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PRINTING PRESSES

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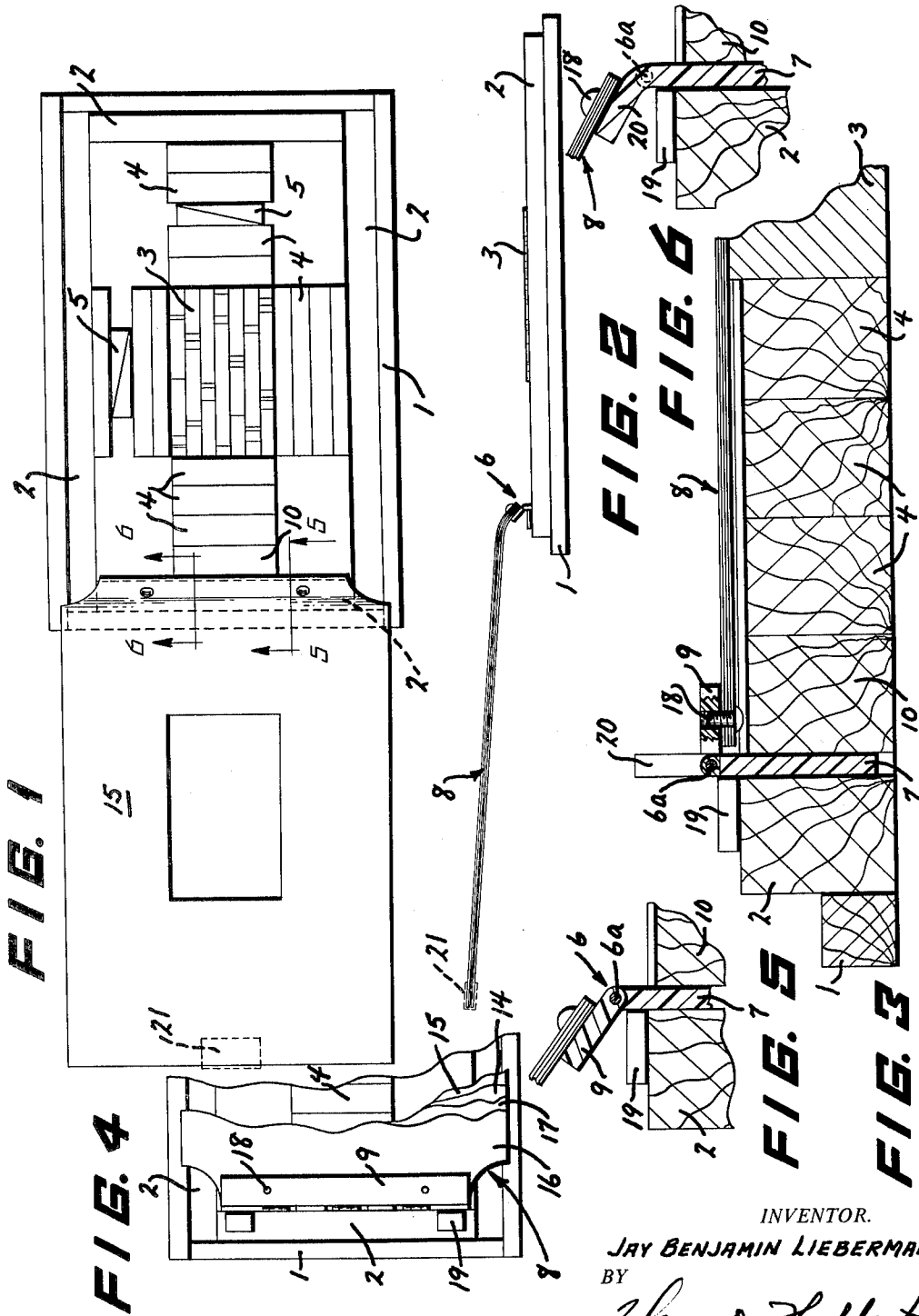


FIG. 1

FIG. 4

FIG. 2

FIG. 6

FIG. 5

FIG. 3

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1

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**PRINTING PRESSES**

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The invention relates to a printing press which can be converted from an ordinary printing chase (the rectangular metal frame in which the type form is locked up) or from a simple box or frame (wooden, plastic, etc.) serving the same function as the printing chase. It relates further to the specific parts, and the combination and arrangement thereof, whereby the printing chase, box or frame may be converted to a printing press.

