2 Sheets—Sheet 1.

C. H. O. RADDE.

PRINTING-PRESS.

No. 187,730. Patented Feb. 27, 1877.

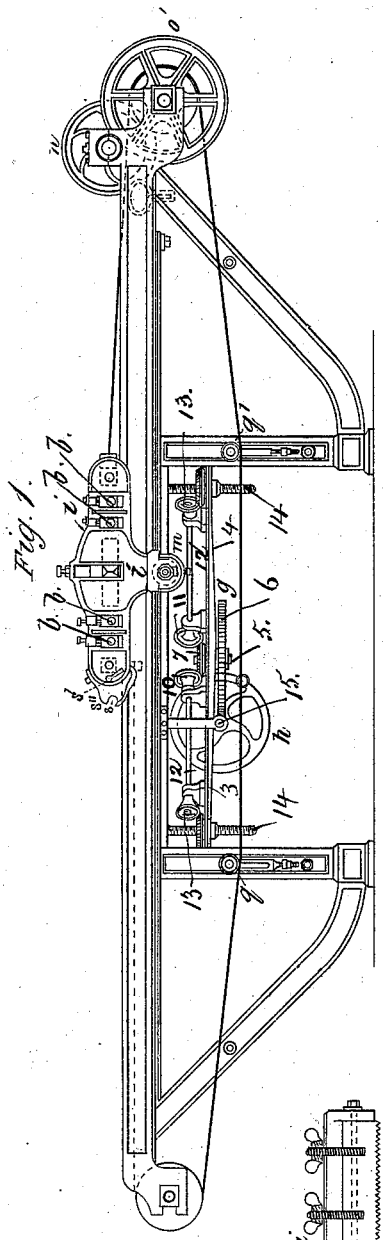


Fig. 1.

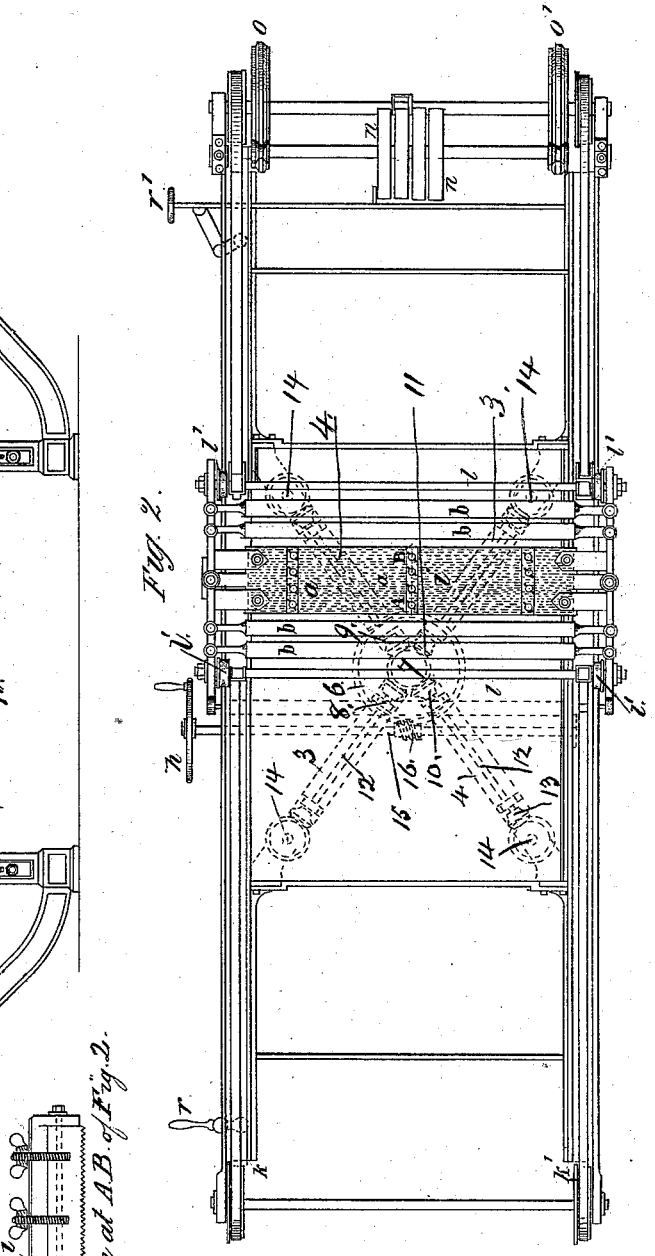
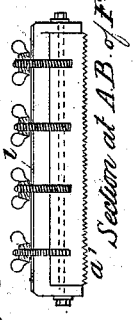


Fig. 2.



i' Section at A B of Fig. 2.

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L. Deane.

Inventor
Carl Heinrich Otto Radde.
by John J. Halsted.
Sec's Atty.

2 Sheets—Sheet 2.

C. H. O. RADDE.

PRINTING-PRESS.

