

June 24, 1952

T. F. STACY

2,601,341

TRANSFER MOLDING PRESS

Filed Feb. 10, 1950

2 SHEETS—SHEET 1

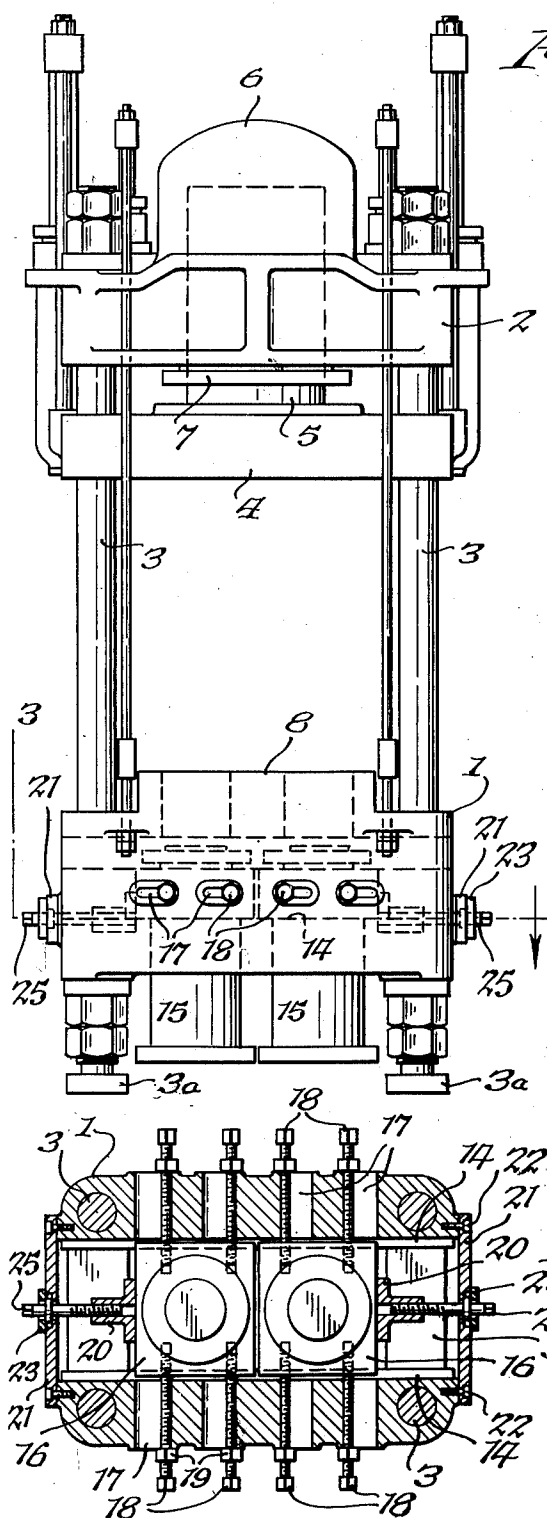


Fig. 1.

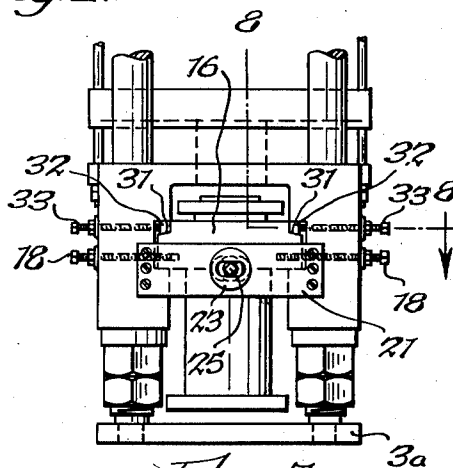


Fig. 4.

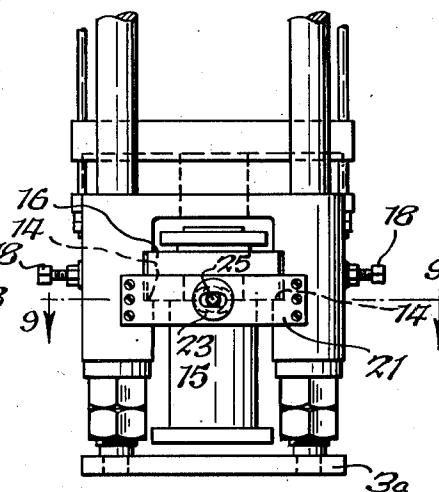


Fig. 2.

Fig. 3.

