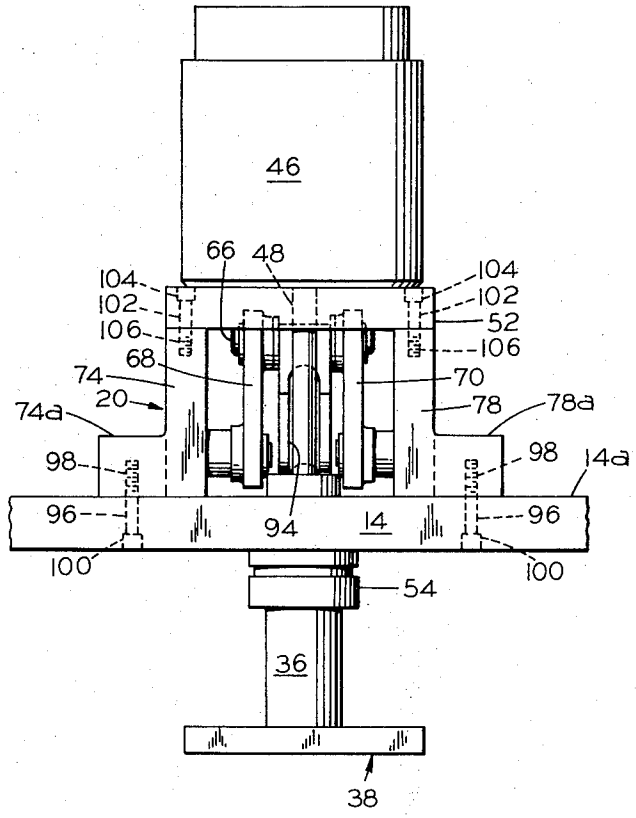

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78a
14a

FIG.5

HOT STAMPING PRESS MACHINE

BACKGROUND OF THE INVENTION

In accordance with the prior art as known here to date, hot stamping presses commonly have included a ram operatively connected to an air cylinder such as to be driven thereby into engagement with a workpiece. The conventional practice has been to mount the air cylinder in line with the ram. Thus, the amount of pressure that is to be applied through the ram to the work has been directly proportional to the amount of force provided by the air cylinder. A disadvantage, however, of this approach is that the air cylinder is limited insofar as concerns the total amount of pressure which it can drive practically.

As is evident from a review of the prior art, a number of different approaches have been tried in an effort to obviate the aforedescribed limitation. None of these attempts, however, have proven entirely successful here to date. In part, this is due to the fact that proper operation of a hot stamping press depends upon the successful coaction between a number of interrelated operating variables. Thus, it has been found, for example, that commonly when the structure and/or mode of operation of a hot stamping press has been modified in an attempt to obviate the aforedescribed limitation, the net result of the modification has been merely to provide a hot stamping press which actually suffers from some other disadvantages caused by a disruption in the coaction which previously existed between two or more of the aforereferenced interrelated operating variables.

Some of the different types of operating variables which must be taken into consideration are, for example, the temperature level to which the die is heated, the length of time during which the operating head is in engagement with the work, the rate at which work is fed to the press, the amount of pressure applied by the ram to the work, etc. In addition, consideration must also be given to the degree of repeatability capable of being achieved with the press insofar as concerns duplicating the same operating conditions for each work cycle whereby to provide similar workpieces with identical stampings.

Accordingly, it is an object of the present invention to provide a novel and improved hot stamping press which in addition to having a first pressure means for driving the ram also includes a second pressure means operable for increasing the amount of pressure applied throughout the operating head of the ram and thereby the amount of pressure imparted to a workpiece.

It is also an object of the present invention to provide such a hot stamping press wherein the second pressure means operates to move the ram with a constant predetermined pressure during a measurable portion of the final travel of the ram in its downward stroke.

