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METHOD OF AND APPARATUS FOR PREPARING REGISTERING FORMS

Filed March 23, 1939

2 Sheets-Sheet 1

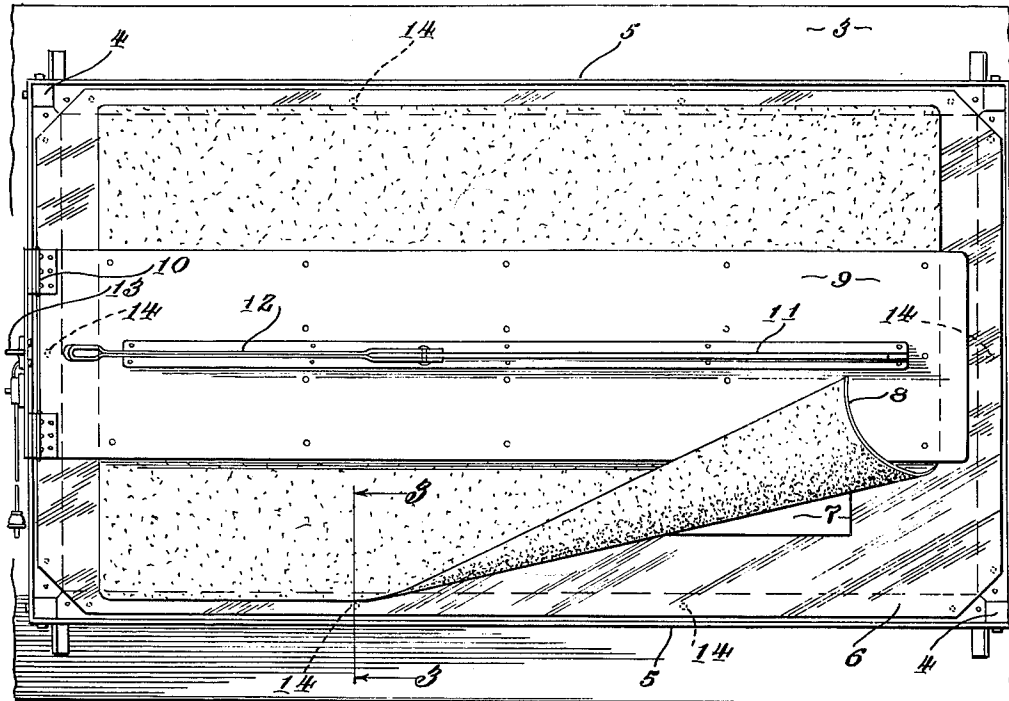
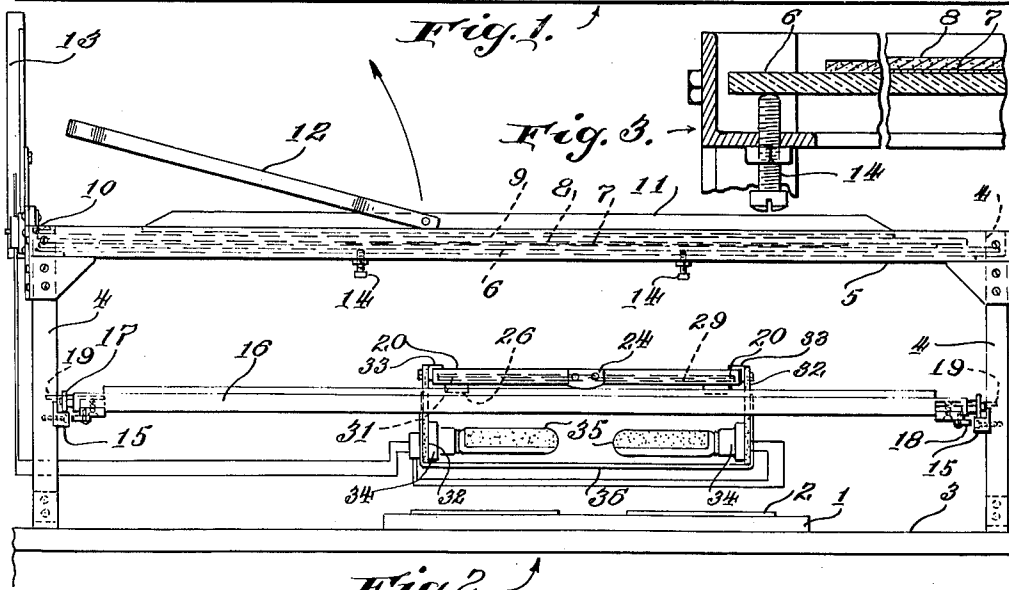