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2 SHEETS—SHEET 2

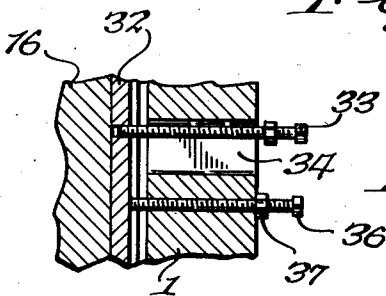
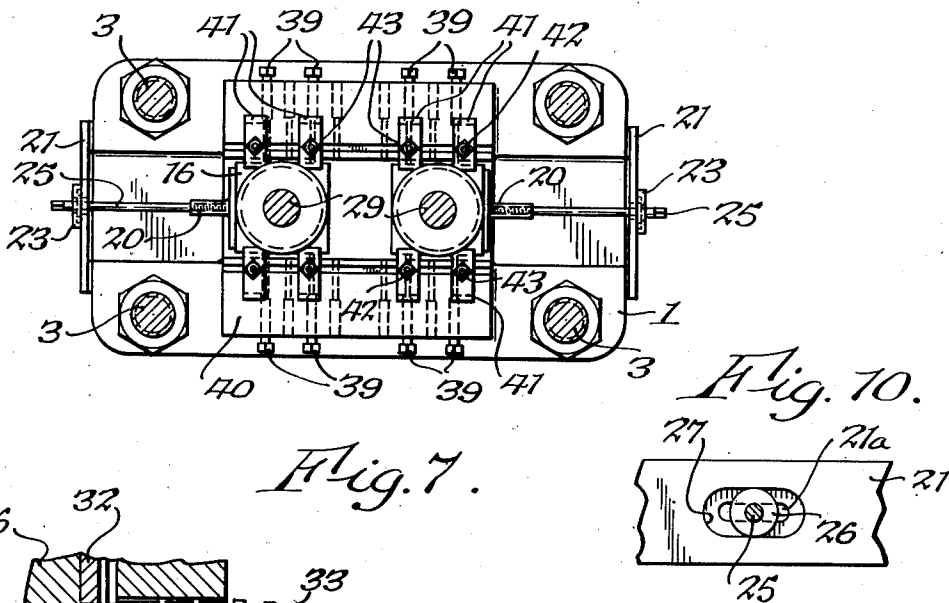
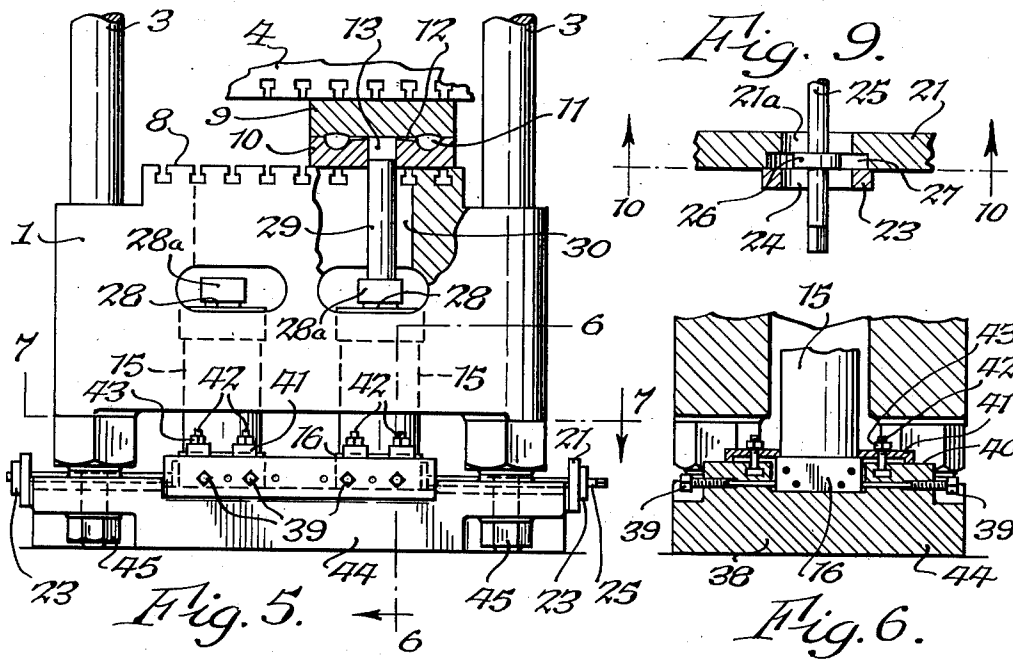


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UNITED STATES PATENT OFFICE

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TRANSFER MOLDING PRESS

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9 Claims. (Cl. 18—30)

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This invention relates to transfer molding presses, and particularly to those in which the mold sections are closed and held closed, and a hydraulic transfer cylinder is operated to perform a transfer molding.