This printing press is in the first instance intended to be used with standard lead printing type, cuts, engravings, woodcuts, linoleum blocks, etc., as used in the ordinary letterpress process. However, the use is by no means so limited, since the machine provides essentially a way to keep a printing surface firm and in one position, to deliver the paper stock to it in a uniform way, and to insure that pressure is evenly applied, so that the machine may be adapted to engraving, planographic, embossing and other processes as well.

No claim is made for the originality of some of the separate parts; one of them has been used in printing since its beginning. However, the device which results from their combination and arrangement is unique, as witness the fact that the resultant machine is not yet in use. In view of the need and desirability of such a printing press—so simple and inexpensive that it makes letterpress printing available to all who wish it—surely it would be in use if its principles had been demonstrated earlier.

**OBJECTS OF THE INVENTION**

The invention has for its principal object the making possible of a simple and inexpensive hand printing press which amateurs and others can use for producing true letterpress printing.

Another object of the invention is to provide a printing press which is so simple and inexpensive—and so portable—yet employing all the standard elements of letterpress reproduction (i.e., type, cuts, etc.), that it can be carried to meetings by Boy Scouts and other groups, and can be used in hotel rooms or temporary offices by traveling salesmen and other travelers.

Another object of the invention is to provide a letterpress printing press which is fully capable of quality printing and yet which is small and lightweight enough to be stored away when not in use, as in a drawer in a chest in one's home.

Another object of the invention is to provide a letterpress printing press which is so simple and inexpensive that it can be used on an individual and even expendable basis in the educational process, not only to teach printing itself but to teach literacy, spelling, remedial reading, commercial art, graphic arts, and other subjects in which printing has or may be found a useful tool and reinforcement.

Another object of the invention is to provide a simple and inexpensive press, capable of being made locally, to serve as the basis for a rudimentary commercial printing operation in an underdeveloped area where standard equipment is not feasible.

Another object of the invention is to provide a simple and quick device whereby users of large graphic art equipment—in letterpress, planography, engraving, embossing, die-cutting, etc.—can lock in a small form and handle small paper stock, by employing this machine in the chase or on the bed of the larger equipment.

2

Another object of the invention is to provide a simple and inexpensive proof press which delivers the proofing paper in a uniform way, for use by printers and particularly for use by organizations not maintaining normal print shops, e.g., as book publishers might want to pull proofs of printing plates in their possession.

Another object of the invention is to provide a set of parts whereby the owner of a printing chase or substitute frame or box can convert it into a printing press.

Another object of this invention is to provide a set of parts with adaptor sides of various heights, among the other items included, so that the owner of a printing chase or substitute frame or box can convert it variously into a printing press, engraving plate holder, die holder, etc., at his will.

**NATURE OF THE INVENTION**

The above objects are accomplished by providing primarily a printing press which embodies all the necessary elements of hand printing by letterpress, yet avoids the usual heavy, bulky and expensive parts hitherto considered necessary to achieve printing. While no claim is made that this—being a hand press—is a proper press for quantity production of printed matter in a high technology society, it is nevertheless suitable for the usual limited quantities needed in personal use (for Christmas cards, invitations, report covers, etc.) and for proofing purposes, where only a few copies of one particular printing form are required. In underdeveloped areas, where no printing equipment is available and surplus labor is eager for work, this press can economically serve as the beginning press for a commercial printing business.

A feature of the invention is its utilization of existing standard printing parts—i.e., the printing chase, furniture and quoins—with the addition of a minimum of special parts which comprise the heart of the invention, so that the construction of the press is readily and simply accomplished within the framework of existing letterpress technology.

Another feature of the invention is that these additional special parts can be manufactured and marketed separately, or as a set or kit, so that they can be purchased by the owner of a printing chase and so that he can thereupon make the printing press.