Another object of the present invention is to provide such a hot stamping press wherein the second pressure means comprises an air cylinder operatively connectable through a mechanical lever mechanism to the ram.

A further object of the present invention is to provide such a hot stamping press which achieves all of the foregoing objects while still maintaining the desired coaction between all various operating components of the press such that there is provided a high degree of repeatability between successive stamping operations.

SUMMARY OF THE INVENTION

It has now been found that the foregoing and related objects can be readily attained in a hot stamping press particularly adapted for use with foil and multicolor film wherein there is embodied a ram which is operated through air pressure in a first cylinder. The ram carries affixed to its lower end an operating head which supports the foil, the die, etc. In order to increase the pressure capable of being applied through the operating head to a workpiece, the subject hot stamping press further includes a second cylinder which is operatively connectable through a mechanical lever mechanism to the ram and which functions when operatively connected thereto to thereby augment pressure capable of being provided by the first cylinder.

In accordance with the preferred embodiment of the invention, the aforementioned mechanical lever mechanism includes a lever arm which has one end thereof pivotally mounted to a rod. The opposite ends of the rod in turn are mounted for movement in a pair of substantially L-shaped tracks suitably provided for this purpose in plates supported on the frame of the hot stamping press. The aforereferenced end of the lever arm is also pivoted to the outwardly moving end of the piston rod of the second air cylinder. The second air cylinder itself is pivotally mounted to the aforesaid track bearing plates and thereby to the frame of the press. The other end of the lever arm extends adjacent to the periphery of the ram and is pivotally mounted to the upper ends of a pair of links. The lower ends of the pair of links are pivotally mounted in a fixed position to the aforedescribed track bearing plates. As the operating head moves to stroke the workpiece, means cause actuation of the second air cylinder. Inasmuch as the piston rod of the second air cylinder is normally in an extended position when the second air cylinder is in an unactuated condition, actuation of the second air cylinder causes the piston rod to retract. As the piston rod retracts, the rod pivotally attached thereto is caused to move upwardly within the aforedescribed pair of substantially L-shaped tracks. This upward movement of the rod is in turn transmitted to the end of the lever arm pivotally attached thereto. As this movement of the lever arm occurs, the links to which the other end of the lever arm is pivotally attached pivot causing the end of the lever arm associated therewith to bear against the upper end of the top of the ram thus applying increased pressure throughout the operating head and thereby to the workpiece.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevational view of a hot stamping press in accordance with the present invention;

FIG. 2 is a side elevational view of the pressure applying means of the hot stamping press of FIG. 1 in accordance with the present invention, illustrated in the inoperative position;

FIG. 3 is a side elevational view similar to FIG. 2 of the pressure applying means of the hot stamping press of FIG. 1 in accordance with the present invention, illustrated in the operative position;

FIG. 4 is a top plan view of the pressure applying means of the hot stamping press of FIG. 1 in accordance with the present invention with portions thereof

being broken away for purposes of clarity of illustration; and

FIG. 5 is a front elevational view of the pressure applying means of the hot stamping press of FIG. 1 in accordance with the present invention.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENT

Referring now to FIG. 1 of the drawing, there is illustrated therein a hot stamping press, generally designated by reference numeral **10**, embodying the present invention. The hot stamping press **10** is particularly adapted for use with foil and multicolor film. As illustrated in FIG. **1**, hot stamping press **10** includes a control panel **12** suitably supported on the upper surface **14***a* of an adjustable upper plate **14**. The control panel **12** preferably includes a front surface **12***a* on which are suitably mounted the switches **16** and gauges **18** utilized in controlling the operation of the press **10**. Housed within the control panel **12** is the electrical circuitry (not shown) which interconnects in circuit relationship the switches **16** and gauges **18** and the operating components of the press **10** electrically controlled thereby. In addition, a portion of pneumatically operated pressure applying means **20** which is illustrated in FIGS. **2**, **3**, **4** and **5** of the drawings and which will be subsequently described in detail hereinbelow is also housed within control panel **12**.

