March 22, 1932. L. RADO 1,850,334

PROCESS AND APPARATUS FOR THE PRODUCTION OF MULTICOLORED REPRESENTATIONS

Filed Nov. 30, 1927 2 Sheets-Sheet 1

Fig. 1.

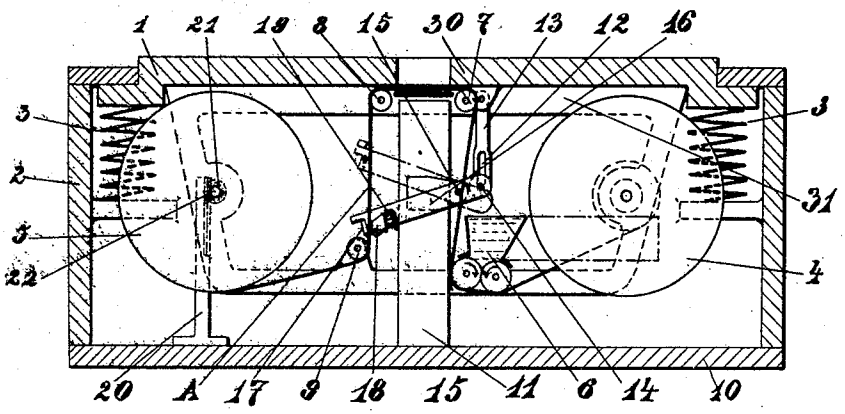

Fig. 2.

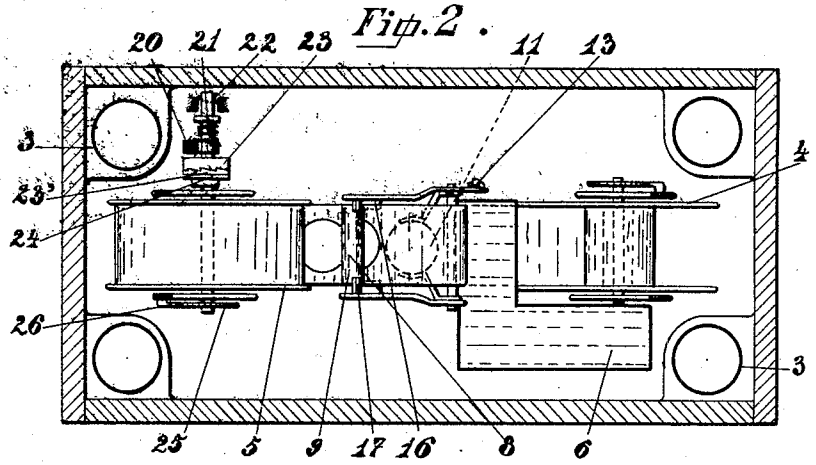

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Fig. 3.

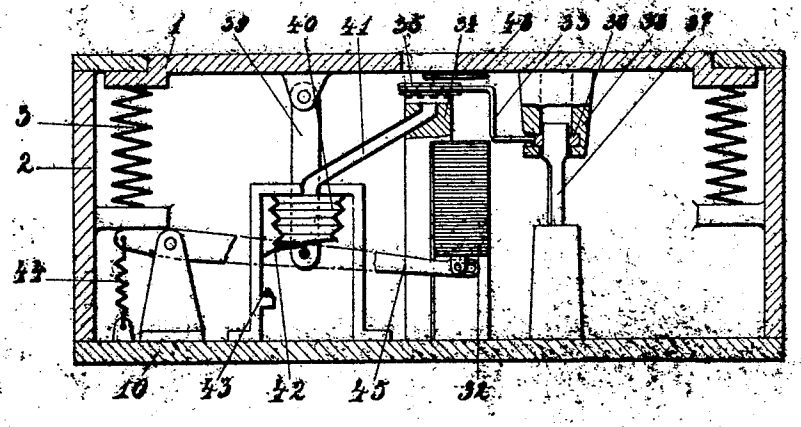


Fig. 4.

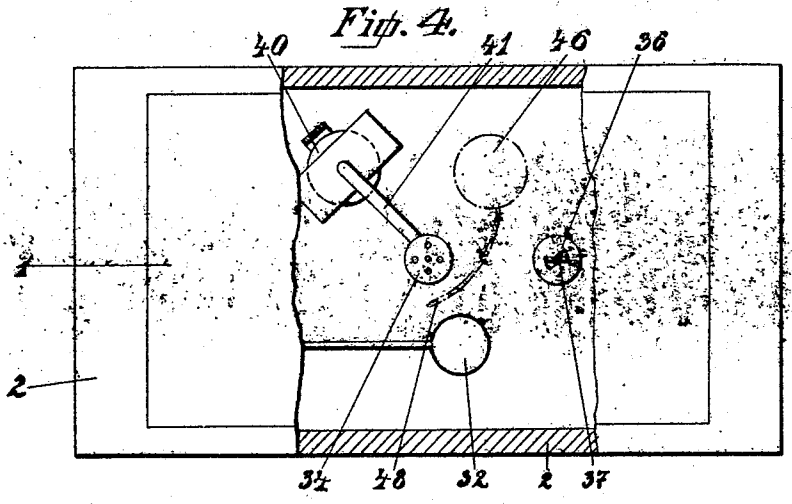
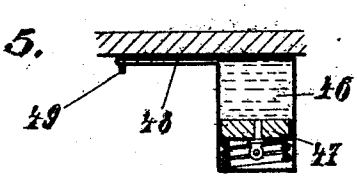


Fig. 5.



