June 17, 1952 A. L. NIELSEN 2,601,051

PHOTOGRAPHIC PRINTING MACHINE

Filed Jan. 25, 1950 2 SHEETS—SHEET 1

FIG. 1.

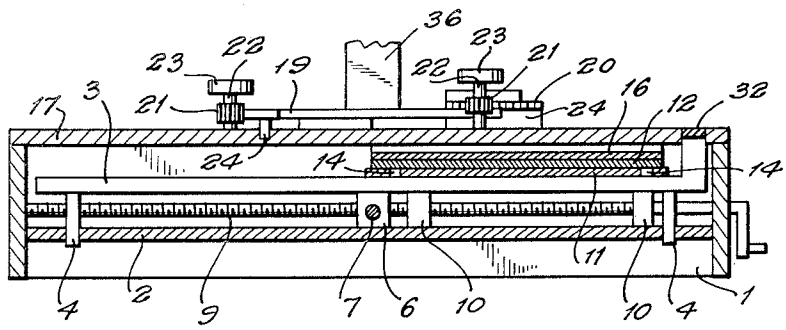
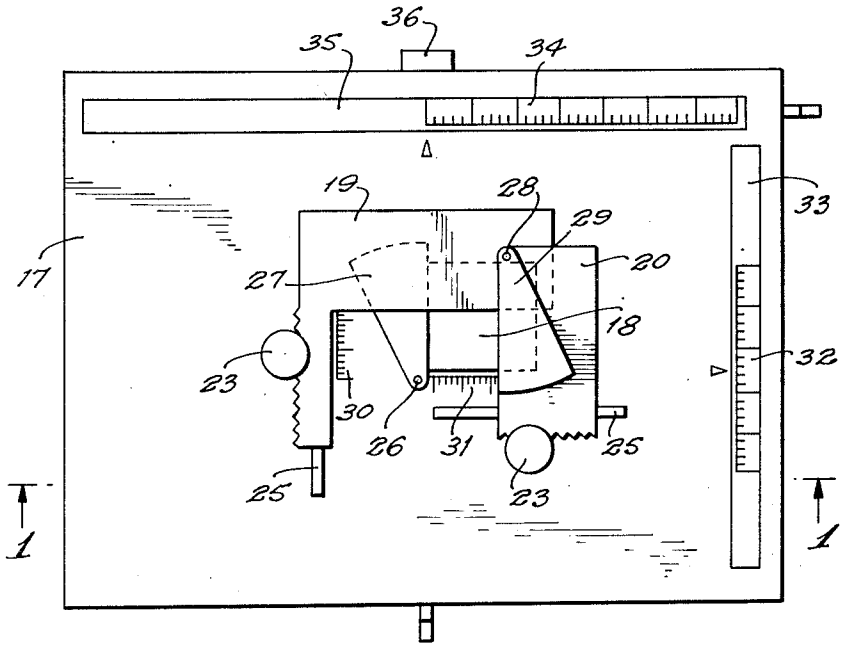


FIG. 2.



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FIG. 3.

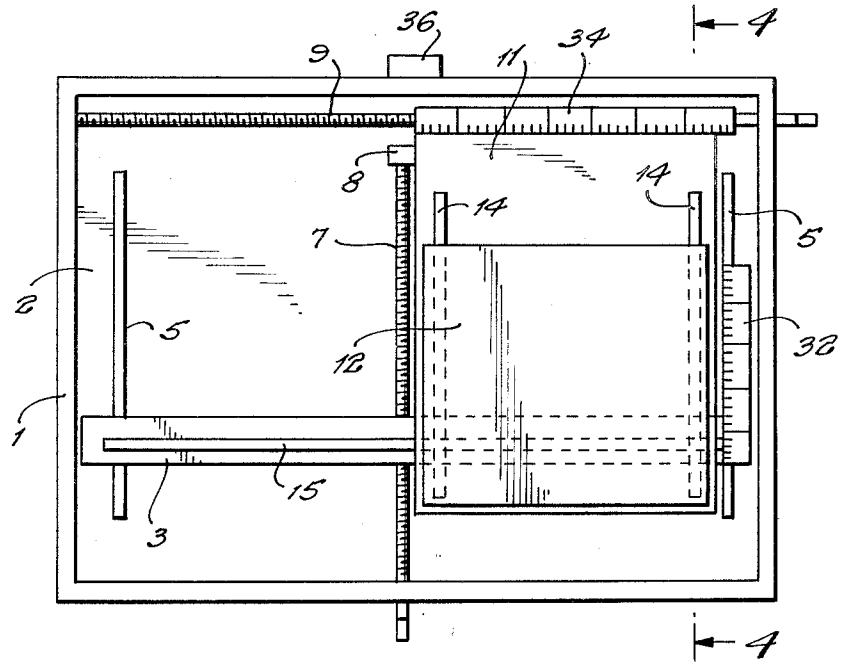
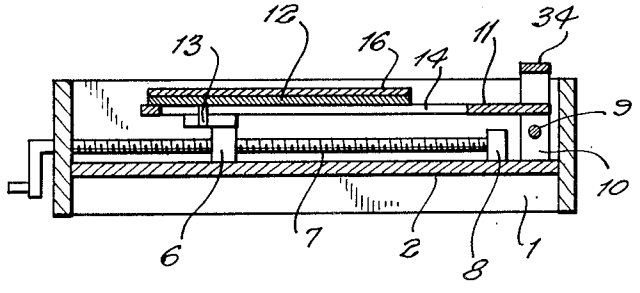


