June 24, 1941. A. A. DANIELS 2,246,795

METHOD OF MOUNTING PRINTING PLATES

Filed April 17, 1939

Fig. 1

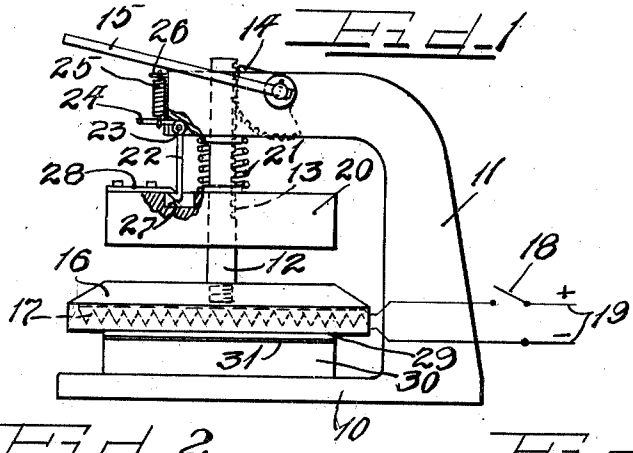


Fig. 2

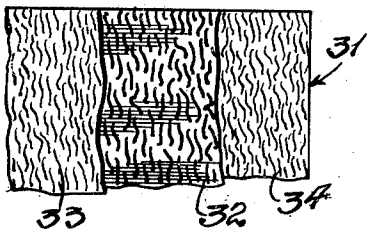


Fig. 3

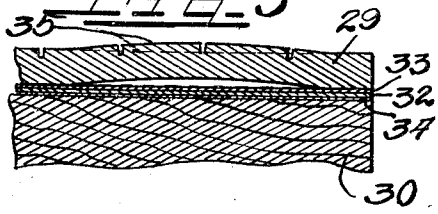


Fig. 4

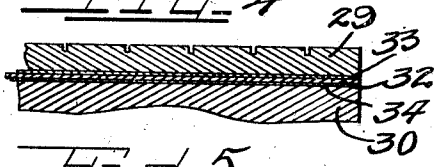


Fig. 6

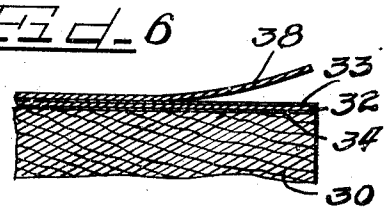


Fig. 5

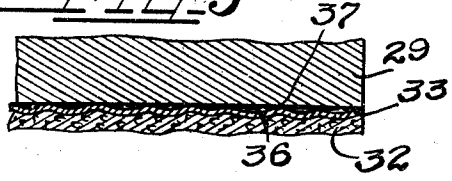
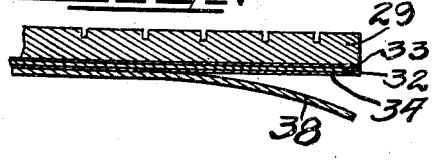


Fig. 7



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METHOD OF MOUNTING PRINTING PLATES

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3 Claims. (Cl. 154—2)

The present invention relates in general to printing plates and is particularly concerned with improved means and method of utilizing the same for securing or mounting the plate on a base or backing support.

Heretofore two principal arrangements or methods have been utilized for the securing of printing plates of zinc, copper or other suitable material to a base or backing support.

In the first method, which is the one most generally used, the printing plate is provided with a peripheral flange through which tacks or small nails are driven at spaced intervals to secure the plate around its periphery to a base or backing block. It will be appreciated that in order that the plates may be secured in this manner, the base block must of necessity be of wood or some similar material into which the nails may be driven.

While this method in itself involves a comparatively simple nailing or tacking operation, it requires a comparatively high degree of skill in order to secure the plates properly, and regardless of the degree of care that may be exercised by the worker, there is the ever present danger of accidentally damaging the plate as a result of a misdirected blow of the hammer, the bending of the tacks, or from other causes which may inadvertently arise.