Plate **14** is provided with a first pair of openings **22** suitably spaced for receiving a pair of posts **24** on which plate **14** is supported such as to be capable of movement relative thereto. Posts **24** in turn are each fixedly attached at one end to lower fixture plate **26**. Plate **14** further includes a pair of threaded openings **28** for receiving a pair of threaded members **30**. The latter members **30** each have one end thereof suitably supported for rotation on lower fixture plate **26**, and are provided at the other end thereof with a handle portion **32**. In accord with the embodiment of the hot stamping press **10** depicted in FIG. **1**, each of the two posts **24** and each of the two threaded members **30** are offset relative to each other. More particularly, in order to provide a larger area into which work may be fed to the press **10**, the posts **24** and the threaded members **30** are preferably positioned on the lower fixture plate **26** such as to pass through diagonally spaced corners of plate **14**.

As best seen with reference to FIG. **2**, plate **14** is provided with another opening **34** substantially centrally located therein through which ram **36** of pressure applying means **20** projects in a downwardly direction. Ram **36** as seen in FIG. **1** has affixed to its lower end an operating head assembly **38** which includes foil means **40** and die means **42**. By means of the handles **32**, each of the threaded members **30** may be rotated whereby to enable plate **14** to be raised or lowered such as to adjust the position of operating head assembly **38** relative to the fixed bed **44** which is suitably supported on lower fixture plate **26** so as to be aligned with the path of movement of operating head assembly **38**.

Referring now to FIG. **3** of the drawings, pressure applying means **20** includes a first operating cylinder **46** which is operatively connected to ram **36**. An assembly comprising a piston (not shown) having a piston rod **48** affixed thereto is suitably supported for movement within the cylinder **46** such that at least a portion of the piston rod **48** is capable of being retracted within the cylinder **46** and extended outwardly of one end of the cylinder **46**. In accordance with the embodiment of the invention depicted in the drawings, first operating cylinder **46** preferably comprises an air cylinder wherein air under pressure is utilized to cause the extension of piston rod **48** relative to the aforementioned one end of cylinder **46**. However, it is to be understood that, if so desired, other types of pneumatically or hydraulically operated cylinders might be substituted for the cylinder **46** without departing from the essence of the present invention.

To accomplish the operative interconnection between first operating cylinder **46** and the ram **36** one end of piston rod **48** as shown in FIG. **2** is threaded into a suitably threaded opening **50** provided for this purpose in one end of ram **36**. In accord with the embodiment of the invention depicted in the drawings, there is also provided, adjacent the end of cylinder **46** through which piston rod **48** projects, a suitable support member **52** having an opening **52a** therein through which the piston rod **48** extends before engaging the ram **36**. Opening **52***a* is suitably dimensioned such that piston rod **48** is free to move therewithin.

As noted previously, plate **14** is provided with an opening **34** capable of receiving the ram **36** as the latter is caused to move as a result of movement being imparted to the piston rod **48**. Preferably opening **34** as shown in FIG. **2** is provided with a bushing **54** which functions as a guide and aligning means for the ram **36** as the latter moves within the opening **34**.

In accordance with the mode of operation of air cylinder **46**, the latter drives ram **36** between a first position, illustrated in dotted lines in FIG. **3**, wherein the operating head assembly **38** carried by the ram **36** is out of engagement with a workpiece (not shown) suitably supported on fixed bed **44**, the latter being shown in FIG. **1**, and a second position illustrated in solid lines in FIG. **3** wherein the operating head assembly **38** engages the aforementioned workpiece. Actuation of the air cylinder **46** is controlled by means of the previously described switches **16** which are mounted on the front surface **12***a* of control panel **12**.

