Jan. 19, 1965 H. A. BRANDTJEN, JR 3,166,009

SQUEEZE IMPACT PRESS FOR LEAF STAMPING, EMBOSSING AND THE LIKE

Filed Dec. 26, 1962 2 Sheets-Sheet 1

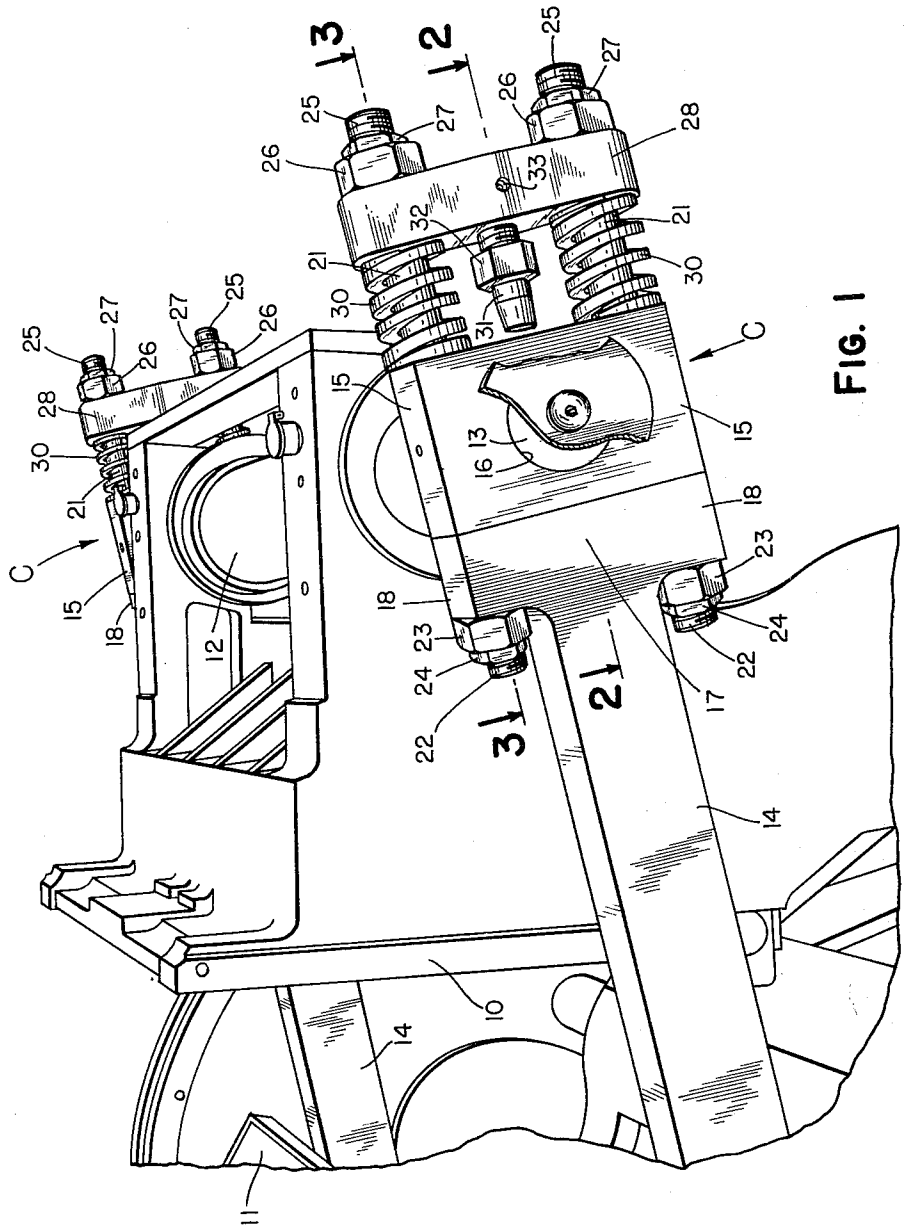


FIG. 1

INVENTOR.
HENRY A. BRANDTJEN JR.