Since this method requires the use of a wooden base or backing block, it has the disadvantage that the base is subject to atmospheric changes, the block taking up moisture, warping, drying out and the like, which may cause loosening of the nails, change the effective height of the printing surface of the plate and generally render it unsuitable for proper use. Such undesirable changes must be corrected before the plate can again be used for printing purposes.

It frequently happens that after such plates have been used, it is desired to remove them from their base block without damaging them. It will be apparent that tacked plates are not adapted to be readily removed, and in removing them a high degree of care must be exercised in order to avoid damage to the plate.

With a view to overcoming some of the objections and disadvantages attending the use of the first method, a second arrangement or method has been suggested in which the printing plates have been provided with a peripherally extending beveled edge for engagement by spaced clamping members of suitable construction which could be tightened to secure the plate at its periphery to a base block. The base block in this case could therefore be made of some suitable metal instead of wood, thus eliminating the inherent disadvantages resulting from the use of wooden base blocks and their changes under varying atmospheric conditions. While the second method possesses some advantages over the first method, it has not come into extensive use due to its high cost.

Neither of the two methods described above accomplish all the most desirable and advantageous results which might be desired in an arrangement for most efficiently securing printing plates to base blocks. For example, the printing plates utilized in both of the foregoing methods require peripheral marginal areas either to permit tacking or for clamping the plate to the base block. These areas cannot be utilized as printing surfaces and therefore constitute waste areas in this respect, and increased plate cost. Likewise, the size of the base block must also be increased to accommodate the plates with the waste marginal areas. Since the plates are secured at spaced points, the plates after being mounted are not adapted for the performance of other operations thereon, such as sawing, grouting, and the like. These operations subject the plate to forces which tend to loosen and cause shifting which must be corrected before the plate may be used. Moreover, these operations may leave unsecured edges or produce thin areas in the plate which enable shifting of plate portions in a direction normal to the base block.

Having in mind the foregoing disadvantages and objections to the methods and means described above for securing printing plates to base blocks, the present invention has for an object the provision of improved means and method for said purpose which will permit the use of base blocks of wood, metal or other suitable materials, which is simple in operation, which is inexpensive, and which may be practiced and utilized by unskilled labor.

A further object of the invention is to provide novel means for securing printing plates to base blocks, wherein the block may be secured throughout its entire back surface, thus preventing warping, buckling or raising of the plate, and permitting sawing, grouting and other operations on the plate after it has been mounted.

A further object is to provide novel means for securing printing plates to base blocks, said means being of such a nature as to enable the plate to be readily removed from the mounting block, when desired, without the danger of damaging the plate.

It is a still further object of the herein described invention to provide securing means for printing plates which may be utilized to effect the securement of the plate to the base block in a relatively short period of time, and by unskilled labor.

Still another object is to provide an improved method for securing printing plates to base blocks, and novel means for practicing the method, whereby savings may be effected in the block and plate materials, and which will enable utilizing the full area of the plate for printing purposes.

Another object is to provide as new articles of manufacture, plates and mounting blocks which may be furnished to the trade with the securing medium affixed thereto.

Another and further object is to provide means for mounting printing plates, which will during the mounting operation effect a straightening out or leveling of a plate which may be warped, buckled or contain raised portions.

Yet another object of the herein described invention is to provide improved apparatus for practicing the steps of my improved method of mounting and demounting plates on base blocks of any material.

From the foregoing, it may be deduced that these objects and advantages might be attained, if a suitable bonding agent having proper characteristics could be found.

Glues such as gelatine and many other adhesives have been tried for such purpose, but due to their inability to quickly dry between closely fitting surfaces, as well as for other reasons, a weak joint, which does not hold the plate onto the base block with sufficient tenacity, results.

I have discovered that such difficulties may be overcome and a suitable bond secured between the plate and base block by the use of a bonding material which will flow or is activated when subjected to pressure, and of such a nature as to have a high coefficient of friction relative to the plate and base block surfaces.

For such purpose, I have found that very desirable and satisfactory results can be secured by using a tape composed of a backing which is creped, toweled or otherwise formed to enable stretching and lessen contact over its entire surface, this backing being coated on opposite sides with a non-drying adhesive such as rubber and a resinous material. Such a tape is energizable by application of pressure and is capable of retaining its adhesive character under the most adverse atmospheric conditions.