Fig. 2.

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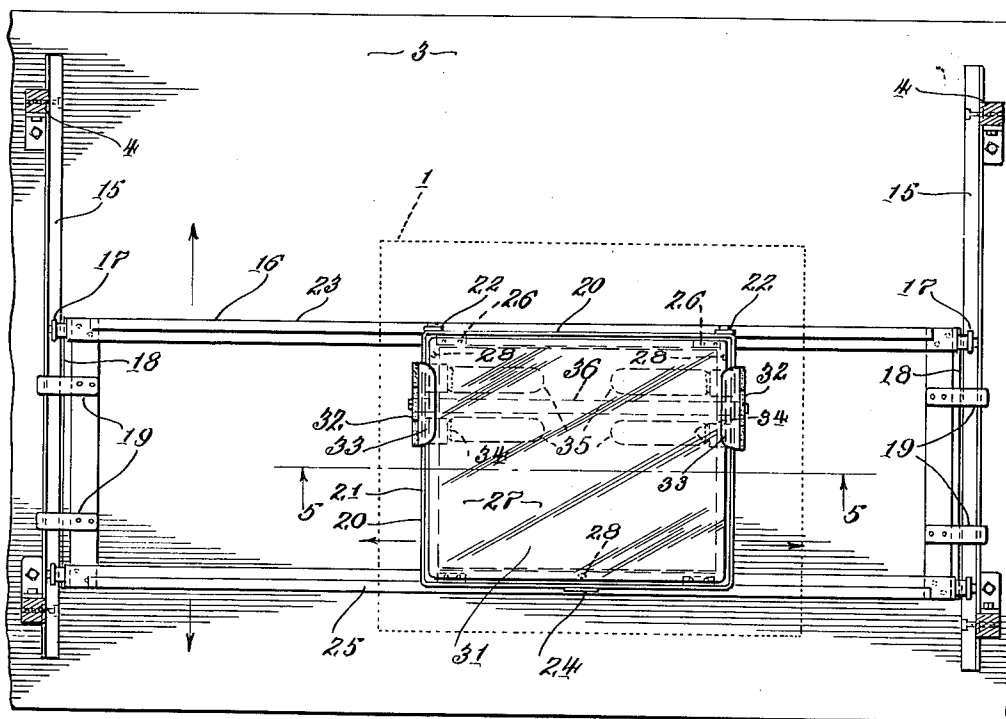
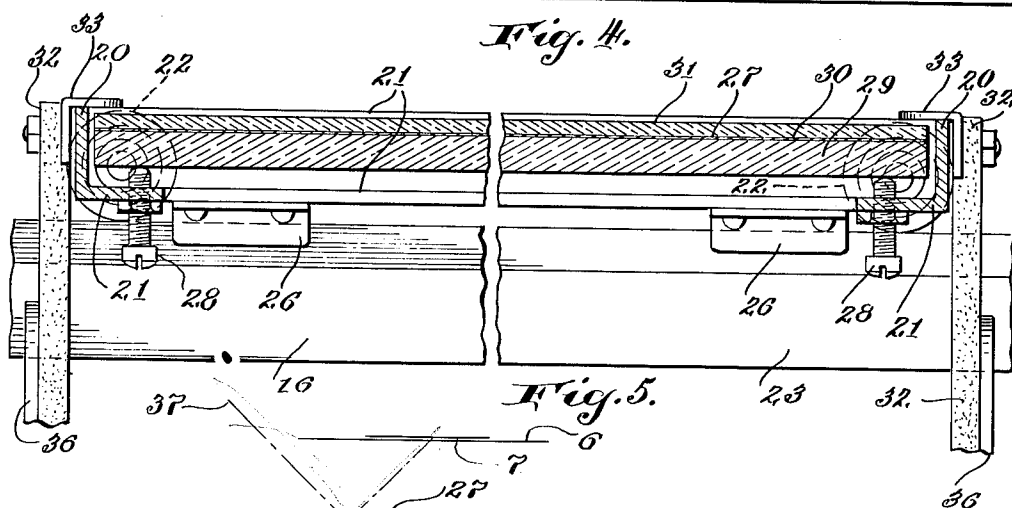