Pressure applying means **20** further includes a second operating cylinder **56** and a mechanical lever mechanism **58**. By means of the latter mechanism **58**, operating cylinder **56** is operatively connectable to the ram **36**, in a manner to be more fully described hereinbelow. Unlike cylinder **46** which is mounted in a suitable manner (not shown) in control panel **12** behind the front surface **12***a* thereof, cylinder **56** is suitably mounted to the rear of control panel **12**. Further, cylinder **56** preferably also includes an assembly comprising a piston (not shown) having a piston rod **60** affixed thereto such as to be movable in unison with the piston as the latter is caused to move within cylinder **56**. In accordance with the embodiment of the invention depicted in the drawings, second operating cylinder **56** comprises an air cylinder wherein air under pressure is imparted to move the piston between a first position wherein piston rod **60** as shown in FIG. **2** projects outwardly from one end of cylinder **56** in a fully extended position, and a second position wherein the piston rod **60** is in its retracted position as shown in FIG. **3** with at least a portion of the piston rod **60** still projecting from one end of cylinder **56**. The aforedescribed movement of the piston rod **60** of cylinder **56** is accomplished in a manner well-known to those skilled in the

art through the use of a conventional solenoid operated valve **61**, schematically depicted in FIG. **3** of the drawings, which is operatively connected by means of conduits **63** and **65** to the opposite ends of the cylinder **56** and by conduit **67** to a suitable fluid source **69**. The solenoid operated valve **61** in a manner which is referred to subsequently is connected in electrical circuit relation through lead **71** with limit switch **110** whereby the fluid flow paths between the fluid source **69** and the respective ends of the cylinder **56** are established in response to the particular existing operation condition of the limit switch **110**. One form of commercially available solenoid operated valve which has been found to be particularly suited for employment in the hot stamping press **10** is a multiport valve marketed as a Series **408B** valve by the Automatic Valve Company of Farmington, Michigan. However, it is to be understood that if so desired other types of pneumatically or hydraulically operable cylinders may be substituted for the air cylinder **56** without departing from the essence of the present invention.

Turning now to a consideration of mechanical lever mechanism **58**, the latter includes a lever arm **62** which as will be described more fully hereinafter is pivotally mounted for movement between a first position wherein one end **62***a* of lever arm **62** engages the top of ram **36** as shown in FIG. **3** of the drawings, and a second position wherein the end **62***a* of lever arm **62** as depicted in FIG. **2** is out of engagement with the ram **36**. Adjacent end **62***a*, lever arm **62** is suitably provided with an opening **64** for receiving a shaft **66** to which at either end thereof, as best seen with reference to FIG **4**, there is suitably affixed a link **68** and **70**, respectively. The other end of link **68** is affixed to a shaft **72** which is suitably supported in an opening provided for this purpose in a plate like member **74**. In similar fashion, the other end of link **70** is affixed to a shaft **76** which is suitably supported in an opening provided for this purpose in another platelike member **78**.

As illustrated in FIG. **4**, the other end **62***b* of lever arm **62** is pivotally mounted on a rod **80**. Each end of the rod **80** is suitably provided with a roller **82** and **84**, respectively. The rollers **82** and **84** in turn ride in a pair of substantially L-shaped tracks **86** and **88**, respectively, which are formed in the inner side wall portions of platelike members **74** and **78**, respectively. End **62***b* of lever arm **62** is also pivotally attached, as shown in FIG. **4**, by suitable means **90** to the outwardly moving end of the piston rod **60** of the second air cylinder **56**. Air cylinder **56** itself is pivotally mounted by pivot members **92**, only one of which is visible in the drawings, to the plate like members **74** and **78**.