FIG. 4.



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UNITED STATES PATENT OFFICE

2,601,051

PHOTOGRAPHIC PRINTING MACHINE

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Application January 25, 1950, Serial No. 140,374
In Denmark January 28, 1949

3 Claims. (Cl. 88—24)

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The present invention relates to an apparatus for reproducing book printing type by a photographic process, and more particularly to an adjustable table for movably supporting a photosensitive sheet material.

It is the object of the present invention to provide an adjustable table which renders it possible to place letters, words, and lines projected from a type film which is movably mounted in an enlarging apparatus onto an exactly measurable area of a photographic paper.

With this object in view the present invention mainly consists in an apparatus for making enlarged photographic reproductions by photographing magnifying means, comprising in combination, supporting means for a photosensitive sheet material, transport means adapted to displace the supporting means in a plane parallel to the photosensitive sheet material in two directions normal to each other, measuring means adapted to indicate the extent of the displacement of the supporting means, adjustable means for varying the shape of the area, and further measuring means indicating position and dimensions of the area of the photosensitive sheet material exposed to light, and the size of the reproduced object.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view of an apparatus according to the invention taken on line 1—1 of Fig. 2;

Fig. 2 is a top view of the apparatus;

Fig. 3 is a plan view of the apparatus with the top plate thereof removed; and

Fig. 4 is a transversal sectional view taken on line 4—4 of Fig. 3.

The embodiment of the apparatus shown in the drawing consists of a box 1 with a fixed bottom 2. Above the bottom 2 a rail 3 is placed, which has on its underside guide pins 4, which are movably arranged in slots 5 of the bottom 2. At the underside of the rail 3 a nut 6 is arranged movably mounted on a spindle 7, which is rotatably mounted in a boring in one side of the box 1 and in a bearing 8 at the bottom 2. At right angles to this spindle another spindle 9 is mounted rotatably in borings in the ends of the box, and is screwed into nuts 10 at the underside of a first

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supporting plate 11. On the top of the plate 11 a second supporting plate 12 is arranged, which has at its underside guide pins 13 passing through slots 14 of the plate 11 and down into a slot 15 of the rail 3. On the top of the plate 12 a glass plate 16 is arranged.

The box 1 is closed by a top plate 17. This plate has a rectangular opening 18, the area of which may be varied by means of longitudinally and transversely movable covering wings 19 and 20, having in one edge a rack engaged by pinions 21 mounted on shafts 22. The shafts can be turned by means of knobs 23 attached thereto. At the underside of the covering wings 19 and 20 there is a rail 24, which is guided in slots 25 of the plate 17. On a pivot 26 of the covering plate 17 a plate 27, and on a pivot 28 of the wing 20 a plate 29 is pivotally mounted. When these plates are turned over the opening 18, italics can be measured. The adjustment of the wings 19 and 20 is made relatively to a rule 30 for the wing 19 and a rule 31 for the wing 20.

To one end of the rail 3 a rule 32 is attached, which passes through a slot 33 of the top plate 17. To the plate 11 a rule 34 is attached passing through a slot 35 in the top plate 17.

36 is a pillar for mounting on enlarging apparatus, not shown in the drawing.

The photo-sensitive sheet material is placed between the supporting plate 12 and the glass plate 16. The plates 12 and 16 are adjusted in one direction by shifting the rail 3 by rotation of the spindle 7, while they are moved at a right angle to this direction by rotating the spindle 9, by which the plate 11 is displaced together with the plates 12 and 16. These adjustments are controlled by the rules 32 and 34.