BY Caswell, Lagaard + Hicks
ATTORNEYS

Jan. 19, 1965 H. A. BRANDTJEN, JR 3,166,009

SQUEEZE IMPACT PRESS FOR LEAF STAMPING, EMBOSSING AND THE LIKE

Filed Dec. 26, 1962 2 Sheets-Sheet 2

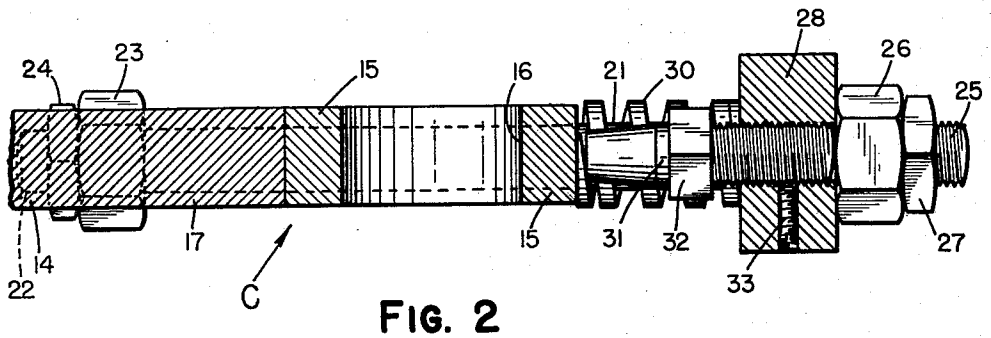


FIG. 2

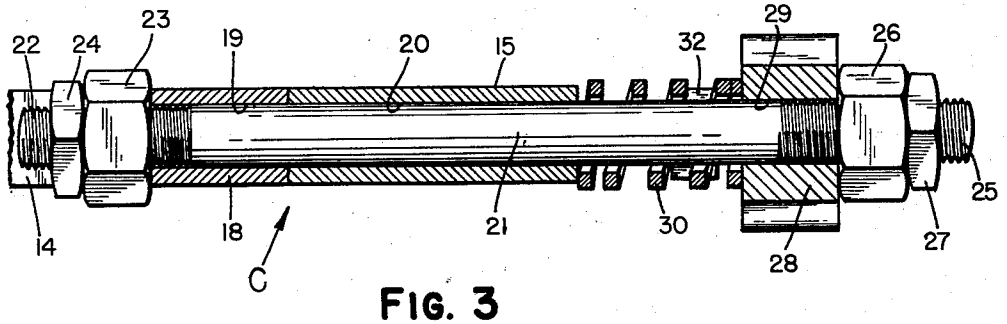


FIG. 3

INVENTOR.
HENRY A. BRANDTJEN JR.
BY Cannell, Lagand + Wicks
ATTORNEYS

United States Patent Office 3,166,009
Patented Jan. 19, 1965

3,166,009

SQUEEZE IMPACT PRESS FOR LEAF STAMPING, EMBOSSING AND THE LIKE

Henry A. Brandtjen, Jr., 589 Montcalm Place, St. Paul, Minn.

Filed Dec. 26, 1962, Ser. No. 247,124
7 Claims. (Cl. 101—10)

My invention relates to presses adapted to leaf stamping, embossing and the like, particularly to printing presses capable of performing such operations.

In leaf stamping, it is common to heat the impression plate or die which impresses the leaf material into the stock, transferring the leaf material to the stock from backing material coated with wax to which the leaf material adheres, the result of such heating being to soften the backing material and the wax and leaf material thereon for the ready release of the leaf material from the backing material and the ready impression of the leaf material into the stock. In embossing operations, it is advantageous to heat the male die for heat transfer to fibrous stocks. In each of said operations, it is important that a relatively prolonged period of impressional engagement be had to provide a sufficiently long interval of time for the effective transference of heat from the heated die to the work.

Bed and platen printing press of the well-known Gordon type having crank driven side arms for rocking the bed have been used in hot leaf stamping and embossing, but at sacrificially low press speeds in order to provide enough time during an impression period for transfer of sufficient heat to the work from the heated die.

An object of the present invention is to provide in a press novel and effective yielding means for relatively prolonging impressional engagement between a working element carried by one member of an impression-producing couple and stock to be worked carried by the other member of the couple, one member of which is moved forth and back in work and return throws toward and from the other couple member, a further object of the invention being to provide stop means for limiting the yielding action of said yielding means, a still further object of the invention being to provide stop means which is adjustable variably to limit the action of said yielding means.

Another object of the invention is to provide means, for the purposes aforesaid, in a press wherein movement is imparted to the movable couple member by a reciprocating arm, such yielding means being associated with said arm.

A further object of the invention is to provide means for the purposes aforesaid in a press wherein a reciprocating drive arm has a connection with the movable couple member for moving the same, such means being incorporated in said connection.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

FIG. 1 is a fragmentary perspective view of a conventional bed and platen printing press of the Gordon type showing a form of the present invention applied thereto in association with the connection between the bed and one of the bed-rocking side arms.