Another feature of the invention is it provides the conversion of an ordinary printing chase into a printing press without any difficulty or even bothersome use of tools, but rather by simply locking the parts together at the same time the printing form itself is locked up.

Another feature of the invention is the convenient arrangement it provides for handling paper stock under hand-printing circumstances, where previous alternatives have either been an awkward tympan-frisket arrangement or simply laying the sheet down on the printing form without positioning and with every chance of slurring.

Another feature of the invention is that it may be used not only for standard letterpress printing but in a variety of other processes as well, including but not limited to embossing, lithography, engraving and die cutting.

Another feature of the invention is that it allows the use of different sources and kinds of pressure for different needs and operations.

Another feature of the invention is that it can easily handle printing surfaces of different heights (separately, of course, not American and Continental type in the same form), simply by changing to adapter sides of the new height.

Another feature is that the press can accommodate a sheet of any size, since the tympan pack is anchored only

at one end and the press has no posts or other encumbrances on the other three sides.

Another feature is that the press can be made in a very small size (even a 3 x 5 inch chase or smaller) and still retain the advantages of the mechanism and amount of printing pressure of larger sizes.

Other features and advantages of the invention will be apparent from the specification and claims when considered in connection with the accompanying drawings.

#### THE DRAWINGS

In the accompanying drawings, like numerals are employed to designate like parts throughout. Note that various parts of the drawings are not necessarily to the same scale.

In the accompanying drawings:

FIG. 1 is a top plan view of a press assembly, including the tympan pack, in accordance with the teachings of the instant invention;

FIG. 2 is a view in side elevation of the press assembly of FIG. 1;

FIG. 3 is a view in vertical section, partly fragmentary, showing certain assembly features of the present invention, including the tympan hinge;

FIG. 4 is a fragmentary top plan view of the tympan hinge, where the latter is in the position of FIG. 3;

FIG. 5 is a view in vertical section, taken at line 5—5 of FIG. 1 and looking in the direction of the arrows, showing certain details of the tympan hinge and tympan pack assembly; and,

FIG. 6 is a view in vertical section, taken at line 6—6 of FIG. 1 and looking in the direction of the arrows, showing still further details of the tympan hinge and tympan pack assembly.

#### DETAILED DESCRIPTION OF THE INVENTION

While the methods and apparatus of this invention apply broadly to any graphics process in which one element is held firmly in relation to another element which must be brought against it, their application to letterpress printing will be explained for illustrative purposes, but this is not to be considered limiting. The invention is specifically designed to have such adaptability that it can be coupled with any graphics process.

As already noted, the invention is fully compatible with existing standard printing parts, such as the printing chase, furniture and quoins, and it employs accepted processes of printing, such as hand-inking, handling of paper by tympan and frisket, application of pressure by cylinder or platen, etc. However the invention includes several unique parts which, for convenience, have been given names which will be used throughout the specifications and claims. They are defined and described as follows, with the indicated numbers corresponding to the indicators on the accompanying drawings:

*Adaptor sides 2.*—As shown in FIG. 1, these are a set of generally four lengths of wood, plastic, etc., or pieces of angle iron, bars of iron, etc., which are the height of the type used (American and English type being .918 inch) or which may be even  $\frac{1}{16}$  of an inch or more higher than "type high," as explained below. They should properly be of uniform height throughout their length, and they should be sturdy enough to retain their height upon the application of printing pressure.

*Tympan pack 8.*—As shown in all of the figures and in more detail in FIGS. 1, 2 and 4, this is a set of sheets of paper, acetate, cloth, leather or other equivalent material. At a minimum, two sheets are required, a tympan sheet 14, generally of cardboard or other stiff material, on which the printing stock is positioned by means of standard gauge pins or equivalent, and the frisket sheet 15, normally a sheet of 20 or 24 pound bond paper, into which a window is cut so the type can poke through and print upon the paper stock, while the frisket itself holds the paper secure and protects it from ink smudging off

the furniture and perhaps adaptor sides. Ideally, the tympan pack includes also a cover or impression sheet 16, which is also ideally but not necessarily thicker or tougher than the other sheets, and one or more additional sheets, generally of paper, called the make-ready sheets 17. The sheets are approximately the size needed to cover the printing chase; more exact specifications are given below. The whole pack is fastened together at one end, as will also be explained below.