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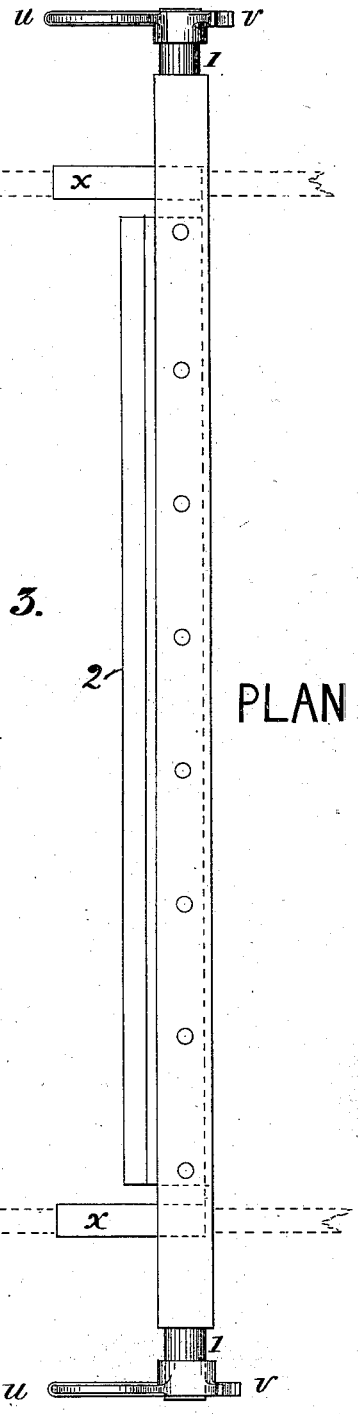
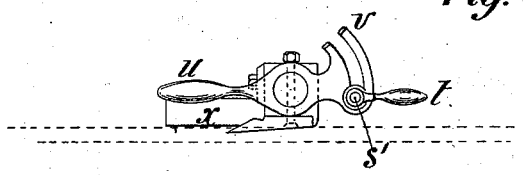


PLAN

Fig. 3.



END VIEW

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UNITED STATES PATENT OFFICE.

CARL H. O. RADDE, OF HAMBURG, GERMANY.

IMPROVEMENT IN PRINTING-PRESSES.

Specification forming part of Letters Patent No. **187,730**, dated February 27, 1877; application filed December 19, 1876.

To all whom it may concern:

Be it known that I, CARL HEINRICH OTTO RADDE, of Hamburg, in the Empire of Germany, merchant, have invented a new and useful Printing-Press, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The object of the invention is to facilitate the reproduction in quantity of copies of pictures or representations in varieties of colors or tints or shades, when such colors have been mixed with suitable composition, that will enable such combined colors and composition to be cut, molded, or shaped to desired forms, in order to such forms being composed into such relation one with another in a suitable frame or holder as, when so combined, to form on their surface a picture or representation, of which representation, by the aid of a suitable press, as hereinafter described, copies may be readily obtained upon paper or other suitable fabric or material prepared to receive such impressions.

Assuming that the various portions of colored matter from which, in the press, the impressions are to be taken have been all combined so as to form the desired representation, the supporting-board, with such mass of combined colored matter thereon, is now removed to a press, where it is laid with the surface of such matter horizontal, and the board is fixed on a table the height of which is adjustable by a series of screws connected to be actuated simultaneously, so as successively to bring the surface of the color in correct relation to the leveling-knife (which levels the surface of the coloring material) and to the rollers and rubbers.

Figures 1 and 2 represent an arrangement of press adapted to the purpose. *a* are the rubbers or teeth. Before and after them there are two rollers, *b*, on each side. *g* is the lifting apparatus, moved by the wheel or handle *h*, for adjusting the height of colored matters. *i* is a sledge or carriage to hold rubbers or rollers *b b*. These latter slide on the runner-rails *k k'*, and the sledge itself moves on the outer rail by means of two supporting-wheels, *l' l'*, on each side, and is controlled by one wheel, *m*, on the under side. Since the knife 2 only acts in a forward direction, to level the coloring material, it is necessary to lift it or turn it up when going backward after each act of leveling. For this purpose the tightening-screw at *s'* is loosened and the blade turned up around its own axle by the handle *u*. *n* are the wheels for the shaft, to be moved by steam or by handle or crank, as the case may be, and *o o'* are friction-wheels to receive an even motion, and to transmit the action of steam or handle or crank, as the case may be, to the press. The iron rods at *l* and *l* form connecting iron bars, and also axles for the wheels *l'* and *l'* *r r'* are the stop-levers and rods for starting and stopping the press. The knife, the rollers, and the rubbers are carried by the sledge or carriage *i*, which is actuated so that the rollers and the rubbers, when the knife has been removed, may be operated in either direction by means of straps or bands, aided by suitable guide-pulleys. The motion of the sledge is actuated by straps of leather or other suitable material, fastened to noses on the hind iron rod on each side, and then passing between the inner and outer rails and over rollers *q q'*, and fastened to the fore end of the sledge, but so low that the blade of the horizontal knife may pass over it freely, without injury, when in action.