An object of the invention is to improve presses of this type and make them more convenient to use, and which will be relatively simple, compact, efficient and inexpensive.

Another object is to provide an improved press construction that will facilitate accurate alignment of the transfer piston with the mold sections; in which raising of the upper mold section will expose the recess in the other section for reception of a charge of molding material; in which the transfer piston may be easily arranged, accurately concentric with the transfer passage in the lower mold section; in which wear on the mold and transfer piston will be reduced; and in which adjustments for different mold sections may be easily and conveniently made.

Other objects and advantages will be apparent from the following description of some embodiments of the invention, and the novel features will be particularly pointed out hereinafter in connection with the appended claims.

In the accompanying drawings:

Fig. 1 is a front elevation of a transfer molding press constructed in accordance with this invention;

Fig. 2 is an end elevation of the lower part of the same;

Fig. 3 is a sectional plan of the same, the section being taken approximately along the line 3—3, Fig. 1;

Fig. 4 is an end elevation similar to Fig. 2, but illustrating a modification thereof;

Fig. 5 is a front elevation of the lower part of the press, also constructed in accordance with the invention, but illustrating another embodiment thereof;

Fig. 6 is a transverse, sectional elevation of a portion of the same, the section being taken approximately along the line 6—6, Fig. 5;

Fig. 7 is a sectional plan of the same, the section being taken approximately along the line 7—7, Fig. 5.

Fig. 8 is a sectional plan of a portion of the press shown in Fig. 4, the section being taken approximately along the line 8—8, Fig. 4;

Fig. 9 is a sectional plan of an end part of the base shown in Fig. 2; and

Fig. 10 is a sectional elevation of the same, the section being taken approximately along the line 10—10, Fig. 9.

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In the embodiment of the invention illustrated in Figs. 1—3, the press may be of any suitable type used in transfer molding, including a base 1, a head 2 disposed above and in spaced relation to the base 1, and strain rods 3 connecting the head and base to form therewith a press frame. Guided by the frame rods 3 is a platen 4 which reciprocates vertically in the space between the head 2 and the base 1. Connected to the upper face of the platen 4 is a piston 5 which extends upwardly into the downwardly opening face of a hydraulic cylinder 6 which is formed within the head 2. The piston 5 and cylinder 6 form a hydraulic ram which advances the platen towards the head 2 to close the dies and hold them clamped in closed relation under a selected heavy pressure. Suitable retraction cylinders are provided for retracting the platen or elevating it when the mold sections are to be opened, and pressure on the piston 5 has been released. A stuffing gland 7 surrounds the piston 5 at its entrance to the cylinder 6 to prevent leakage of operating liquid, as usual in hydraulic rams. To this extent this press is typical of hydraulic presses and, therefore, it has been described only briefly, since the other details do not specifically enter into the press combination to which the invention is directed.

The base 1 is provided with a relatively flat upper face 8 on which the lower mold sections may be mounted, the press, as shown, being adapted to mount two complete individual molds on the face 8. In Fig. 5 one of such molds is illustrated in section, the upper mold part or section 9 being secured to the under face of the platen 4, as usual, the lower section 10 being secured upon the upper face of the base 1. The two sections 9 and 10 of each mold are complementary and have, between their parting faces mold cavities 11 which are connected by sprue passages 12 to a cylindrical transfer passage 13 that extends from the parting face of mold section 10 downwardly through its lower face, and in which the transfer piston reciprocates, as will appear later herein. In Figs. 1—3 the mold sections 9 are secured to the underface of platen 4, and the sections 10 are secured to the face 8 of the base.

In the interior chamber or opening in the base 1, having ledges 14 on its side walls, are disposed individual hydraulic cylinders 15. These cylinders 15 are disposed side by side and each cylinder 15 has, near its upper end, a horizontal, outwardly extending flange 16 in the nature of a head. These heads 16 rest on the shoulders or

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ledges 14 on the wall of the base chamber, as shown in Figs. 2 and 3. The width or distance across each head 16 is less than the distance across the opening or chamber in the base 1, so that while the head 16 of each cylinder rests upon and is supported by the ledges 14, the head 16 can be shifted forwardly and rearwardly on the ledges 14 as well as in directions from end to end. Each side of the base 1 is provided with horizontal slots 17 which are horizontally elongated and at a level just above the ledges 14. Screws 18 extend along these slots from the outside of the base to the opening in the base, and each screw is threaded into the head 16 of one of the cylinders 15, so that when the screw is turned it will be threaded into or out of the head 16, depending upon the direction in which the screw is turned.