*Tympan hinge 6.*—As shown in FIGS. 3, 4, 5 and 6, this is a device of thin metal or plastic which has a hinge defined by hinge pin 6a at the center; which has a tympan tail 7 on one side of the hinge, to fit between two surfaces and be held securely by side pressure; and which has a tympan pack holder 9 on the other side, consisting of a means (a pair of set screws 18 as shown below, or clamps or other means) to hold the one end of the tympan pack fastened together. A more sophisticated tympan hinge also includes a lip 19, to control the depth to which the tympan tail is set down between the two locking surfaces, and a ledge 20 to hold the tympan pack at a certain level or angle for the insertion and removal of printing stock from the tympan sheet.

*Tympan block 10.*—As shown in FIGS. 1 and 3, this is a piece of material, generally the same as an adaptor side, which is sometimes used as one of the locking surfaces for the tympan hinge, and which is always required if a tympan pack is used (as in a simple proofing operation) without the tympan hinge.

In addition, printing pressure, as used in the specification and claim, refers to the means by which adequate pressure is applied to the cover of the tympan pack 8 to do the printing. One simple, readily available means, for example is an ordinary kitchen rolling pin. Inasmuch as a cylinder requires pressure only at the thin line of contact, the required pressure for printing is easily achieved by even a child, at least for the small printing forms generally involved. An alternative version of this cylinder is a dowel of perhaps an inch diameter, preferably covered with a layer of rubber or other material to create a slight cushion and, more importantly, to prevent slipping. A stick, somewhat longer than the printing press being used, is pressed down onto the dowel, and moved along with it across the tympan pack. As described below, in certain applications, the invention can be incorporated into a larger and more powerful printing press, to receive the pressure by the means normal to that particular press, be it cylinder, power-driven platen, screw or toggle hand press, engraving press, etc. The optimum chase size depends upon the use intended and the printing pressure available. With a rolling pin, an 8 inch or even 10 inch width is feasible and the length can, of course, be theoretically infinite, since the rolling pin can be rolled an indefinite distance.

The parts of the invention have been defined briefly above, but more detailed specifications are given below, along with a description of the function and arrangement of the parts, and the method of operation of the invention.

As FIG. 1 shows, the invention follows the standard use off a type form 3 locked into place with furniture 4 and quoins 5. However, a set of four adaptor sides 2 are put into place around the inside sides of the printing chase, before the form is blocked in with furniture. While four is the ideal number of adaptor sides, one can be omitted at the end where the tympan hinge 6 on tympan block 10 locks in the tympan pack 8 in such instances as the tympan hinge's lip 19 does not need to function, and at the opposite end (although the adaptor side there helps to keep the tympan pack 8 from sagging onto the printing form). These adaptor sides 2, then, are locked into place when the form is locked up with the quoins. At the same time, as shown in FIG. 3, the tail 7 of the tympan hinge 6 has been slipped into its place between an adaptor

side 2 and the tympan block 10, when used, or the outside piece of furniture 4. It, too, is locked into place when the form is locked up with the quoins, one hand holding down the lip 19 (see FIG. 5) of the tympan hinge while the other hand tightens the quoin. It is this simple method of adapting a printing chase to the printing press, by locking in the component parts at the same time the form is locked up, which is a feature of this invention. It should be noted that adaptors of different heights can be provided for different needs.