Fig. 6.



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METHOD OF AND APPARATUS FOR PREPARING REGISTERING FORMS

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13 Claims. (Cl. 83—14)

This invention relates to a method and apparatus for use in registering forms and its objects are to develop such a method and apparatus by the use of which the members of an impression form such as are used in printing, embossing, dyeing and creasing, lithographic or similar work, can all be quickly and accurately registered with the preceding impression or make-up detail.

In this invention the plates, cuts, dies, type matter or transfer members, sometimes called movable members, or impression members, are placed in a form which is placed on a table or imposing stone. The primary impression or registering detail may be a sheet printed from an original form and upon which other matter or matter of other colors is to be placed, or it may be a lay out drawing or a sheet on which proofs have been pasted, or any other sheet or apparatus outlining the space or spaces to be occupied by the impression members.

By the method hereinafter described it is possible to prepare in the composing room in the minimum amount of time the forms required for producing any piece of close register work, in which a single sheet is necessarily subjected to a plurality of operations, and obtain substantially correct and perfect register of the different impressions.

Earlier devices to accomplish these same purposes have been comparatively expensive to manufacture and more troublesome in use than the simplified and inexpensive method and apparatus of this invention.

The invention may be carried out in many different ways and it can be embodied in various forms of apparatus other than the one illustrated and except where such details are specifically described and claimed it is not intended to limit the invention to the particular embodiment thereof illustrated. For the purpose of illustration there is shown one form of the apparatus in the drawings, in which:

Figure 1 is a top plan view of an apparatus embodying the present invention.

Figure 2 is a front elevational view thereof.

Figure 3 is a detailed sectional view on line 3—3 of Figure 1.

Figure 4 is a plan view of the apparatus with the registering detail holding plate removed.

Figure 5 is a view partly in section of the transparent reflector mounting on line 5—5 of Figure 4.

Figure 6 is a diagrammatic view illustrating the operation of the invention.

In the drawings similar numerals refer to similar parts throughout the several views.

The form 1 containing various printing members 2 to be registered is placed on a table or imposing stone 3 to which is rigidly attached a frame-work consisting of uprights 4 and a rectangular frame 5 thereon which is opposite and substantially parallel to the table 3. The frame 5 has resting therein glass 6 on which is placed, face down, a sheet of paper 7 having thereon detail with which the movable members in form 1 are to be registered. This registering detail may be a sheet printed from an original form and on which other matter or colored matter is to be placed or it may be a drawing or a sheet on which proofs have been pasted or any other sheet or apparatus outlining the space or spaces to be occupied by the impression members. It is most important that the sheet be held flat, down upon the glass surface, and to effect this result a rubber mat 8 may be placed over it. This rubber mat is affixed to plate 9 hinged at 10 to the frame 5. A reinforcing inverted T-bar 11 is attached to the plate 9 and to this T-bar 11 a loop 12 is pivoted, which may be looped over upright 13 attached to the end of the frame work of the apparatus. When the plate 9 is raised with its rubber mat and the loop placed over the upright 13 the registering detail sheet 7 may be suitably arranged on the glass 6. Glass 6 is placed in the frame work 5 on adjustable screws 14 so that it may be adjusted to an exactly level position over the imposing stone or table 3.