The size of the opening 18 of the top-plate 17 is decided by adjustment of the wings 19 and 20 and controlled by the rules 30 and 31.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of apparatus for reproducing book printing type differing from the types described above.

While the invention has been illustrated and described as embodied in an adjustable table for supporting a photographic paper, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily

adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specified aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

I claim:

1. An apparatus for making enlarged photographic reproductions by photographic magnifying means comprising in combination, a box having two parallel transversal guide slots in the bottom plate; a rail longitudinally extending through said box provided with a longitudinal slot; two guide pins rigidly secured to said rail and sliding in said guide slots in said bottom plate; a threaded transversally disposed spindle mounted rotatably in said box; a nut rigidly secured to said rail and adapted to be screwed along said transversal spindle when said spindle is rotated thereby moving said rail transversally; a first supporting plate mounted slidably on said rail and provided with at least two parallel transversal slots; a threaded longitudinally disposed spindle rotatably mounted in said box; a nut rigidly secured to said first supporting plate and adapted to be screwed along said longitudinally disposed spindle, whereby said first supporting plate is moved longitudinally; a second supporting plate slidably mounted on said first supporting plate; guide pins rigidly secured to said second supporting plate, and guided in said slots of said first supporting plate, and in said slot of said rail, so that said second supporting plate is moved longitudinally with said first supporting plate, when said longitudinal spindle is rotated, and moved transversally with said rail, when said transversal spindle is rotated; a glass plate disposed on top of said second supporting plate adapted to hold in place a sheet of photosensitive material placed on said second supporting plate; and measuring means adapted to measure the transversal and longitudinal displacements of said second supporting plate and said sheet of photosensitive material.

2. An apparatus for making enlarged photographic reproductions by photographic magnifying means comprising in combination, a box having two parallel transversal guide slots in the bottom plate; a rail longitudinally extending through said box provided with a longitudinal slot; two guide pins rigidly secured to said rail and sliding in said guide slots in said bottom plate; a threaded transversally disposed spindle mounted rotatably in said box; a nut rigidly secured to said rail and adapted to be screwed along said transversal spindle when said spindle is rotated thereby moving said rail transversally; a first supporting plate mounted slidably on said rail and provided with at least two parallel transversal slots; a threaded longitudinally disposed spindle rotatably mounted in said box; a nut rigidly secured to said first supporting plate and adapted to be screwed along said longitudinally disposed spindle, whereby said first supporting plate is moved longitudinally; a second supporting plate slidably mounted on said first supporting plate; guide pins rigidly secured to said second supporting plate, and guided in said slots of said first supporting plate, and in said slot of said rail, so that said second supporting plate is moved longitudinally with said first supporting plate, when said longitudinal spindle is rotated, and moved transversally with said rail, when said transversal spindle is rotated; a glass plate disposed on top of said second supporting plate adapted to hold in place a sheet of photosensitive material placed on said second supporting plate; measuring means adapted to measure the transversal and longitudinal displacements of said second supporting plate and said sheet of photosensitive material; adjustable means for varying the area of photosensitive sheet material exposed to light in two directions normal to each other; further adjustable means for varying the shape of said area; and further measuring means indicating position and dimensions of the area of said photosensitive sheet material exposed to light, and the size of the reproduced object.

3. An apparatus for making enlarged photographic reproductions by photographing magnifying means comprising in combination, supporting means for a photosensitive sheet material; transport means adapted to displace said supporting means in a plane parallel to said photosensitive sheet material in two directions normal to each other; measuring means adapted to indicate the extent of the displacement of said supporting means; a box having a rectangular opening in the top plate under which said supporting means for said photosensitive sheet material are placed; a first covering member slidably mounted on said top plate and adapted to be moved longitudinally across said opening; a first shaft rotatably mounted in said top plate; a knob rigidly secured to said first shaft; a pinion rigidly secured to said first shaft and engaging a rack on said first covering member so as to move said covering member longitudinally across said opening when said knob is turned; a second covering member slidably mounted on said top plate adapted to be moved transversely across said opening by means corresponding to the above described means for moving said first covering member longitudinally; two pivots in said top plate; a third and a fourth covering member turnably mounted on said pivots and adapted to cover portions of said opening in said top plate in such manner that an aperture having the shape of a parallelogram is formed so that by the respective motions of the covering members the area of the photosensitive sheet material exposed to light is reduced to any desired size; and measuring means indicating position and dimensions of the surface of said photosensitive sheet material exposed to light and of the position and dimensions of the reproduced object.

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