The tympan pack 8 consists of sheets which are ideally but not necessarily of uniform size; ideally that size is such that when the hinge 6 of the tympan pack is locked in place and the tympan pack 8 folded over the type form, it will reach to the outside edge of the long sides and about one inch past the edge of the short side opposite the side where the tympan pack 8 is fastened. The tympan pack 8 can be affixed to the tympan hinge 6 either before or after it is locked in, by means of punched holes on the sheets of the pack fitting over set screws 18 or by a clamping arrangement. While the opposite arrangement is possible, these set screws ideally point upward, as in FIG. 5, when the tympan pack is laid open, as in FIGURE 2, so that they will go down into the chase when the tympan pack is folded over, or closed. This leaves the top of the tympan pack smooth and unobstructed when closed, so that whatever means of pressure used will not harm or be harmed by the screws. It will be seen also from FIG. 3 that in the ideal tympan hinge the two parts are of different lengths. The tail 7 is as wide as possible to fit within the space between the two adaptor sides as snugly as possible, so that the tympan hinge can be removed if necessary and restored to exactly the same position, as for instance when the printing form for one color is being removed and another color form inserted, so that exact register can be maintained. The tympan pack holder 9 is ideally cut shorter so that it will easily fit between the adaptor sides when the tympan pack is closed. In conjunction with the lip 19, which is pushed down until it rests on the top of the adaptor side 2, the height of the hinge is so set that the frisket sheet 15 of the tympan pack will fall precisely flat along the length of the adaptor sides 2 when the tympan pack is closed (folded down over the type form and chase). The adaptor sides 2, it will be noted, thus serve the function normal to the frame in the traditional tympan and frisket, and thus make a frame unnecessary for the tympan and frisket arrangement of this invention. It should be noted that for rough proofing and certain other jobs, the niceties of the shortened tympan pack holder and the precise leveling are not necessary to obtain a useful product. The tympan hinge also has a ledge 20, capable of being bent to any desired angle, so that the tympan pack 8 will stop against it in the open position, as in FIG. 6, where the ledge 20 is shown exaggerated. While it does not really matter if the top sheets of the tympan pack fall, so that only the stiff tympan sheet remains at the desired angle, it is more convenient and a simple enough matter (after completion of make-ready) to apply cellophane or masking tape 21 to the open end of the tympan pack, as shown in exaggerated fashion in FIG. 2, to hold the cover sheet 16, make-ready sheets 17 and tympan sheet 14 together, leaving the frisket sheet 15 folded up away from the tympan sheet.

To one who understands the art of hand printing with a tympan and frisket, the method of using this invention in its primary function will be clear, once the printing press is assembled by the locking in of the adaptor sides 2 and the tympan pack 8. With the tympan pack 8 open, the printing form 3 is inked with a hand inking roller or brayer. Then the tympan pack 8 is closed, i.e., folded over onto the printing form 3. The pressure is then applied, by means of a rolling pin or otherwise. The result will be a printed impression on the face of the frisket sheet 15. This impression is cut away, with

perhaps  $\frac{1}{8}$  inch more of the frisket cut away as margin for clearance when the type pokes through later. Now the form is inked again, and a sheet of paper stock is inserted between the tympan sheet 14 and the frisket sheet 15, while the tympan pack 8 is held at a slight angle in an open position, by means of the ledge 20, as shown in FIGS. 2 and 6. When the tympan pack 8 is closed again, and pressure is applied, the type will, of course, poke through the frisket window and print on the paper stock.

Obviously, there are many refinements involved to obtain the quality printing desired, and these are made possible by the tympan pack. Gauge pins can be placed on the tympan sheet 14 so that the paper stock can be held in exact position; when the tympan pack is closed, the frisket sheet 15 serves to hold the paper stock fast. (It also, of course, serves to shield the clean paper stock from any smudges of ink which otherwise might be picked up from the furniture or adaptor sides.) Because the tympan pack 8 is an inch or so longer than the outside of the printing press at the open end, all the sheets of the tympan pack can be held firmly together with the fingers until the pack is laid closed. The amount of pressure which a particular form requires can be met by increasing or decreasing "packing" in the tympan pack. That is, additional sheets of paper can be inserted (preferably pasted) between the cover sheet 16 and a make-ready sheet 17, until the proper pressure is achieved. In the same way, spot make-ready can be done on the make-ready sheets 17 until high quality impression is achieved. (Care must be taken that the packing or make-ready spots remain within the inside space between the adaptor sides 2, since they do not contribute to the pressure if they are atop an adaptor side.)

In short, this press, which I am calling the "Liberty" press, will do standard high-quality printing.