A tape having these characteristics is available and is commercially known as "Scotch" tape. Although Scotch tape is primarily designed to present lessened areas of contact so that it may be easily removed, it has been found that when approximately 10 to 15 pounds initial pressure per square inch is applied, the adhesive coating will flow to initially bond the printing plate and base, and that if an impact or hammer blow pressure is then applied, this pressure being approximately twice the initial pressure, then the coating will be entirely activated and be pressed into intimate engagement with the plate and base surfaces and bond them against removal in directions normal to the surfaces. The additional hammer blow has the added advantage of straightening out or leveling any warped or buckled portions of the plate so that the printing surface will lie throughout its area in the same plane.

By bonding the plate and base in this manner, sliding movement is prevented of the plate surface over the base surface due to the fact that the adhesive coatings on the tape backing offer a high coefficient of resistance relative to the plate and base surfaces. Moreover, since a tape backing is utilized the friction opposing relative sliding movement of the base and plate takes place between four different surfaces, namely, the plate surface, the adjacent surface of the fiber backing, the base block surface and the adjacent surface of the fiber backing. These high frictional forces readily prevent sliding movement of the plate and base block.

For removing the plate from the base block mounting, it is only necessary to heat the assembly to an approximate temperature of 250° F., such heating being sufficient to cause liquefaction of the adhesive coatings of the tape and enable the plate to be readily removed from the mounting base. The printing plate and base can then be cleaned with gasoline, benzene or kerosene or other suitable solvent.

By "printing plate" as used herein is meant any material having a printing surface and includes electrotypes, half tones, zinc etching, nickel types, stereotype plates, Ludlow, Intertype, Linotype, slug heads, all types of shell-cast printing surfaces, rubber printing plates, and linoleum printing surfaces.

Other objects and features of the invention will more fully appear from the following detailed description, taken in connection with the accompanying drawing, which illustrates a preferred embodiment of the invention, and in which:

Figure 1 is a view in elevation of apparatus for use in mounting and demounting printing plates on a base block according to the method of the herein described invention;

Figure 2 is a fragmentary plan view of the bonding material utilized in the herein described invention, portions being cut away to show the backing and adhesive coatings of the tape;

Figure 3 is an enlarged fragmentary sectional view illustrating the manner in which a warped or bulged printing plate may be leveled, when utilizing the present invention;

Figure 4 is an enlarged fragmentary sectional view showing the printing plate secured to a metal base;

Figure 5 is an enlarged fragmentary sectional view showing the relationship of the surface of the securing tape to an adjacently disposed surface, before the application of pressure thereto;

Figure 6 is an enlarged fragmentary sectional view illustrating the manner in which the tape may be applied to a base block to form a fabricated article of manufacture; and

Figure 7 is a similar view showing the tape applied to the printing plate.

As shown on the drawing:

Referring to Figure 1, there is illustrated apparatus for practicing the steps of my improved method for securing a printing plate to a base structure.

More specifically, the apparatus comprises a base 10 which forms a lower presser plate and has extending upwardly therefrom a pedestal support 11 which is deflected at its uppermost end over and above the base 10.

The pedestal at its upper end is arranged to

form a bearing support for a vertically reciprocable shaft 12 having formed throughout its length a rack 13. This rack engages with a sector-shaped gear 14 which is swingably mounted on the pedestal and associated with an operating handle 15 by means of which the gear may be operated to cause up and down movement of the shaft 12.

The lowermost end of the shaft 12 is suitably secured to a presser plate 16 which cooperates with the lower presser member 10 for forming cooperative clamping members.

The upper presser plate 16 is internally provided with a heating element 17 which may be connected through a suitable control switch 18 to a source of electric supply 19. By closing the switch 18, the upper presser plate may be heated to raise its temperature, for a purpose which will later be explained.

Slidably mounted for vertical movement on the shaft 12 is a weight member which is normally actuated in a downward direction by means of a coil spring 21 having one of its ends bearing against the weight member 20 and its other end bearing against the associated portion of the supporting pedestal for the shaft 12.