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UNITED STATES PATENT OFFICE

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PROCESS AND APPARATUS FOR THE PRODUCTION OF MULTICOLORED REPRESENTATIONS

Application filed November 30, 1927, Serial No. 236,750, and in Germany March 25, 1927.

This invention relates to a process and apparatus for the production of multicolored decorations upon supports of print in the pasting of certain parts of the representation in the course of the normal printing operation colored pieces of paper, metal foil or the like on to the paper or the like which receives the impression which process consists in preparing said pieces of sheet by a gumming or damping device and applying them by a feeding device to the support of print in the course of the normal printing operation, advantageously by the co-operation of the printing cylinder with the printing surface, so that the printing of the representation and its completion by the pasted on pieces take place simultaneously and which apparatus is characterized by a gumming or damping device for the preparation of the sheet material and by a feeding device for the application of the pieces of paper or the like, which devices are actuated by the co-operation of the printing cylinder with a yielding part of the printing surface.

The subject matter of the invention is illustrated in two constructional forms by way of example in the accompanying drawings

Figs. 1 and 2 are sectional views and show in elevation and plan an apparatus in which the pieces of paper, metal foil or the like to be pasted on are stamped out of an intermittently moving web or length of the material, while

Figs. 3 and 4 are also sectional views and show likewise in elevation and plan an apparatus in which leaflets already cut to shape and ready gummed are taken from a pile.

Fig. 5 illustrates a detail of the apparatus shown in Figs. 3 and 4.

In the constructional form shown in Figs. 1 and 2 the printing part 1 of the block is movable in the direction in which printing takes place i. e. at right angles to the plane to be printed and tends to be constantly pressed upwards by the springs 3. To the part 1 are rigidly attached the bearings for two drums 4 and 5. The web of paper, metal foil or the like drawn off the drum 4 passes first through a gumming apparatus 6 and then runs over rollers 7, 8 and 9. The stationary stamping plunger 11 is carried by the base plate 10 of the block. To the part 1 is fixed a link 13 provided with a slot 12. In this slot 12 engages a pin 14 on a lever 16 rotating about a pivot 15 mounted in a stationary part of the block. The lever 16 has a lug 17 and also a finger or cam 18, which a spring 19 tends to press constantly against the web A. From the base plate 10 a rack 20 projects upwards and gears into a gear wheel 21 on the shaft 22 of the drum 5. On the shaft 22 is mounted a jaw clutch 23, the clutch member 23′ of which co-operates with a friction disc 24. There is also mounted on this shaft a ratchet wheel 25 with which a pawl 26 co-operates.

If the movable part 1 of the block be depressed by the printing cylinder (not shown) 13, 4 and 5 together with the web A and its roller guide, and also the device 6 will move downwards. The punch or stamp 11 stamps a piece out of the web A and conveys this piece through the opening 30 in the movable part of the block upwards, until the stamped-out piece lies at the same height with the printing surface of the part 1, and is pasted to the paper or the like pressed against it by the printing cylinder. The impression of the part 1 of the block and the pasting on of the stamped-out piece of paper, metal foil or the like, are therefore carried out simultaneously.

On the downward movement of the block 1 the link 13 carries the lever 16 with it and rocks it about the pivot 15 into the position shown by dot and dash lines in which the lever 16 bears against a stop 31. During this movement of the lever the finger or cam 18 slides along the web A without clamping it. The drum 5 does not rotate during the upward movement of the part 1 of the block, as it is prevented from doing so by the ratchet mechanism 25, 26 and the two clutch members 23, 23′ run idly over each other. The web A therefore is stationary during the stamping and sticking on operations.

When the part 1 of the block moves upwards again the link 13 is carried with it and after passing through the slot 12 the lever 16 is returned to the drawn position. At the same time the web A is clamped between the lug 17 and the finger or cam 18

and drawn off to a corresponding extent from the drum 4. By the cooperation of the rack 20 with the gear wheel 21 the drum 5 will be simultaneously rotated by means of the clutch 23, 23', as the ratchet mechanism 25, 26 permits of movement in this direction, and thereby the corresponding part of the web A is wound up on this drum.