Depending in part on how much packing is desired, the adaptor sides 2 can be made higher than type high, perhaps even  $\frac{1}{16}$  or an inch more under certain circumstances. The advantage of the higher adaptor sides 2 is that the tympan pack 8 will not touch the printing form 3 until it is pressed down, and thus avoid any chance of a slur; obviously, however, the pushing down creates its own stresses on the tympan pack 8 and care must be taken to avoid too much stretching, which will itself create a slur. However,  $\frac{1}{16}$  of an inch normally provides both protection and high quality printing. The lip 19 of the tympan hinge 6 is set to achieve the optimum position.

It should be noted that the tympan pack and hinge arrangement can be of different levels of sophistication—without the lip, for instance, or ledge—and that in fact the tympan hinge can even be eliminated. At the simplest level, a tympan block 10 (of the same height as the adaptor sides, and generally but not necessarily simply a block of wood) is placed next to one of the adaptor sides 2, and the tympan pack 8 itself is slipped between the adaptor side 2 and the tympan block, and then folded over onto the printing surface. In this version, the tympan sheet within the tympan block cannot be stiff, since the tympan pack must be folded and serve as its own hinge, but this is quite satisfactory for proofing and other comparable printing operations. In this instance the "tail" end of the tympan pack is cut in to fit within the chase or box. At the opposite end of sophistication, to insure absolute precision in the placement and replacement of the tympan hinge each time, a matching set of ridges, or holes and protrusion, can be put in the tympan tail 7 and in the appropriate side of the printing chase 1 or substitute frame or box.

Furthermore, the tympan pack is not to be understood merely to be of the kind previously described, to handle paper stock in conjunction with a printing form as such. A female engraving or embossing die may be attached behind the tympan sheet, for instance, to provide a means whereby the paper stock may be brought between the

female die and the male die, which constitutes the graphic-art form locked in the chase, frame or box. Similarly, a die-cutting sheet may be attached behind the tympan sheet, to provide a means whereby the paper stock may be brought between the sheet and a cutting die, which constitutes the graphic-art form locked in the chase, frame or box. The lip 19 of the tympan hinge 6 is here seen as particularly important in providing flexibility, since it sets the tympan pack at the proper height, no matter what variable is involved.

These examples are offered as merely illustrative of the flexibility of the device to meet various graphic-arts needs, all this being made possible by the fact that the device can be subjected to the whole range or available pressures needed for the different processes, e.g., the device can be put in an engraver's press, on a platen die-cutting press, etc. (Since the dies, engraving plates, etc., which may be locked into the printing chase are not strictly speaking "printing forms," the rest of this description and the claims will refer to "graphic-art forms" as a means of encompassing the whole range of possible elements which may be utilized in the device. In the same sense, while "printing press" is used to convey the description of the device in its primary use, it should be understood that the device is applicable to many processes other than printing.)

It should also be noted that instead of the printing chase 1, a substitute frame of wood, plastic, or even other materials can be used, as can a box made of wood, plastic, etc. (Fragile frames or boxes can be used with wooden wedges instead of quoins for locking in forms, to avoid bursting the corners.) If these substitutes are used, they can be made with sides of the proper height, so that separate adaptor sides are not needed. In the case of these substitutes, or even a printing chase made specifically for the purpose, by making one side type high, approximately or exactly, the tympan hinge arrangement can be made a permanent part of one side, i.e., a hinge with the tympan pack holder side can be built onto a wall of the frame or box, and a ledge protruded. The principle of the separate tympan hinge which locks in must be maintained, i.e., a firm, precise and repeatable holding of the tympan pack to insure proper register.

In this connection, it may seem that an attached hinge for a tympan and frisket is indeed the oldest method of handling paper stock on a press; yet there at least are two differences here which should be noted. The first is that this is a different kind of tympan-frisket arrangement, a pack fastened securely at one end, and without a frame, versus the separate tympan and frisket frames of the traditional hand press. The second difference is that the traditional tympan-frisket arrangement inevitably involved and required the other parts of the press to be built in and attached, including the parts for delivering one kind of pressure, all of which involved bulk and weight. It is one of the features of the present invention that it does not limit itself to one means of applying printing pressure but can, because of its compactness and portability, as well as its flexibility, be used in conjunction with a variety of means of applying pressure. Two of the means have been described above—the rolling pin and the dowel and stick. These may properly be considered adjuncts of the invention, if desired. However, with this invention it is also possible to take advantage of much greater types of pressure, if available.