FIG. 2 is a sectional view in detail taken as on the line 2—2 of FIG. 1.

FIG. 3 is a sectional view in detail taken as on the line 3—3 of FIG. 1.

The printing press construction illustrated in FIG. 1 of the drawings typically includes a rocking bed 10 and

platen 11. As usual, a back shaft 12 rockably mounted transversely in the bed is formed at its ends with pivot studs 13. Corresponding ends of reciprocating side arms 14 have connections pivotally connecting said arms with the pivot studs 13 on the back shaft 12, the opposite ends of said side arms 14 being connected with a drive crank (not shown) in accordance with common practice.

The reciprocating side arms 14, in their cycle of movement, have a work throw and a return throw. On their work throw, they move the bed 10 toward the platen 11 and, in the final stage of the work throw, said arms effect impressional engagement between type or other working element on the bed 10 and a sheet of paper or other stock carried by the platen 11. In a press of this nature, there is conventionally nothing short of a drastic reduction in normal press speeds for substantially prolonging the normal relatively brief period of impressional engagement between the working element and the stock to be worked, during the final stage of the work throw of the side arms 14. However, by so reducing press speeds, printing presses of the nature aforesaid have been used conventionally in hot leaf stamping and embossing. In so using such a press, in the stamping of gold or other leaf material on stock such as a book cover for example, the operator places the cover to be stamped on the platen 11 and mounts on the bed 10 a suitable heating element for supporting and heating a die. And further mounted on the bed is a supply of leaf-faced backing material of desired form in which the leaf material is adhered as usual to the backing therefor, as by means of a thin layer of wax on the backing. During the impression period, the hot die on the bed 10 presses against the stock on the platen 11 with the backed leaf material therebetween, the length of the period of impressional coaction between the hot die on the bed 10 and the book cover on the platen 11, even at greatly reduced press speeds, being barely sufficient for the transference of enough heat from the die to the book cover, through the backed leaf material, satisfactorily to soften the backing material, the wax adherent and leaf material and the material of the book cover.

It likewise has been found, in the use of conventional presses of the aforesaid type for embossing that the periods of time available for impressional engagement between hot die and stock are not desirably long enough for the transfer of heat from die to stock.

The present invention applied to a press of the nature aforesaid well adapts it to use in hot leaf stamping, embossing and the like, at normally high press speeds, providing amply long impression periods for the transfer of heat in sufficient amount from die to stock.

The illustrated form of the invention resides in connections C supplied in association with the side arms 14 and the pivot studs 13 on the back shaft 12 of the bed 10. Each connection C includes a bearing block 15 formed with a central bore 16 therein in which its respective pivot stud 13 is journalled. The corresponding end of the corresponding drive arm 14 has a breast portion 17 forming lugs 18 extending upwardly and downwardly from the arm 14, said breast portion 17 of said arm 14 being adapted normally to butt against said bearing block 15. Each of the lugs 18 is formed with a bore 19 therein paralleling the longitudinal axis of the arm 14 and each such bore 19 has an axially aligned companion bore 20 in the bearing block 15. Each pair of the aligned bores 19, 20 in said lugs 18 and bearing block 15 receives a tie rod 21 having a threaded terminal portion 22. On such terminal portion 22 of each such tie rod 21 is an abutment nut 23 and a lock nut 24 therefor, the abutment nut 23 engaging its respective lug 18 in opposition to the bearing block 15. Each bore 20

in said bearing block 15 receives its respective tie rod 21 slidably, such rod extending considerably beyond the bearing block 15 opposite the breast portion 17 of the arm 14 and ending in a threaded terminal portion 25 on which is threaded an adjusting nut 26 and a lock nut 27.

A head block 28, carried by the tie rods 21, is formed with a pair of bores 29 therein which slidably receive said rods 21. Encircling each rod 21 is a helical spring 30, the same being compressed between the bearing block 15 and the head block 28. Urged by the springs 30 the head block 28 bears against the nuts 26 on the tie rods 21, such nuts being adjusted suitably to tension said springs 30. Located between the tie rods 21 is a stop screw 31 which is threaded into the head block 28 and extends toward the bearing block 15 for endwise abutment thereagainst.