Intermediately between the glass 6 and the imposing stone or table 3 and at the ends of the frame-work are horizontal runways 15 attached to the uprights 4. Back and forth on these runways a carriage 16 runs on rollers 17. The carriage 16 is guided to run in a straight line back and forth by guides 18 thereon which very nearly contact the side runways 15. Fingers 19 project from the carriage 16 into the way of uprights 4 to prevent the carriage from running off the runways.

On carriage 16 is another carriage 20 composed of a frame 21 having rollers 22 on one side thereof riding on runway 23 of carriage 16. On the other side of carriage 20 is a slide 24 which slides on way 25 on carriage 16 thus giving a three point suspension to the carriage 20 in its longitudinal movement over carriage 16. Carriage 20 has vertically extending guides 26 riding between ways 23 and 24 on carriage 16 to keep the carriage 20 on the ways of carriage 16. Transparent reflector 27 is mounted in carriage

20 on three set screws 28 which allow for its accurate adjustment in the frame of carriage 20. The transparent reflector is composed of a sheet of glass 29 having thereon a thin coat of silver 30 and placed thereover is a protecting sheet of glass 31. This structure allows one to see movable members through it and at the same time it reflects the registering details from sheet 7. Mounted on insulating fibre 32 supported on the carriage 20 by right angles 33 are light sockets 34. These sockets have therein four bulbs 35 silvered on one side so that they may be adjusted and the light directed to any desired position by simply turning the bulbs. The lights are movable back and forth over the carriage 20 by sliding the angles 33 thereover to allow for adjustment of the lights to any desired position. The light supports are held together by U-shaped strap 36.

By this construction the transparent reflector 27 may be moved bodily over the form 1 both backward and forward and sidewise. In Figure 6 there is given a diagrammatic sketch of the operation of the device. The observer's eye in approximately position 37 would view the movable members on form 1 through the transparent reflector 27. That transparent reflector would at the same time reflect a view of the registering detail on sheet 7 and if the movable members in the form 1 are in their correct position the image of the reflection and the view through the transparent reflector will coincide. If the movable members are not in the correct position they may be moved around in the form 1 until they are in that coinciding position. The transparent reflector may then be moved to other positions to obtain the complete register of all the movable members in the form with the detail on sheet 7 and then the form may be locked up.

The manner of using and advantages of the invention will be understood from the foregoing description in connection with the drawings. As shown in Figures 2 and 6 it is preferable to have the supports 3 and 6 parallel to the reflector 27 so that the accurate registration may be viewed from any position around the table 3 and it is also preferable to have the reflector 27 midway between the detail 7 and the form 1 so that the distance for the travel of light to the reflector in each case will be the same, which will of course make the image and view the same size.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. The method of determining the correct position in an impression form of a movable member comprising arranging a surface in part transparent and in part reflecting midway between and opposite to the impression form and a representation of an impression form indicating the correct position of the movable member, arranging in register on said surface a true image of a sufficient portion of the representation of the impression form and a true view of the corresponding part of the form and the movable member.

2. The method of registering impression forms having movable members which consists in providing registering detail indicating the correct position of the movable members and a surface in part transparent and in part reflecting midway between and opposite to the detail and members, moving the members so that a virtual image of the detail on the surface coincides with

the true view of the members when the same are in register.

3. The method of registering impression forms having movable members, which consists in providing registering detail indicating the correct position of the members opposite to the form, and a transparent medium midway between the form and detail, viewing an image of the detail on, and the members through, the medium, and adjusting the members until a view of them through the medium coincides with the image of the detail on the medium.

4. The method of registering impression forms having movable members which consists in providing registering detail indicating the correct position of a plurality of members in a form, mounting said detail and the form on opposite parallel supports, and providing midway therebetween a partially transparent medium, viewing an image of the detail on, and the members through, the medium, moving said detail and form until the portion of the form to be registered is in suitable relation to the detail for an image of the detail on the medium to substantially coincide with the view of the members in the form therethrough and moving the member to be registered to the proper place as determined by said image.

