W. A. AMES.

PRINTING PRESS.

APPLICATION FILED JULY 8, 1910.

982,199.

Patented Jan. 17, 1911.

3 SHEETS—SHEET 1.

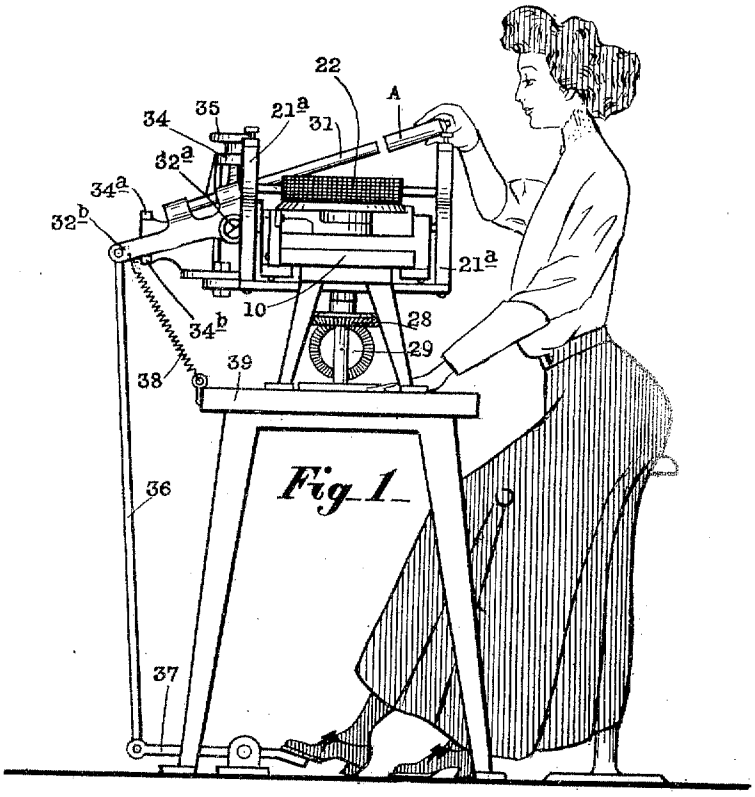
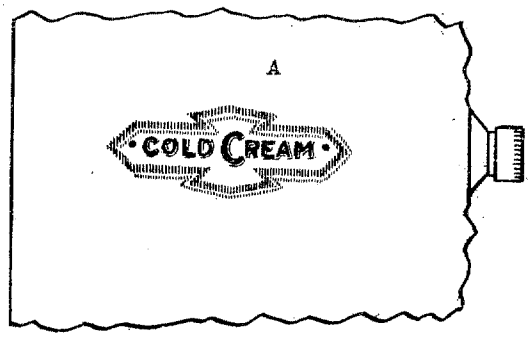


Fig 1.

Fig 2.



WITNESSES:

Frank C. Palmer

Madeline D. Ritchie.

William A. Ames, INVENTOR,

BY Frank H. Allen

ATTORNEY.

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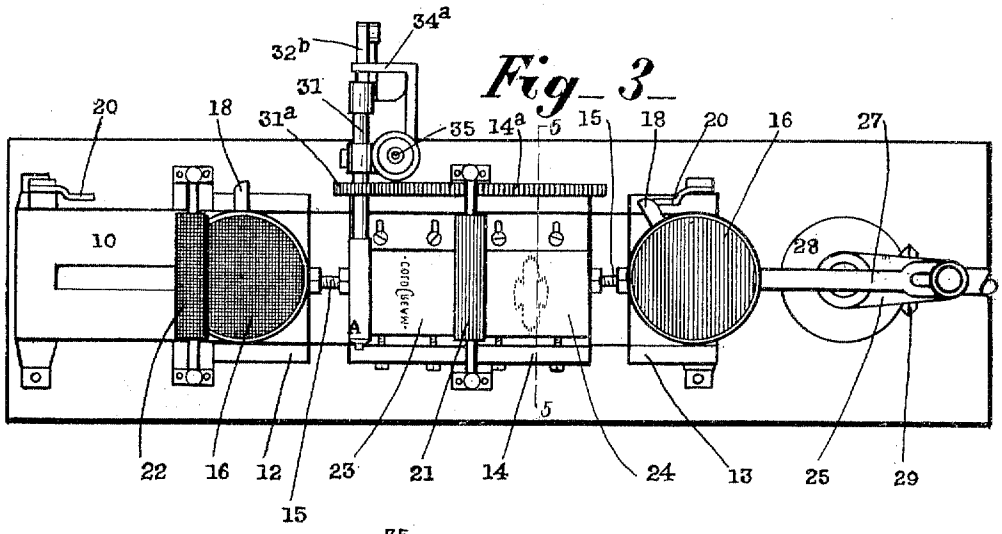
3 SHEETS—SHEET 2.