Thus, for instance, the completely portable printing chase 1, together with its locked in graphic-art form, adaptor sides, tympan hinge, and attached tympan pack, can be placed on a bed of a so-called "office press," to take advantage of the great pressure delivered by the screw-type platen thereof and still provide exact-register handling of paper stock in a way not otherwise possible with the office press. In the same way, if a small card is to be printed on a huge antique hand-press (of a screw or toggle variety), the large tympan and frisket frames

can be removed, and this small device placed in the center of the bed. Use of the tympan pack to handle the paper stock will eliminate the awkward operation of the bulky large tympan and frisket, and the inking and printing can proceed as usual. An even more important use of this kind, perhaps, is in the way an ordinary proof press can be converted by this device to provide the handling of paper without slurring (which results otherwise from laying the proof sheet by hand on the type, as is required by the simple proof presses), and even position the paper accurately (which, again, cannot be done on an ordinary proof press). In the same way, the device can be used in an engraving press or lithographic press. Note that in none of these different kinds of operation is there need even to lock the device into position on the bed. The whole device is simply laid onto the bed, being locked internally.

However, because one feature of this invention is that it is compact and essentially type high, the device (once locked up within itself to include graphic-art form, adaptor sides, tympan hinge, and tympan pack) can be locked up in the chase of a large press, and the pressure of the large press used to achieve the impression. This is particularly useful in embossing and die-cutting.

The various arrangements of the invention noted here, and the number of different uses, by no means exhaust the possibilities. From the foregoing, however, it will be seen that the present invention provides a novel press which is extremely simple and flexible to make and operate, which is highly portable in that it is lightweight and compact, and which does in fact comprise a unique new device to achieve printing and other related processes at various useful levels which are not now served by portable, inexpensive, highly flexible and easy-to-operate presses.

Variations and modifications may be made within the scope of the claims, and portions of the constituent elements of the press may be used without others.

I claim:

1. A work sheet holding arrangement adapted for securement in a type chase having removable type and furniture means for securing said type therein comprising:

a tympan hinge consisting of a substantially rigid tail member, a substantially rigid ledge member hingedly connected to one edge of said tail member, rigid lip means perpendicularly fixed to said edge of said tail member so that said tail member can be inserted in said type chase and said lip means forms a stop by abutting against said furniture means so as to properly vertically position said tail member,

a substantially rigid pack holder consisting of a rectangular pack holder attached to said hingedly affixed ledge member,

a pack of rectangular sheets arranged in aligned stacked relation and attached along one edge thereof to said pack holder, said pack of sheets consisting of an impression sheet having one side thereof adjacent said pack holder, a make-ready sheet adjacent the other side of said impression sheet, a tympan sheet having one side adjacent the other side of said make-ready sheet and adapted to removably hold a work sheet to be printed, and a frisket sheet having an opening therein having one side adjacent to the other said of said tympan sheet, all of said sheets being pivotable about said tail member from a raised position to a flat position over said type chase wherein the opening of said frisket sheet is aligned with the type so that an application of pressure upon the side of the impression sheet adjacent to the pack holder will make an imprint from said type upon a work sheet held on said tympan sheet.

2. The device of claim 1 wherein plural make-ready sheets are located in the recited position of the singular make-ready sheet.

(References on following page)

## 9

## References Cited by the Examiner

## UNITED STATES PATENTS

4,838	11/1846	McKinzie	101—421
17,405	5/1857	Learned	101—421
142,648	9/1873	Peterson	101—421
192,256	6/1877	Harp	101—421
786,020	3/1905	Folger	101—391
1,221,111	4/1917	Traub	282—22
1,924,288	8/1933	Reardon	101—408 X
1,926,983	9/1933	Lamb	101—250 X

## 10

1,964,236	6/1934	Welch	101—391 X
1,985,551	12/1934	Reardon	101—391
1,997,191	4/1935	Hoag	101—250
2,797,641	7/1957	Marshall	101—421
3,056,347	10/1962	Dashew et al.	101—408 X
3,125,951	3/1964	Lyman et al.	101—45 X

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