In the constructional form shown the drums 4 and 5 and also the gumming apparatus 6 will be placed in the block itself. These parts may however also be placed outside the block. In like manner the drums 4 and 5 and the gumming apparatus 6 may be arranged underneath the block.

In the constructional form shown in Figs. 3 to 5, the colored pieces of paper, metal foil and the like are taken from a pile which is placed inside a block with a movable printing surface. 32 denotes the pile from which each separate sheet is taken by means of an arm 33 and supplied to a standard 34. This arm 33 carries on one end a plate 35 of felt or the like which is kept constantly moist by the arrangement shown in Fig. 5. The end of the arm 33 engages with a nut 36 which surrounds a portion 37 which is guided in a bearing 38 fixed to the part 1.

To the movable part is pivoted a lever 39 which is connected to the underside of a bellows 40. From this latter a pipe 41 leads under the upper end of the standard 34 and on the underside of the bellows 40 is provided a valve 42, which can co-operate with a fixed stop 43. A two-armed lever 45 controlled by a spring 44 serves always to keep the pile adjusted to the height of the top sheet.

Let it be assumed that a leaflet to be pasted on is already on the standard 34. When the movable part 1 of the block descends, the arm 33 will first be rocked by the co-operation of 36 with 37, in such a way that it and the plate 35 will pass out of the path of the standard 34 above the pile 32. On the further downward movement of the part 1 of the block the arm 33 will now move parallel to itself downwards and touch the topmost sheet of the pile 32 with its moistened plate 35. The leaflets of the pile 32 are gummed on their upper sides. As soon as the part 1 of the block has moved so far downwards that its upper side lies at the same height as the leaflet lying on the standard 34, this leaflet will be pasted by the pressure of the printing roller to the paper receiving the impression. During the descent of the part 1 the bellows 40 is extended by means of the lever 39 so that in it and in the pipe 41 and also below the leaflet lying on the standard a vacuum will be created, which will hold the leaflet securely on the standard. When the part 1 has reached its lowermost position, the valve 42 strikes against the stop 43 and is opened thereby, so that air can pass into the bellows and the vacuum previously existing therein is again destroyed. This is the instant when the sticking on of the leaflet lying on the standard takes place, at which instant the leaflet consequently is no longer under the action of the vacuum in the bellows 40.

On the withdrawal of the part 1 of the block, the arm 33 moves with the leaflet adhering to the felt plate 35 parallel with itself upwards. Towards the end of the upward movement the nut 36 again engages with the screw threaded part 37 and is thereby again rotated into position above the standard 34. The bellows 40 is at the same time again compressed by the lever 37 and on the next descent of the part 1 of the block the bellows is again explained, whereby the leaflet is sucked against the standard and securely held thereon, while the arm 33 with its ring 35 is swung away from the standard towards the pile 32 and the above cycle of operations is repeated.

In order always to keep the felt plate 35 moist, a water reservoir 46 with a spring controlled piston 47 is provided (Fig. 5). From this reservoir branches off a capillary tube 48. At an opening 49 in this tube a drop of water forms, past which the felt plate 35 moves each time the arm 33 is rocked and takes up the drop formed.

The arrangement described may be used in all kinds of ways. Thus for example instead of one pile, several piles may be placed in the block. The pile may however also be arranged outside the block, so that no limitation is imposed as to the size of the pile. The arrangement of the apparatus may also be such that the pile projects with its upper end only into the block and its main part extends below the block. It is obvious that the feed devices which convey the leaflet from the pile to the point where it is pasted on must not also be placed inside the block.

What I claim is:

1. In combination, a printing block carrying an opening extending therethrough at right angles to the printing surface and a punching plunger in register with the said opening, means for effecting a vertical motion of the said printing block, and means for obtaining printed illustrations or designs over the upper surface of the said punching plunger.

2. In combination, a printing block carrying an opening extending therethrough at right angles to the printing surface and a punching plunger in register with the said opening, means for effecting vertical motion of the said printing block, means for passing a web of printed illustrations or designs over the upper surface of the said plunger, and means for applying a layer of adhesive to the under surface of the said web.

3. In combination, a printing block carry-

ing an opening extending therethrough at right angles to the printing surface, a plunger in register with the said opening, a standard adapted to receive a stack of printed illustrations or designs, means for transporting a printed illustration from the said stack to the said plunger and vacuum means cooperating with the said plunger whereby the said printed illustration or design is caused to adhere to the said plunger.

4. The process of simultaneously printing and affixing a painted illustration to a sheet of paper, cloth or the like which comprises affixing a printed illustration or design gummed on its reverse side, and which reverse side has been moistened shortly before its affixation to the said sheet, by pressing the said illustration or design against the said sheet by appropriate means and simultaneously printing the said sheet by other means cooperating with the first named means, which impress an inked printing form at the appropriate portion of the said sheet.

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