Fig. 3.



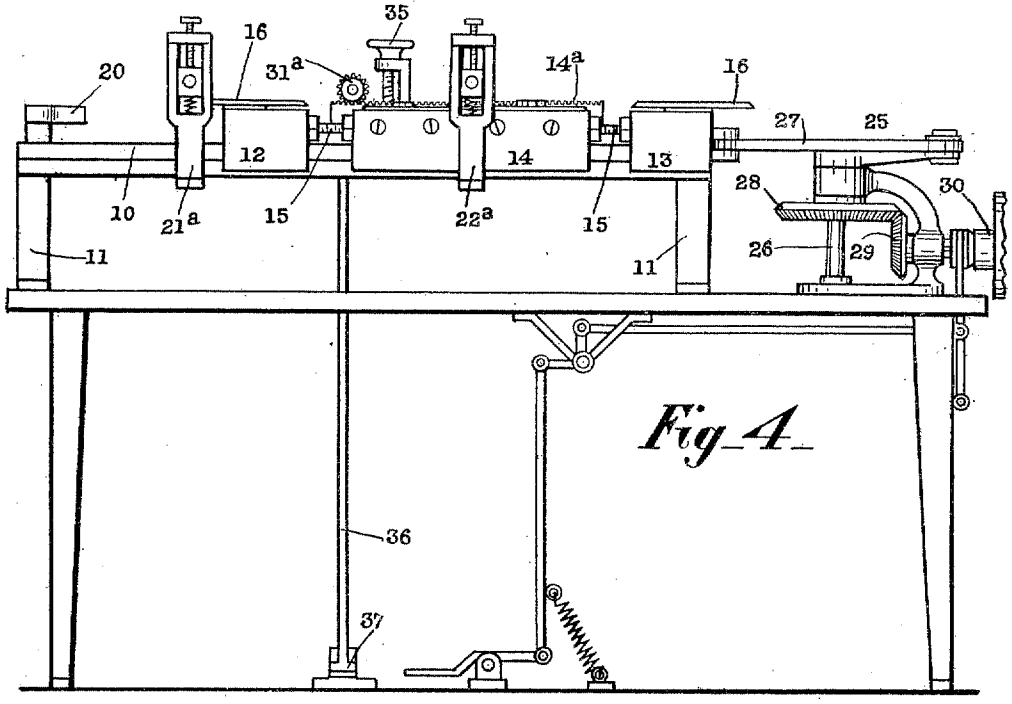


Fig. 4.

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3 SHEETS—SHEET 3.