Referring again to FIG. **4** of the drawings, the end **62***a* of lever arm **62** is provided with a slot **94** for the purpose of providing clearance for the piston rod **48** of first air cylinder **46** when the lever arm **62** moves to the position illustrated in FIG. **3** of the drawings, i.e., the position wherein the end **62***a* of lever arm **62** engages the top of ram **36**. Also, as can be seen with reference to FIGS. **4** and **5**, each of the platelike members **74** and **78** is provided with a foot portion **74***a* and **78***a*, respectively. The latter foot portions **74***a* and **78***a* are fastened to the upper surface **14***a* of plate **14** by suitable means such as, for example, fasteners **96** which are threadably received within openings **98** provided for this purpose in the foot portions **74***a* and **78***a*, and which pass through openings **100** suitably provided in plate **14** such as to be alignable with the openings **98**. In addition, each of the platelike members **74** and **78** is also fastened through the use of suitable means, such as the fasteners **102**, to the support member **52** referred to previously hereinabove. The fasteners **102** pass through openings **104** provided for this purpose in support member **52** and are threadably received in openings **106** provided for this purpose in platelike members **74** and **78** in aligned relation with the openings **104**.

The mode of operation of the pressure applying means **20** will now be set forth. Ram **36** which carries the operating head assembly **38** affixed to its lower end is operated through air pressure in a first operating cylinder **46**. As the result of air pressure being applied thereto, the ram **36** and more specifically the operating head assembly **38** carried thereby is driven into engagement with a workpiece suitably supported on the fixed bed **44** whereby to cause a stamping operation to be performed on the workpiece. In order to increase the pressure capable of being applied by the operating head assembly **38** to a workpiece, the hot stamping press **10** further includes a second operating cylinder **56** which is operatively connectable through a mechanical lever mechanism **58** to the ram **36** and which functions when operatively connected thereto to thereby augment the pressure capable of being provided by the first operating cylinder **46**. In this connection, it has been shown that the use of mechanical lever means **58** increases in the order of three times the effective pressure capable of being applied to the workpiece.

As the ram **36** moves in its downward stroke, the amount of pressure to be exerted by the combined first and second operating cylinders **46** and **56**, respectively, builds up to a preset level which is reached at a point in the ram's downward stroke located at a distance of about one inch from the end of the ram's downward travel. This distance may be varied, however, if so desired. Thereafter, this preset level of pressure is maintained during the remainder of the ram's travel in its downward stroke. This characteristic is important inasmuch as it ensures that the same constant pressure will be applied to workpieces of the same type which vary dimensionally relative to each other by small amounts. In contrast to the above, many machines, known in the prior art, are capable of applying a preset level of pressure to the workpiece at only one point, i.e., normally at the termination of the ram's downward stroke. Thus, such machines are incapable of applying the same preset level of pressure to workpieces having differing dimensional tolerances.

As the operating head assembly **38** moves into contact with the workpiece, a portion of the operating head assembly **38** engages as illustrated in FIG. **3** of the drawings the switch arm portion **108** of limit switch **110**. Switch **110** is mounted in spaced relation below plate **14** and in the path of movement of operating head assembly **38** by a support **112** having one end thereof suitably fastened by means of fasteners **114** to the plate **14** and its other end suitably fastened by means of fasteners **116** to the limit switch **110**. As the operating head assembly **38** engages the switch arm portion **108**, it causes the latter to move from the dotted line position thereof shown in FIG. **3** to the solid line position thereof which is also depicted in FIG. **3**. This movement of the switch arm portion **108** results in actuation of the limit switch **110**. The latter switch **110** is connected in series circuit relationship by circuit means