Each screw carries a lock 19 that abuts against the outer face of base 1, so that when the screw is turned to thread it into the head 16, it will pull the head toward that side of the base in which that screw is disposed. The lock nut on each screw, by engaging with the base 1, gives an anchorage for the screw to enable it to pull the head 16 toward it, and by holding the screw from turning and at the same time turning the lock nut to the right, the same effect will be obtained which is to pull the head 16 toward that side of the base. Of course, when the screws on one side of the base are operated to pull the head 16 toward that side of the base, the screws at the opposite side of the base and connected to the same head should be loosened an equivalent amount. Similarly, each head 16 carries a boss 20 on its outer end face.

A bar or plate 21 extends across the end of the opening in the base, as shown in Figs. 2 and 3. Bar 21 is secured to the base at opposite sides of the interior opening by screws 22. The bar 21 has an aperture 21a which is elongated horizontally, and secured upon the outer face of bar 21 is a circular disc 23 also having a horizontally elongated slot 24 thereon that is aligned with slot 21a. A screw 25 passes through the slots 21a and 24 and is threaded into the boss 20. Within the bar 21, the screw 25 is provided with a circular collar or flange 26. The bar 21 is also provided with a horizontally elongated recess 27, see Fig. 10, in its outer face beneath the disc 23. The disc 26 slides horizontally and bodily in the recess 27 while free to rotate therein. When the screw 25 is rotated, the flange 26, which is rotatably confined in the bar 21, prevents endwise movement of screw 25, and therefore the boss 20 acts as a nut and is moved endwise in one direction or the other, depending upon the direction in which the screw 25 is turned. By turning the screw 25 to the right, it pulls the head 16 toward the end of the press and outwardly, during which the screws 18 may slide laterally of themselves in the horizontally elongated slots 17 of the base. Each cylinder 15 in Fig. 3 may be shifted in any direction entirely independently of the other cylinder. Thus, by a selective operation of the screws 18 and 25, each of the cylinders 15 may be shifted horizontally and individually in all directions by a slow motion, due to the screws, for a purpose which will appear presently.

Each cylinder 15 is open at its upper end and receives therein an upstanding piston 28, see Fig. 5, which reciprocates vertically therein. The ram, provided by each cylinder 15 and its piston 28, is a double acting ram. A smaller transfer piston 29, Fig. 5, is coupled to the upper end of

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each ram piston 28 and extends upwardly and loosely through a slot 30 in the upper face of the base 1. It is extremely important that the piston 29 be accurately positioned relatively to and aligned with the passage 13 of the lower mold section, and the adjustment provided by the clamping means that secures the mold section 10 to the base 1 does not facilitate accurate positioning of the mold section 10. Furthermore, the mold sections 9 and 10 must be properly aligned with each other. By the horizontal adjustment of the cylinders 15, one is able to horizontally adjust each transfer piston laterally in its slot 30 in a manner to bring it into accurate alinement with a transfer cylinder 13 of a mold section.

In the modification of the invention illustrated in Figs. 4 and 8, the construction is similar to that shown in Figs. 1-3, except that the upper face of each head 16 is bevelled off at 31 at the front and rear, so as to provide inclined ledges at the front and rear of the head 16. These ledges 31 are upwardly inclined toward the central axis of the cylinder. A wedge block 32 is disposed on each ledge 31, and additional screws 33 are provided in slots 34 in the base. These screws 33 are threaded to wedge block 32 so that when the screw is turned, it will be threaded into and out of the wedge block. Companion screws 35 provided with lock nuts 37 are threaded into the base 1 and have their ends abutting the wedge 32.

After adjustments of the cylinder 15 are made by means of the screws 18 and 25, the screws 33 are turned in a direction to push the wedges into locking engagement and thus prevent any up or down movement of the cylinder 15 when the machine is in use. The screws 33 are used to loosen the wedges from locking engagement with the ledges 31. When it is desired to make a new adjustment with a new mold, this is done by first loosening the screws 36 and then turning the screws 33 so that their ends butt against the head 16 and force the wedge out of locking engagement.