*Fig_5_*

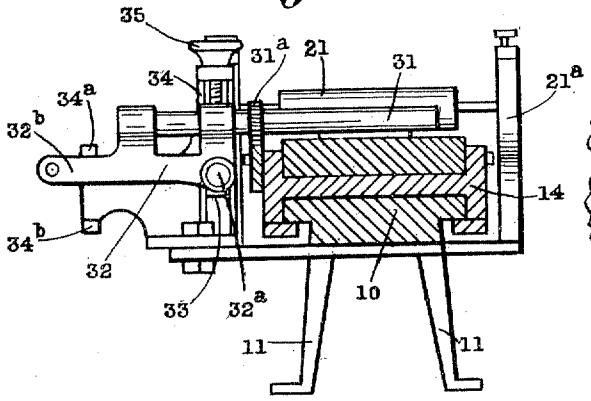


*Fig_6_*

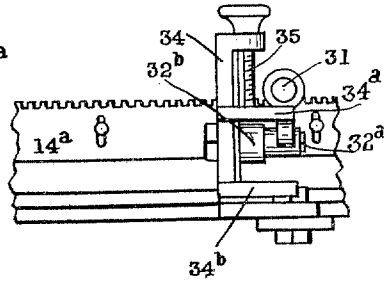


*Fig_7_*

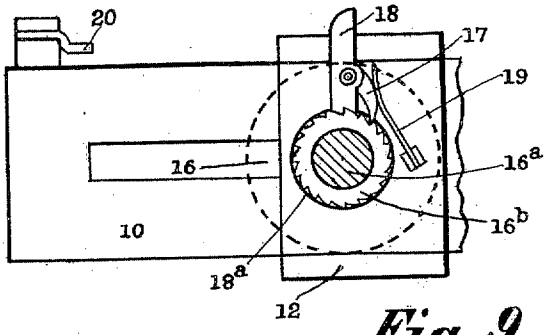


*Fig_8_*

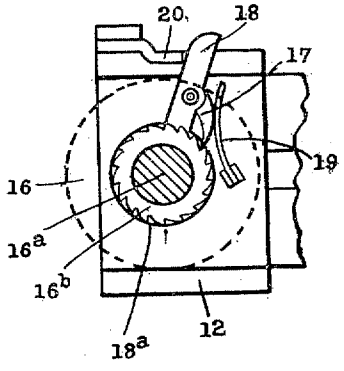
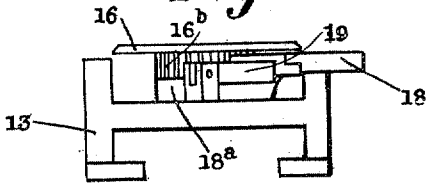


*Fig_9_*



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UNITED STATES PATENT OFFICE.

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PRINTING-PRESS.

982,199. Specification of Letters Patent. **Patented Jan. 17, 1911.**

Application filed July 8, 1910. Serial No. 571,086.

To all whom it may concern:

Be it known that I, WILLIAM A. AMES, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

This invention relates to printing presses of the "reciprocating bed and cylinder" type, and my immediate object is to provide a simple and convenient form of press that is specially adapted for printing a plurality of colors directly upon collapsible tubes of the class commonly used in marketing toilet cream, tooth paste, paint, and the like pasty substances. For the purpose of explaining said invention clearly I have provided the annexed drawings, in which—

Figure 1 is an end elevation of a printing machine embodying my present improvements; illustrating also the manner of operating the same, and Fig. 2 is a view of a printed tube; the body portion of said tube having been cut longitudinally and then flattened out. Fig. 3 is a plan view and Fig. 4 is a front side elevation of said machine. Fig. 5 is a transverse, sectional, view taken on the line 5—5 of Fig. 3. Fig. 6 is a rear side elevation of a portion of the rack and of the machine bed, and shows also the adjustable means for mounting the mandrel which supports the tube while the latter is being printed. Figs. 7, 8 and 9 are detail views of the mechanism by means of which the ink disks are rotated, with a step-by-step movement, in order to insure a more perfect distribution of said ink.

Referring now to these drawings, the reference numeral 10 indicates a rectangular bed that is mounted, as here shown, on legs 11, the said bed being formed with laterally extended edge portions, upon which are slidably mounted, at or near the opposite ends of the bed, carriages 12 and 13 and between the said carriages 12—13 is a form-supporting carriage 14 that is made adjustable, relatively to the end carriages by means of screws and nuts 15, as will be understood by reference to Figs. 3 and 4 of the drawings.