(not shown) to one of the switches **16** mounted on the front surface **12***a* of the control panel **12.** The latter switch comprises a pressure switch which is actuated in response to the first operating cylinder **46** reaching a preestablished pressure. Actuation of the aforesaid pressure switch subsequent to the actuation of limit switch **110** causes actuation of the second operating cylinder **56.** Thus, switch **110** in essence functions as an interlock inasmuch as irrespective of the fact that the pressure switch has been actuated, second operating cylinder **56** will only be actuated if limit switch **110** has also been actuated by virtue of the downward movement of the operating head assembly **38.** Actuation of the cylinder **56** causes the piston rod **60** to retract inasmuch as the piston rod **60** of the second operating cylinder **56** is normally in an extended position when the cylinder **56** is in an unactuated condition. As the piston rod **60** retracts, the rod **80** pivotally attached thereto is caused to move upwardly, as viewed with reference to FIGS. **2** and **3,** within the pair of substantially L-shaped tracks **84** and **86.** This upward movement of the rod **80** is in turn transmitted to the end **62***b* of the lever arm **62** pivotally attached thereto. As this movement of the lever arm **62** occurs, the links **68** and **70** to which the other end **62***a* of the lever arm **62** is pivotally attached pivot causing the end **62***a* of the lever arm **62** associated therewith to bear against the top of the ram **36** thus applying additional pressure throughout the operating head assembly **38** and thereby to the workpiece.

It should also be understood, however, that other modes of coaction between the switch **110** and the pressure switch may be employed in the hot stamping press **10** without departing from the essence of the inventionn. Thus, for example, if so desired, actuation of the limit switch **110** may be utilized to cause actuation of the second operating cylinder **56.** In accordance with this mode of operation, the pressure switch would be caused to actuate first such as to condition the circuit whereby when actuation of the limit switch **110** occurs by virtue of the engagement thereby by the operating head assembly **38,** actuation of the second operating cylinder **56** would take place. In addition, if so desired, various time delay means might also be employed as a means of causing the actuation of the second operating cylinder **56** at a predetermined point in the downward portion of the cycle of operation of the ram **36.**

Therefore, it can be seen that the present invention provides a novel and improved hot stamping press which in addition to having a first pressure means for driving the ram also includes a second pressure means operable for increasing the amount of pressure applied throughout the operating head assembly of the ram and thereby the amount of pressure imparted to a workpiece. In accordance with the mode of operation of the hot stamping press of the present invention, the second pressure means operates to move the ram with a constant predetermined pressure during a measurable portion of the final travel of the ram in its downward stroke. As employed in the hot stamping press of the subject invention, the second pressure means comprises an air cylinder operatively connected through a mechanical lever mechanism to the ram. Finally, in accord with the present invention there is provided a hot stamping press having the capability of providing additional pressure to the workpiece while yet still maintaining the desired coaction between the various components of the press such that there is provided a high degree of repeatability between successive stamping operations.

Having thus described the invention, we claim:

1. A hot stamping press apparatus for stamping a piece of work comprising:

a. a ram having an operating head assembly affixed to one end thereof;

b. first pressure means for driving said ram from a first position wherein said operating head assembly is out of engagement with a workpiece to a second position wherein said operating head assembly is in engagement with a workpiece, said first pressure means comprising a first operating cylinder operatively connected to the other end of said ram;

c. second pressure means operative when said ram is in said second position to provide an increase in the pressure applied by said operating head assembly to the workpiece, said second pressure means comprising a second operating cylinder and mechanical lever means;

i. said mechanical lever means including a lever arm having one end thereof operatively connected to said second operating cylinder, and means pivotally mounting said lever arm for movement from a first position wherein said lever arm is ineffective to impart pressure to said ram to a second position wherein said lever arm is effective to impart pressure to said ram and therethrough to said operating head assembly;

d. a source of fluid supply;

e. valve means fluidically connected in circuit relation with said source of fluid supply and said second operating cylinder; and

f. means connected in circuit relation with said valve means to control the operation of said valve means thereby to cause actuation of said second operating cylinder, as said ram moves to said second position thereof wherein said operating head assembly engages the workpiece, to cause said lever arm to move to said second position thereof, wherein said lever arm is effective to impart additional pressure to said ram.