In the modification shown in Figs. 5-7, the construction is similar to that shown in Figs. 1-3 and 7 and 8, except that each cylinder 15 has its head 16 at the lower instead of the upper end, and the head 16 rests upon a cross part 38 of the base, as shown in Fig. 6. Screws 39 pass through the base and engage opposite sides of the head 16, so as to push it forwardly and rearwardly as the screws 39 at the front and rear are selectively adjusted. The base or cross part 38 has a flat upper face 40, see Fig. 6, which is slightly lower than the plane of the upper ledge of the head 16. A plurality of clamping plates 41 have one end of each resting on the face 40 and extend toward the cylinder 15, and have their other ends resting on the upper ledge of the head 16. Screws 42, each having a head anchored in a slot in the base part 38, extend upwardly through the face 40 and each passes through a clamping bar 41 and carries a nut 43 which, when tightened, will force that clamping plate 41 downwardly on the ledge of the head 16 and force it against the base part 38 and hold it firmly against any further movement until released. In this modification of the invention, the heads 16 are shifted endwise by means similar to that shown in Figs. 1-3, and the corresponding parts have similar numerals.

It will be observed that with this construc-

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tion, screw means are provided for shifting the lower cylinders in the base horizontally in all directions, with a slow motion, so that the transfer pistons 29 can be accurately positioned or located so as to slide freely in its related transfer passage 13 of a lower mold section.

In the use of the press, the platen 4 is caused to descend until the upper mold sections engage complemented mold sections 10 that are provided on the base 1, and then after the desired pressure is developed between the engaged mold sections, hydraulic pressure is created in the cylinders 15 to force the transfer pistons 29 upwardly in the lower mold sections. A charge of molding material that was disposed in each passage 13 while the related mold sections were separated, will be compressed by related piston 29 and transferred in liquid form into the cavities 11, as usual in transfer molding. When the platen 4 is elevated, the mold sections will be separated and the molded articles removed. Each passage 13 will then be open at the top so that a new charge of molding material may be placed in the passage 13, the platen advanced and the cycle repeated.

The base 1, is shown in Figs. 1 to 4, is of generally inverted U-shape, and the cross part of the U is provided with one or more openings 30 (Fig. 5) through which the transfer pistons 29 may operate. The cylinder or cylinders 15 are disposed between the arms or sides of the U and may be slid into and out of positions in the base, supported on ledges or shoulders 14 through the space between the arms, which would be through the ends of the press (Figs. 1 and 2). The bars 21 are removed while the cylinders are being inserted into or removed from the base. The lower ends of the strain rods 3 depend below the base 1 and there are connected by bars 3a. In Figs. 5 to 7, the base 1 is also of U-shape and a heavy plate 44 extends across the open end of the U and is attached to the lower ends of strain rods 3 by nuts 45. The cylinders 15 may be slid sidewise through the ends of the base 1, as explained for Figs. 1 to 4. As shown in Fig. 5, the extension pistons 29 may be detached from the pistons 28 at the couplings 28a, when the cylinders 15 are to be moved into or out of the base.

It will be understood that various changes in the details and arrangements of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claims.

I claim:

1. In a transfer molding press, a frame having a base, a head, and members connecting said base and head, said base having a generally flat upper face, a base mold section mounted on said upper face of said base, a cylinder provided in said head and having a piston movable downwardly and upwardly, toward and from said base, a platen guided by said members and attached to the lower end of said piston, a mold section complementary to that on said base, mounted on the lower face of said platen, said base mold section having a transfer passage extending from the upper face of that section to its lower face, a transfer piston in said base and movable vertically back and forth in said passage, a hydraulic ram in said base and connected to said transfer piston to operate it vertically, said ram and transfer piston being adjustable horizontally in

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all directions forwardly and rearwardly and end to end, screws engaging with both base and ram for shifting said ram horizontally on said base in crosswise horizontal directions, and elements adjustable on the base and engaging said ram to hold it in any of its adjusted positions, whereby the mold sections may be opened and closed by movements of said platen, and said transfer piston and its operating ram may be adjusted horizontally in all directions to aline said transfer piston with said passage.