5. The method of determining the correct position of a movable member in an impression form comprising arranging a partially transparent medium midway between and parallel to the form and registering detail indicating the correct position of the movable member, throwing on to the medium an image of said detail, viewing said image on, and the member through, the medium and manipulating the movable member until a view thereof through the medium coincides with the image thereon of corresponding parts of the detail.

6. An apparatus for registering forms comprising, in combination, a support for an impression form having movable members, means substantially coextensive with said support to support registering detail for said form opposite thereto, means in part transparent and in part reflecting midway between the form and detail and arranged to reflect an image of said detail, the form support and transparent-reflecting means being positioned in the line of vision of an operator through the latter to the former from the image reflecting side of the transparent-reflecting means, whereby said image and a view of the movable members may be arranged to coincide.

7. An apparatus for registering forms comprising, in combination, a support for an impression form having therein movable members, means substantially coextensive with said support to support registering detail for said form opposite thereto, a transparent and reflecting plate midway between the form and detail arranged to reflect an image of the detail and through which movable members in the form on said support may be viewed from the image reflecting side of the plate, whereby upon adjustment of said members their view through the plate may be made to coincide with the image of corresponding detail.

8. An apparatus for registering forms comprising, in combination, a support for an impression form having therein movable members, means substantially coextensive with said support to support registering detail opposite and substantially parallel thereto, transparent and re-

flecting means midway between the form and detail arranged to reflect an image of the detail and through which the movable members in the form on said support may be viewed from the image reflecting side of the transparent-reflecting means, whereby upon adjustment of said members their view through the transparent reflecting means may be made to coincide with the image of corresponding detail.

9. An apparatus for registering forms comprising, in combination, a support for an impression form having therein movable members, means substantially coextensive with said support to support registering detail opposite thereto, transparent and reflecting means movable substantially over the area of and in a plane midway between the form and detail arranged to reflect an image of portions of the detail and through which a movable member in any part of the form on the support may be viewed, whereby upon adjustment of members in the form a view of them through the transparent reflecting means may be arranged to coincide with the image of corresponding detail.

10. An apparatus for registering forms comprising, in combination, a support for an impression form having movable members therein, means substantially coextensive with said support to support registering detail opposite and in a plane substantially parallel thereto, a relatively small transparent and reflecting means midway between the form and detail and movable therebetween substantially over the area thereof in a plane substantially parallel thereto arranged to reflect an image of portions of the detail and through which movable members in the form may be viewed, whereby said members may be adjusted so that their view through said transparent reflecting means coincides with the image of corresponding detail thereon.

11. An apparatus for registering forms com-

prising, in combination with a support for an impression form of means substantially coextensive with said support to sustain above and opposite the support registering detail to indicate the proper position of movable members in a form on the support and transparent and reflecting means midway between the form and detail arranged to reflect an image of the detail and through which the movable members may be viewed whereby by the adjustment of the movable members said view of them may be made to coincide with the image.

12. An apparatus for registering forms comprising, in combination, a support for an impression form, means substantially coextensive with said support to support opposite thereto registering detail, a relatively small transparent reflector movable opposite the portion of the form being registered in a plane midway between the form and detail, arranged to reflect an image of portions of the detail and through which movable members in the form on said support may be viewed, so that said members may be adjusted until a view of them through the reflector coincides with the image of corresponding detail thereon.

13. An apparatus for registering forms comprising, in combination, a support for an impression form, means substantially coextensive with said support to support opposite and parallel thereto registering detail, a relatively small transparent reflector movable in a plane midway between the form and detail arranged to reflect an image of portions of the detail and through which movable members in the form on said support may be viewed so that the members may be adjusted until a view of them through the transparent reflector coincides with an image of corresponding detail thereon.

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