2. A hot stamping press apparatus as set forth in claim **1** wherein said means pivotally mounting said lever arm comprises a pair of platelike members, a pair of links and a rod, said pair of platelike members each having a substantially L-shaped track formed therein, said pair of links each having one end thereof pivotally mounted to said lever arm and the other end thereof pivotally mounted to a corresponding one of said pair of platelike members, said rod being operatively connected to said second operating cylinder and to said lever arm, and said rod further having each of its ends mounted for movement in a corresponding one of said substantially L-shaped tracks such that upon actuation of said second operating cylinder said rod is caused to move within said substantially L-shaped tracks thereby causing said lever arm operatively connected thereto to pivot from said first position thereof to said second position thereof.

3. A hot stamping press apparatus as set forth in claim **2** wherein said first operating cylinder comprises a first air cylinder, said second operating cylinder comprises a second air cylinder, and said first and second air cylinders operate to apply a constant preset level of

pressure during the final portion of the movement of said ram from said first position thereof to said second position thereof.

4. A hot stamping press apparatus as set forth in claim **1** wherein said means for actuating said second operating cylinder comprises a limit switch having a switch arm portion and switch means connected in series circuit relationship with said limit switch, said limit switch being mounted with said switch arm portion thereof in the path of movement of said operating head assembly such that as said operating head assembly moves into engagement with the workpiece said operating head assembly engages said switch arm portion of said limit switch thereby actuating said limit switch, and said switch means being actuatable in response to said first operating cylinder reaching a pre-established pressure such that the actuation of said switch means subsequent to the actuation of said limit switch controls the operation of said valve means to cause actuation of said second operating cylinder.

5. A hot stamping press apparatus for stamping a piece of work comprising:

a. a ram having an operating head assembly affixed to one end thereof;

b. a first operating cylinder operatively connected to the other end of said ram, said first operating cylinder operating to drive said ram from a first position wherein said operating head assembly is out of engagement with a workpiece to a second position wherein said operating head assembly is in engagement with the workpiece;

c. pressure means operative when said ram is in said second position to provide an increase in the pressure applied by said operating head assembly to the workpiece, said pressure means comprising a second operating cylinder and mechanical lever means;

i. said mechanical lever means comprising a lever arm, a pair of platelike members, a pair of links and a rod, said pair of platelike members each having a track formed therein, said pair of links each having one end thereof pivotally mounted to said lever arm and the other end thereof pivotally mounted to a corresponding one of said pair of platelike members, said rod being operatively connected to said second operating cylinder and to said lever arm, and said rod further having each of its ends mounted for movement in a corresponding one of said tracks such that upon actuation of said second operating cylinder said rod is caused to move within said tracks thereby causing said lever arm operatively connected thereto to pivot from a first position wherein said lever arm is ineffective to impart pressure to said ram to a second position wherein said lever arm is effective to impart pressure to said ram and therethrough to said operating head assembly;

d. a source of fluid supply;

e. valve means fluidically connected in circuit relation with said source of fluid supply and said second operating cylinder; and

f. switch means connected in circuit relation with said valve means to control the operation of said valve means thereby to cause actuation of said second operating cylinder as said first operating cylinder drives said ram from said first position thereof to said second position thereof to cause said lever arm to move to said second position thereof wherein said lever arm is effective to impart additional pressure to said ram.

6. A hot stamping press apparatus as set forth in claim **5** wherein said switch means includes a limit switch having a switch arm portion mounted in the path of movement of said operating head assembly such that as said operating head assembly moves into engagement with the workpiece said operating head assembly engages said switch arm portion of said limit switch thereby actuating said limit switch, and a switch actuatable in response to said first operating cylinder reaching a preestablished pressure such that the actuation of said switch subsequent to the actuation of said limit switch controls the operation of said valve means to cause actuation of said second operating cylinder.

7. A hot stamping press apparatus as set forth in claim **6** wherein said first operating cylinder comprises an air cylinder, said second operating cylinder comprises an air cylinder, and said first and second operating cylinders operate to apply a constant preset level of pressure during the final portion of the movement of said ram from said first position thereof to said second position thereof.

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