Upon each of the end carriages is rotatively mounted an inking disk 16, the construction of which will be best understood by reference to Figs. 7, 8 and 9. The disk is formed with a central hub 16^a that is socketed in a hole in the carriage and said disk is also formed with a ratchet disk 16^b that is engaged by a pawl 17 hung on an arm 18 whose inner end portion is formed as a ring 18^a that is loosely mounted on the hub of the ink disk. A spring 19 operates to hold the pawl 17 in engagement with the ratchet disk and also serves to force the arm 18 back to its normal, or starting, position, as in Fig. 7. Located in the path of said arm 18 is a stop 20 which is engaged by the said arm at each forward movement of the carriage 12 or 13, as the case may be, and, as the said carriage continues to move forward, the pawl arm is stopped and rocked, as seen in Fig. 8, thus causing the ink disk to be partially rotated.

The ink-rolls proper are indicated by the numerals 21—22 and they are mounted, respectively, in stands 21^a and 22^a secured to the bed 10, in such manner, and in such relation to the described ink disks that, when the carriages 12 and 13 are reciprocated on bed 10, one of the disks 16 will pass under the roll 21 and the other disk will pass under the roll 22, each disk depositing a fresh supply of ink on its coöperating roll.

When my described machine is to be used in printing in two colors the two forms 23 and 24 are locked up in the carriage 14 and the said carriage is adjusted, relatively to the disk-supporting carriages 12 and 13, so that when the carriages are moved in one direction on bed 10 the inking roll 21 will pass over the form 24 and ink it but will not engage the form 23 and so that, when the carriages are moved in the opposite direction, the inking roll 22 will pass over the form 23, and ink it, but will not engage the form 24. Thus it will be seen that the distribution of the ink, and the inking of the two forms in different colors, will be accomplished automatically during the forward and backward movement of the reciprocating beds 12, 13 and 14. The reciprocation of said beds is performed, as here illustrated, by means of a crank-arm 25, carried by a vertical shaft 26, and a pitman 27 that is connected with the carriage 13, and the revolution of shaft 26 is effected by

means of bevel gears 28—29 and a friction-clutch pulley 30 but the said driving mechanism forms no part of my present invention and may be replaced by any practical form of reciprocating mechanism.

I will now describe the novel means which I have provided for supporting the tubes while they are being printed. Said means consists of a mandrel 31 which is revolubly mounted in a frame 32 that is fulcrumed at 32^a on a block 33 that is mounted to slide vertically in a fixed frame 34. The block 33 is preferably mounted on a screw 35 in such manner that the rotation of said screw will cause the block, and the connected carriage and mandrel, to rise or fall vertically, according to the direction of rotation of the said screw. The rear end portion of the frame 32 is extended, as at 32^b, and is connected by a rod 36 with a foot treadle 37 that is located within convenient reach of the foot of the operator of the machine. The said extension 32^b is limited, as to its vertical movement, by stop-lugs 34^a—34^b on the frame 34, as will be best understood by reference to Figs. 1, 5 and 6 of the drawings. The frame 34 is thus permitted to rock on its fulcrum 32^a in order that the free end of the mandrel may be elevated, out of engagement with the printing forms, and so as to receive and discharge the tubes (see Fig. 1). The mandrel is held, normally, in its elevated position by means of a spring 38 which connects the extension 32^b with some fixture, as for example, a table 39 upon which the described machine is mounted.

My described printing machine is operated as follows, assuming that the ink disks and rolls have been supplied with ink. With the mandrel 31 elevated, as in Fig. 1, a tube A is slipped onto said mandrel and the mandrel is then lowered to a horizontal position by means of the treadle 37 and connecting rod 36, thus bringing the tube into the path traveled by the reciprocating forms 23 and 24. As the said forms move forward, or backward, as the case may be, the first form engaging the tube prints an impression thereon and then the second form overlays the said impression with a second impression of another color; the perimeter of the tube being caused to travel at the same speed as the forms, by means of a rack 14^a attached to the carriage 14 and a coöperating pinion gear 31^a on the mandrel 31.

It should be noted that the described manner of supporting the mandrel permits it to be adjusted bodily, vertically, to compensate for the variance in thickness of the tubes to be printed.

My described machine occupies little space, it may be built at reasonably small cost, and the speed with which it may be operated is limited only by the dexterity of the operator.