Acting through the tie rods 21, head block 28, springs 30 and bearing block 15, a side arm 14 of the press, on its work throw, swings the bed 10 toward the platen 11 without flexing the springs 30. However, at the outset of impressional engagement between the working element on the bed 10 and the stock on the platen 11, in the final stage of the work throw of the arm 14, said springs 30 begin to yield and continue to yield until the yielding thereof is arrested, at or near the end of the final stage of the work throw of the arm 14, so that impressional engagement between working element and stock is solidly "bottomed out" before the beginning of the return throw of the arm 14.

The threaded stop screw 31, having a shouldered flange 32 for turning the same, is adapted to be turned in the head block 28 for endwise adjustment therein to bring the stop screw 31 into abutment with the bearing block 15 variably ahead of the end of the work throw of the arm 14. A set screw 33 threaded into the head block 28 into engagement with the stop screw 31 fixes said stop screw in adjusted relationship.

It will be understood that in a press employing the present invention, the make ready will be such as to accommodate whatever adjustment is given to the adjustable stop screw 31 for causing an impression to bottom out solidly following a prolonged period of yielding impressional engagement between the working element on the bed 10 and the worked stock on the platen 11.

In the interest of balancing the forces exerted on parts of each connection C, the parallel tie rods 21 are oppositely equally spaced from a plane common to the axis of the pivot stud 13 on the bed 10 of the press and the longitudinal axis of the corresponding arm 14 of the press, and the stop screw 31 is disposed in axial coincidence with said plane and the plane common to the axes of said tie rods 21.

Changes in the specific form of the invention, as herein described, may be made within the scope of what is claimed without departing from the spirit of the invention.

Having described the invention, what is claimed as new and desired to be protected by Letters Patent is:

1. A press having a platen and a bed with a pivot stud thereon, the bed being movable toward and back from the platen, the platen being adapted to support stock to be worked, the bed being adapted to support a working medium for impressional engagement with stock on the platen, a reciprocating drive arm for moving the bed, said arm being driven from one end thereof and having a work throw wherein it is adapted to move the bed toward the platen and in the final stage of said throw to effect impressional engagement between the working element on the bed and the stock on the platen, said arm having a return throw wherein the working element on the bed is retracted from the stock on the platen; in combination with a connection pivotally connecting the other end of the arm of the press with the bed, said

connection including a bearing block journalled on the pivot stud of the bed and normally abutted by said other end of the arm of the press, a pair of parallel tie rods issuing from said arm, said rods being slidably guided by said bearing block and extending therebeyond, a head block slidably mounted on said rods, each rod having a helical spring encircling the same and compressed between the bearing block and head block, a spring tensioning nut threaded on each of said rods and bearing against the head block in opposition to its respective spring, said springs being adapted upon initiation of impressional engagement between the working element on the bed of the press and the stock on the platen to yield during a period of such engagement, an adjustable stop screw threaded at one end into said head block for longitudinal adjustment, said stop screw being positioned for abutment at its free end against the bearing block, said stop screw being adapted upon abutment with the bearing block, in the different adjustments of said screw, variably to limit the compression of said springs and thereby variably limit the length of the period of yielding impressional engagement between working element and stock following the same with a solid bottoming out of the impression, said tie rods being oppositely equally spaced from a plane containing the axis of the pivot stud on the bed of the press and the longitudinal axis of the reciprocating arm, said stop screw, being in axial coincidence with said plane and with a plane common to the axes of said tie rods.

2. A press having a platen and a bed with a pivot stud thereon, the bed being movable toward and back from the platen, the platen being adapted to support stock to be worked, the bed being adapted to support a working medium for impressional engagement with stock on the platen, a reciprocating drive arm for moving the bed, said arm being driven from one end thereof and having a work throw wherein it is adapted to move the bed toward the platen and in the final stage of said throw to effect impressional engagement between the working element on the bed and the stock on the platen, said arm having a return throw wherein the working element on the bed is retracted from the stock on the platen; in combination with a connection pivotally connecting the other end of the arm of the press with the bed, said connection including a bearing block part journalled on the pivot stud of the bed and normally abutted by said other end of the arm of the press, a pair of tie rods issuing from said arm, said rods being slidably guided by said bearing block part and extending therebeyond, a head block part slidably mounted on said rods, each rod having a helical spring encircling the same and compressed between the bearing block part and head block part, each of said rods having an abutment member thereon bearing against the head block part in opposition to its respective spring, said springs being adapted upon initiation of impressional engagement between the working element on the bed and the stock on the platen to yield during a period of such engagement, a stop interposed between the bearing block part and head block part and mounted at one portion thereof on one of said parts, said stop being positioned for engagement at its opposite portion with the other of said parts and being adapted upon engagement with said last part to arrest the compression of said springs and thus limit the length of the period of yielding impressional engagement between working element and stock following the same with a solid bottoming out of the impression.