Sometimes I use rollers alone, without rubbers, in a set of, say, eight equal rollers, instead of four rollers with a rubber or rubbers.

Fig. 3 shows the blade or horizontal knife and its position in action. The sledge *i*, Figs. 1 and 2, on its fore part *s''*, has a notch or catch, *s*, to receive the journals of the blade-shaft 1. This sledge or carriage carries also a screw, *s'*, and a handle, *t*, thereon. The blade 2 is, in length, equal to the full width of the press-bed, and is secured by screws upon a thick shaft, on which are the journals 1.

To secure correctness and stiffness of action to the blade, the ends of the blade and shaft within the width of the press are provided with guides or slides *x*, which slide along with the knife on the inner rail of the press, securing, at the same time, the desired angle of cut; and in order further to secure an absolutely safe action, the outer ends of the shaft 1 are provided with balance-handles and lever, so that the fore parts of the latter, *u*, serve as

handles, and the hind parts, *v*, as noses or hooks, which, when turned up by pressing the handle down, catch the pins *s'*, and are secured thereto by the tightening-screws.

After leveling the surface of the color, such surface is ready to receive the material on which the impression is to be taken.

To prevent an excess of dissolved coloring matter penetrating the paper or fabric on which the impression is to be made, it is desirable to cover such paper or fabric with one or more sheets of red blotting-paper, of the best and most even make, or similar paper.

An impression having been taken by slight pressure on the sheet of material, the mass of color is then, to the slightest extent, raised by turning the wheel or handle *h*, and another sheet is applied and acted upon, and so on with each in succession, until the whole mass of combined color has been absorbed, when it will be found that each sheet has received a like impression.

The mechanism for raising, at the proper periods, the board which supports the mass of previously-prepared combined colored matter I will now describe more in detail. This lifting apparatus is placed mainly on a stationary bed, consisting of two diagonal bars, 3 4, (see Figs. 1 and 2,) affixed to the frame of the press, and crossing each other at the center. Mounted centrally upon these bars is a shaft, 5, provided with a geared wheel, 6, and bevel-gear 7. This gear 7 engages with four bevel-gears, 8 9 10 11, each of which is upon its own respective shaft 12, which shafts extend severally from the center toward the four corners of that part of the press in which the board or frame containing the coloring material is to be placed, and bevel-gears 13 on the extremities of these shafts 12 engage, respectively, with bevel-gears on the vertical screws 14, each of which enters a threaded hole in the diagonal bars 3 4, the ends of these screws being free. The upper free ends of these screws 14 are ready to receive and sustain the board which supports the mass of colored or coloring material.

A cross-shaft, 15, on which is the handle *h*, is provided with a worm-gear, 16, which engages with the gear 6, and by turning this cross-shaft, as occasion requires, the mass of coloring material is steadily and uniformly lifted with precision, preserving continuously its level or horizontal surface, and presenting this surface ready for the successive repetitions of the printing, as the mass is, from time to time, consumed by parting with a portion of itself to give the repeated impressions to the paper.

The material on which the impressions are taken, if paper, is that manufactured from clean cotton rags deprived of starch, of as uniform a character as possible, and left absolutely absorbent. Such paper, before use, I saturate with a suitable composition of matter to dampen the same, the more readily to receive the impressions of color.

When the impressions have to be taken upon paper, I cover the block or cake first with very thin muslin dampened with turpentine or the dissolving mixture. The color then penetrates the muslin very evenly, and gives a better impression on the paper. In like manner I take impressions on other fabrics deprived of starch or other dressing, but saturated with the oil of turpentine, or combination of turpentine with other matters, before use.

The fabrics, when printed, are first passed over a heated surface in order to evaporate the spirit of turpentine, and they are then dried in a hot chamber.

Representations obtained by such combinations of colors may have applied to them corresponding or other representations by photography, printing, or other process.

The invention affords facility for the application thereto of the "Woodbury" process of printing, or other printing, in the colors.

Extra sunlight and other extra effects of light or shade may be obtained by additional prints of the required tints at the back of the sheets already printed, as described, in colors on the face.

Having thus described my invention and means which I adopt, I would have it understood that what I claim is—

1. In a press adapted for printing and reproducing in quantity copies of representations in varieties of colors, as a means for adjusting the height of the mass of colored composition, the combination of the worm-shaft 15 16, gears 6 7, diagonal geared shafts 12, and screws 14, and their gears, the combination operating as set forth.

2. The combination of the frame or carriage *i*, rollers *b b*, rubbers *a*, and knife or blade 2, the parts operating substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL HEINRICH OTTO RADDE.

Witnesses:
PAUL MÖLLER,
H. SCHRADER.