It will be noted that the weight 20 is supported for movement independently of the upper presser plate, and is normally held in raised position by means of a latching finger 22 which is pivotally mounted, as shown at 23, on the pedestal for swinging movement. At its pivot, the finger 22 is provided with an angularly disposed arm 24, this arm being connected to one end of a spring 25 having its other end anchored, as shown at 26, to the pedestal. This spring applies a biasing force to the latching finger which normally tends to swing it in a clockwise direction. The lowermost end of the latching finger 22 is arranged to extend into a recess 27 in the upper surface of the weight member 20, and engage with a latching plate 28 to retain the weight member in raised position. The weight member 20 may be raised to latched position by actuating the handle 15 upwardly or in a clockwise direction.

When the presser plate 16 has been actuated towards the presser plate 10 to apply pressure to an object placed therebetween, a hammer or impact blow may be imparted to the object merely by depressing the arm 24 which acts to release the latching finger 22 and allow the weight to be impelled downwardly by the spring 21.

The apparatus just described is particularly adapted for securing printing plates such as shown at 29 in Figure 1 to a base block 30 by means of a bonding material as generally shown at 31.

The bonding material, as shown in Figure 2, comprises a paper base strip which is preferably absorbent, approaching blotting paper, calendered or uncalendered; preferably, however, being of unsized, uncalendered variety which is pressed, molded or otherwise formed with rugosities or corrugations to have the appearance of toweled fabric, such as by crimping or creping the same.

This paper base is coated on its opposite sides to form layers 33 and 34 with a non-drying adhesive material comprising rubber and a resinous material, the adhesive being energizable by application of pressure and capable of retaining its adhesive character under the most adverse atmospheric conditions.

In this construction, the bonding material becomes impregnated in the fibers of the base paper strip, and due to the creped or crimped surfaces of the strip permits a certain amount of stretching of the adhesive material. Moreover, this creping or crimping of the base paper provides lessened contact surfaces over the entire outer surfaces of the adhesive coatings.

In utilizing this tape, in the present invention, the tape is disposed between a printing plate and a base block, the plate and base block being in superposed relation with the tape sandwiched therebetween with its coated surfaces respectively engaging the adjacent surface of the plate and adjacent surface of the base block.

The assembled plate, block and adhesive strip are then placed in the press previously described with the upper pressing plate 16 engaging the upper surface of the printing plate and with the lower surface of the base block engaging the upper surface of the lower presser plate 10.

In order now to bond the printing plate to the base block, it is only necessary to move the operating lever 15 of the apparatus downwardly to initially apply a pressure of approximately 10 to 15 pounds. This initial pressure causes initial energization of the tape and causes initial flow of the adhesive coating thereon. The bond is then completed by administering an impact or hammer blow by releasing the weight 20 which is moved downwardly to impact engagement with the upper pressing member 16. This hammer blow completes the energization of the adhesive coating of the tape and results in establishing intimate engagement between the coextensive surfaces of the printing plate and base block and the backing paper of the tape to provide an extremely tenacious bonding between the printing plate and its associated base block.

As shown in Figure 3, the impact blow of the weight member 20 has the additional advantage of leveling out bulges or warped portions in the plate as indicated in full lines in Figure 3 at 35, the final position of this portion of the plate being indicated in dotted lines.

The pressure plates of the apparatus are then released and the printing plate with its base block secured thereto may be removed from the press. Attaching of the plates in this manner has proved advantageous, in that it secures the plate to the block throughout its entire area, and it is unnecessary to provide securing flanges or beveled edges on the plate for securing purposes, these edges constituting waste areas which cannot be utilized as printing surfaces.

Due to the intimate engagement of the confronting surfaces of the printing plate and its block support, great adhesive strength is attained in the joint. The adhesive coating on the tape provides a high coefficient of friction between the adjacently disposed surfaces of the printing plate and block, and also between these surfaces and the surfaces of the paper backing material of the tape. Since this friction is acting on a plurality of surfaces, the printing plate is securely held against sliding movement relative to the base mounting.