3. The combination defined in claim 2 wherein the stop is adjustable relative to the part on which it is mounted, thereby variably to limit the compression of said springs and thus variably limit the length of the period of yielding impressional engagement between working element and stock.

4. The combination defined in claim 2 wherein said

abutment members on the rods are nuts threaded thereon for adjustably tensioning said compression springs.

5. A press having a pair of impression members, one adapted to support stock thereon to be worked and the other adapted to support a working element thereon for impressional engagement with the stock on said first member, one impression member being movable toward and from the other impression member and having a pivot stud thereon, a reciprocating drive arm structure for moving said movable impression member, said arm structure having a work throw and a return throw and adapted on its work throw to move said movable impression member toward the other member and in the final stage of said work throw to effect impressional engagement between the working element on the one impression member and the stock on the other impression member, said arm structure being adapted on its return throw to retract said working element from the worked stock; in combination with a connection between said reciprocating arm structure and said movable impression member, said connection including an end portion of the reciprocating arm structure and an abutment portion thereof spaced from said end portion lengthwise of the arm structure, a bearing block journaled on the pivot stud of the movable impression member, means slidably connecting said bearing block with the arm structure between said end portion and said abutment portion of said arm structure, a helical spring compressed between said bearing block and said end portion of said arm structure, said spring normally yieldingly holding said bearing block against said abutment portion of the arm structure and acting yieldingly to impart movement from the arm structure to the bearing block on the work throw of said arm structure, said arm structure moving relative to the bearing block against the action of said spring upon the occurrence of impressional engagement between working element and stock, said spring yieldingly resisting such relative movement of the arm structure with respect to the bearing block during a period following occurrence of impressional engagement, and adjustable abutment stop means interposed between said end portion of the arm structure and said bearing block and backed against one thereof in position to abut the other, thus to arrest the spring-resisted movement of the arm structure relative to the bearing block, said stop means limiting adjustably such spring-resisted movement of the arm structure relative to said bearing block, thereby variably terminating the period of yielding impressional engagement with a solid bottoming out of the impression more or less ahead of the end of the work throw of the reciprocating arm structure.

6. A press having a pair of impression members, one adapted to support stock thereon to be worked and the other adapted to support a working element thereon for impressional engagement with the stock on said first member, one impression member being movable toward and from the other impression member and having a pivot stud thereon, a reciprocating drive arm structure for moving said movable impression member, said arm structure having a work throw and a return throw and adapted on its work throw to move said movable impression member toward the other member and in the final stage of said work throw to effect impressional engagement between the working element on the one impression member and the stock on the other impression member, said arm structure being adapted on its return throw to retract said working element from the worked stock; in combination with a connection between said reciprocating arm structure and said movable impression member, said connection including a bearing block journaled on the pivot stud of the movable impression member, means movably connecting said bearing block with the reciprocating arm structure for relative movement between bearing block and arm structure lengthwise of the latter, a spring interposed between and engaging said bearing block and said reciprocating arm structure, said spring yieldingly imparting movement from the reciprocating arm structure to the bearing block on the work throw of said arm structure, said arm structure moving relative to the bearing block against the action of said spring upon the occurrence of impressional engagement between working element and stock, said spring yieldingly resisting such relative movement of the arm structure with respect to the bearing block during a period following occurrence of impressional engagement, and abutment stop means interposed between said reciprocating arm structure and said bearing block and backed against one thereof in position to abut the other, thus to arrest the spring-resisted movement of the arm structure relative to the bearing block, thereby terminating the period of yielding impressional engagement with a solid bottoming out of the impression ahead of the end of the work throw of the reciprocating arm structure.

7. A press as defined in claim 6, wherein the abutment stop means is adjustable for adjustably limiting the spring-resisted movement of the arm structure relative to the bearing block, thereby variably terminating the period of yielding impressional engagement with the solid bottoming out of the impression more or less ahead of the end of the work throw of the reciprocating arm structure.

References Cited by the Examiner

UNITED STATES PATENTS

1,681,905	8/28	Scuse	101—302
1,835,096	12/31	Schwarz	74—582
1,966,417	7/34	Parmele	101—287 X
2,547,331	4/51	Lent	101—27 X

WILLIAM B. PENN, *Primary Examiner.*

ROBERT E. PULFREY, *Examiner.*