Having thus described my invention I claim as new and wish to secure by Letters Patent:—

1. The combination with a printing machine, of a bed, a carriage slidably mounted on said bed, a plurality of printing forms on said carriage, a frame fulcrumed and mounted to slide vertically, a revolubly mounted mandrel in said frame adapted to be tilted out of operation, said mandrel adapted to carry a tube for coöperation with said forms.

2. The combination with a printing machine, of a bed, a carriage slidably mounted on said bed, a plurality of printing forms on said carriage, a frame fulcrumed and mounted to slide vertically, a revolubly mounted mandrel in said frame adapted to be tilted out of operation, said mandrel adapted to carry a tube for coöperation with said forms, and means for causing the perimeter of the tube to travel at the same rate as the forms.

3. The combination with a printing machine, of a bed, a carriage slidably mounted on said bed, a plurality of printing forms on said carriage, a frame fulcrumed and mounted to slide vertically, a revolubly mounted mandrel in said frame adapted to be tilted out of operation, said mandrel adapted to carry a tube for coöperation with said forms, and coöperating means on the carriage and mandrel for causing the perimeter of the tube to travel at the same speed as the forms.

4. The combination with a printing machine, of a bed, a carriage slidably mounted on said bed, a plurality of printing forms on said carriage, a frame fulcrumed and mounted to slide vertically, a revolubly mounted mandrel in said frame adapted to be tilted out of operation, said mandrel adapted to carry a tube for coöperation with said forms, a rack attached to the carriage, and a coöperating gear on the mandrel for causing the perimeter of the tube to travel at the same speed as the forms.

5. In a printing machine, the combination of two independently operable inking rolls, a carriage mounted to reciprocate under said rolls, a plurality of printing forms mounted on said carriage, a mandrel, a frame in which said mandrel is revolubly mounted, a block mounted to slide vertically and on which said frame is fulcrumed, the said mandrel being adapted to be tilted out of operative relation and designed to revolubly support a tube in the path of the forms.

6. In a printing machine, the combination of two independently operable inking rolls, a carriage mounted to reciprocate under said rolls, a plurality of printing forms mounted on said carriage, a mandrel, a frame in which said mandrel is revolubly mounted, a block mounted to slide vertically and on which said frame is fulcrumed, the

said mandrel being designed to revolubly support a tube in the path of the forms, and means for causing the block and mandrel to rise or fall vertically.

7. In a printing machine, the combination of two independently operable inking rolls, a carriage mounted to reciprocate under said rolls, a plurality of printing forms mounted on said carriage, a mandrel, a frame in which said mandrel is revolubly mounted, a block mounted to slide vertically and on which said frame is fulcrumed, the said mandrel being designed to revolubly support a tube in the path of the forms, and revoluble means for causing the block and mandrel to rise or fall vertically.

8. In combination, in a printing machine, two independently operable inking rolls spaced apart, a carriage mounted to reciprocate under the said rolls, a plurality of printing forms adjustably mounted on said carriage, a revolubly mounted mandrel adapted to carry a tube for coöperation with said forms, a vertically slidable block, a frame fulcrumed on said block and means for reciprocating the said carriage.

9. In a printing machine, the combination with two independently operable inking rolls, a carriage mounted to reciprocate under said rolls, a plurality of printing forms mounted on said carriage, means for supporting a tube in the path of said forms, said means comprising a mandrel, a vertically movable block, a frame fulcrumed thereon and in which said mandrel is revolubly mounted, and means for rocking said mandrel to move the tube into and out of the path of the forms.

10. In combination, in a printing machine, a carriage, means for reciprocating the said carriage, a plurality of printing forms adjustably mounted on said carriage, a fulcrumed tube-supporting mandrel, a vertically movable block, a frame thereon and on which the mandrel is revolubly mounted and means for limiting the rocking movement of said mandrel.

11. In combination, in a printing machine, a bed, a carriage slidably mounted on said bed, a plurality of printing forms on said carriage, ink disks located at opposite ends of said carriage and movable therewith, and means for adjusting the said carriage relatively to said ink disks.

WILLIAM A. AMES.

Witnesses:
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EVERETT R. SMITH.