2. A transfer molding press of the type employing complementary mold sections, a frame having a base, a head, and members connecting said head and base, said base having a generally flat upper face for mounting a lower mold section, a platen for mounting the other mold section guided by said members vertically toward and from said base, to close and separate said sections, a transfer piston disposed in said base and extending above said upper face to reciprocate in said lower mold section, a hydraulic ram in said base and connected to and operating said piston, said ram and piston being adjustable in said base horizontally in all directions to aline said piston vertically with said lower mold section, screws engaging with both base and ram for shifting said ram horizontally on said base in crosswise horizontal directions, a clamp acting between said base and ram for securing said ram in all adjusted positions relative to said base, and means mounted on said head for lowering said platen to close said mold sections and raising it to open said mold sections.

3. A transfer molding press comprising a frame having a base with a generally flat face for mounting a transfer mold section, a platen movable in said frame toward and from said flat face and formed for mounting a complementary mold section to be closed upon said transfer section when advanced and open when retracted, a hydraulic ram mounted in said base for limited movement therein horizontally in all directions, a transfer piston extending outwardly from said face toward said platen and operated in directions toward and from said platen by said ram, means carried by said frame for advancing and retracting said platen, and elements adjustable relatively to said base and engaging said ram to hold it in any of its positions into which it may be adjusted.

4. A transfer molding press comprising a frame having a base with a generally flat face for mounting a transfer mold section, a platen movable in said frame toward and from said flat face and formed for mounting a complementary mold section to be closed upon said transfer section when advanced and open when retracted, means carried by said frame for advancing and retracting said platen, a hydraulic ram mounted in said base for limited movement horizontally in all directions, a transfer piston connected to said ram for operation thereby to different extents through said flat face and movable horizontally with said ram, said base having horizontal surfaces for guiding said ram in said horizontal movement, and screw elements carried by said base and operable on said ram to shift it horizontally backwardly, forwardly and endwise, said screw elements and base having relative movement in a direction laterally of the screw elements to permit movement of the ram in all horizontal directions.

5. A transfer molding press comprising a frame having a base with a generally flat face for

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mounting a transfer mold section, a platen movable in said frame toward and from said flat face and formed for mounting a complementary mold section to be closed upon said transfer section when advanced and open when retracted, means carried by said frame for advancing and retracting said platen, said base having horizontal surfaces, a hydraulic ram confined to said horizontal surface but slidable thereon in all horizontal directions, screws threaded into said ram and reacting with said base to move said ram forwardly and rearwardly, additional screws threaded to said ram and rotatably confined to said base to move said ram endwise back and forth, each of said screws being movable laterally of itself relatively to said base while reacting therewith so as to follow movements of the ram on the base caused by the other screws.

6. A transfer molding press comprising a frame having a base with a generally flat face for mounting a transfer mold section, a platen movable in said frame toward and from said flat face and formed for mounting a complementary mold section to be closed upon said transfer section when advanced and open when retracted, means carried by said frame for advancing and retracting said platen, said base having horizontal surfaces, a hydraulic ram confined to said horizontal surface but slidable thereon in all horizontal directions, said base having horizontally extending slots in its front and rear walls and in an end wall, and screws passing through said slots, each threaded to said ram and having a collar reacting with said base to cause horizontal movement of said ram when the screw is rotated, and to hold it in adjusted position.

7. A transfer molding press comprising a frame having a base with a generally flat face for mounting a transfer mold section, a platen movable in said frame toward and from said flat face and formed for mounting a complementary mold section to be closed upon said transfer section when advanced and open when retracted, means carried by said frame for advancing and

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retracting said platen, said base having horizontal surfaces, a hydraulic ram confined to said horizontal surface but slidable thereon in all horizontal directions, said base having horizontally extending slots in its front and rear walls and in an end wall, screws passing through said slots, each threaded to said ram and having a collar reacting with said base to cause horizontal movement of said ram when the screw is rotated, and to hold it in adjusted position, and adjustable clamps carried by said base and overlying said ram to clamp it in adjusted position, to said horizontal surfaces.

8. A transfer molding press according to claim 7, said ram having inclined ledges at its opposite edge portions which said adjustable clamps overlie, and said adjustable clamps including wedge blocks disposed on said inclined ledges, and clamp members acting between said base and blocks to force the blocks against said inclined ledges and releasably hold the ram against movement.

9. A transfer molding press according to claim 7, said ram having inclined ledges at its opposite edge portions, and said adjustable clamps including wedge blocks disposed against said inclined ledges, screws for forcing said wedge blocks into wedging relation with said ledges for clamping the ram in adjusted position, and other screws also engaging said wedge blocks for moving them out of clamping engagement with said ledges.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,961,942	Pack	June 5, 1934
2,393,583	Cherry et al.	Jan. 29, 1946
2,478,823	Halbach	Aug. 9, 1949