With this method of securing the printing plate to a base mounting, it is possible to utilize printing plates of different materials and the mounting is not limited to any particular material as mounting blocks of wood, metal or any suitable material may be utilized in this method.

In order to remove the printing plate from the block it is only necessary to insert the as-

sembly in the apparatus and apply a slight initial pressure to bring the upper pressing plate 16 into engagement with the top surface of the printing plate. The switch 18 is then closed or the switch may have previously been closed to heat up the upper pressing plate 16 to substantially 250° F. This temperature if sufficient to cause liquefaction of the adhesive coating of the tape sufficiently to enable removal of the printing plate from its associated base block, when the assembly is removed from the apparatus. The printing plate and base may then be cleaned with any suitable solvent such as gasoline, benzene or kerosene.

As shown in Figure 5, the creped paper backing of the tape defines a plurality of depressions 36 in the adhesive coating, these depressions being separated by small ridges 37 defining lessened contact areas. Upon the application of pressure, the coating material is enabled to flow and make intimate contact with an associated surface without breaking the coating material or tearing the fibers of the paper backing.

As shown in Figures 6 and 7, the use of a tape such as hereinabove described, enables assembly of either the printing plate or the block mounting as a unitary article of manufacture, which may be offered to the trade. Figure 6 shows the tape applied to the base block, and Figure 7 shows the tape as being applied to the printing plate. In either case, the tape is applied with one adhesive surface in engagement with the base block or the plate, the tape being cut to the size of the mounting surface of the printing plate or the block. For protection of the other adhesive surface of the tape, it is preferred to provide a protective strip which may be removed by peeling it off when it is desired to secure a printing plate to the base block, or a base block to a printing plate having the tape previously affixed thereto. Removal of the strip 38 exposes the other surface of the tape so that a printing plate or block may be placed thereon in superposed relation and secured in position by means of the apparatus described above.

From the foregoing description, it will be apparent that the present invention provides an improved method and means for practicing the steps of the method for securing printing plates to base or mounting blocks; which enables the use of printing plates and base blocks of different materials which may be secured together by unskilled labor; which effect securement of the plate and block throughout their associated surface areas and enables sawing, grouting and other operations to be performed on the plate after it is mounted; which during the mounting operation levels out any warping or buckled portions in the plate; which enables the plate to be easily removed from the mounting block when desired without danger of damaging either the plate or the block; which includes novel apparatus for performing the steps of the method; and which provides a new article of manufacture in the form of a printing plate or mounting block which may be furnished to the trade with the securing medium affixed thereto.

Now, it is of course to be understood that although I have described in detail the preferred embodiment of my invention, the invention is not to be thus limited but only in so far as defined by the scope and spirit of the appended claims.

I claim as my invention:

1. The method of mounting a metallic printing plate upon a base block which comprises interposing between the base and plate a fabric sheet coated on its opposite surfaces with a non-drying adhesive activated at ordinary temperature only by substantial pressure, initially gradually applying a relatively light pressure to bring the base and plate toward each other and initially activate the adhesive, and then subjecting the thus assembled block and plate to an impact blow of sufficient force to completely activate the adhesive and smooth out and level any bulges and warped portions that may be contained in the plate.

2. The method of mounting a warped printing plate upon a flat surface of a base block which comprises interposing between the base and plate a fabric sheet coated with a pressure responsive adhesive on its opposite surfaces, gradually applying an initial pressure to bring the base and plate toward each other to initially activate the adhesive and level out the plate, and thereafter, while maintaining the initial pressure, subjecting the thus assembled block and plate to an impact blow sufficient to set the plate material in leveled out position and cause complete activation of the adhesive.

3. The method of mounting a printing plate upon a base block which comprises disposing between the plate and block a sheet coated on both sides with an adhesive flowable at ordinary temperature only under substantial pressure, gradually applying a substantial pressure to the block and plate to bring the same into engagement with the adhesive and initially activate the same, and thereafter subjecting the block and plate assembly to an impact blow to further activate the adhesive and cause it to flow into intimate contact with the adjacent surfaces of the block and plate to connect the block and plate rigidly.

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