

[54] **TRANSVERSE FRAME ADJUSTMENT
MEANS FOR SILK SCREEN PRINTING
APPARATUS**

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[58] Field of Search 101/124, 127.1, 128.1,
101/115, 114, 129, 150, 151, 282, 286

[56] **References Cited**

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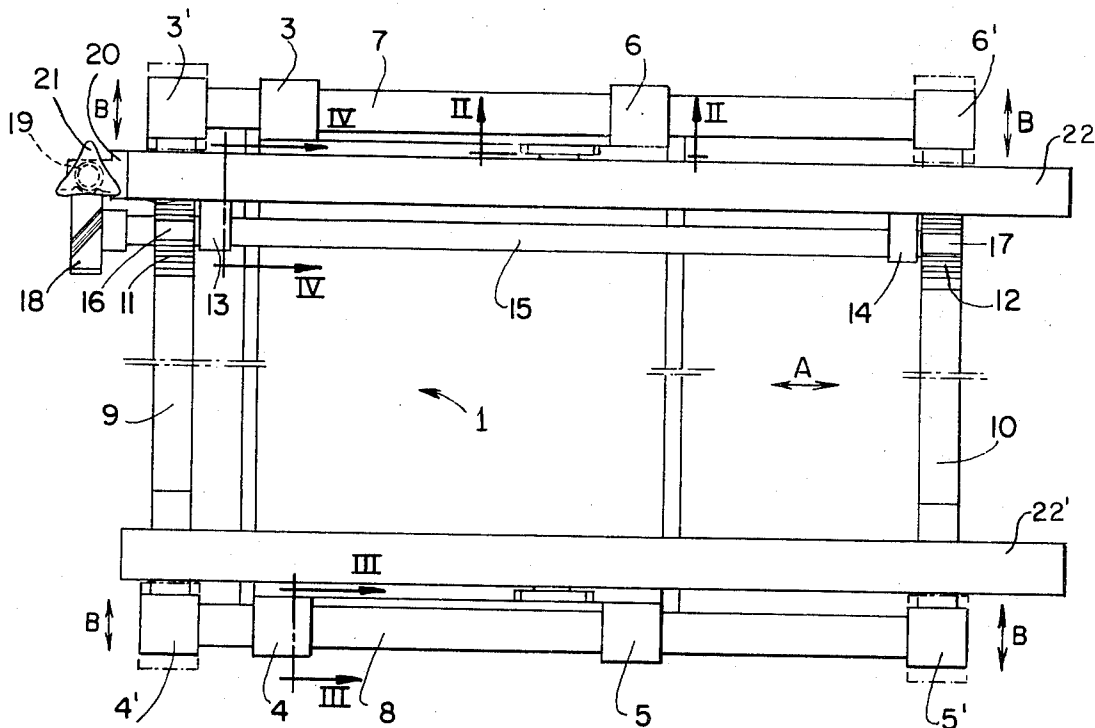
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[57]

ABSTRACT

In silk screen printing machines in which there is a printing frame required to be transversely registered, a pair of longitudinally arranged parallel guides, the printing frame being slidably mounted on said guides for reciprocable movement in a first direction, a second pair of longitudinal guides arranged at right angles to said first pair of guides and coupled to said first pair of guides for reciprocable movement in a second direction at right angle relative to said first direction, the printing frame being mounted to said first and second pair of guides, a first rack and pinion coupling capable of moving said printing frame in said first direction and a second rack and pinion coupling operable on said pair of second guides to move said printing frame in said second direction, a worm gear coupled to the pinion of said second rack and pinion coupling and an endless screw coupled to said worm gear and to said printing frame. A control wheel is operatively coupled to said worm gear by way of said endless screw, manipulation of said wheel being effective to move said printing frame along said second pair of guides to effect movement thereof in the second direction.

2 Claims, 4 Drawing Figures



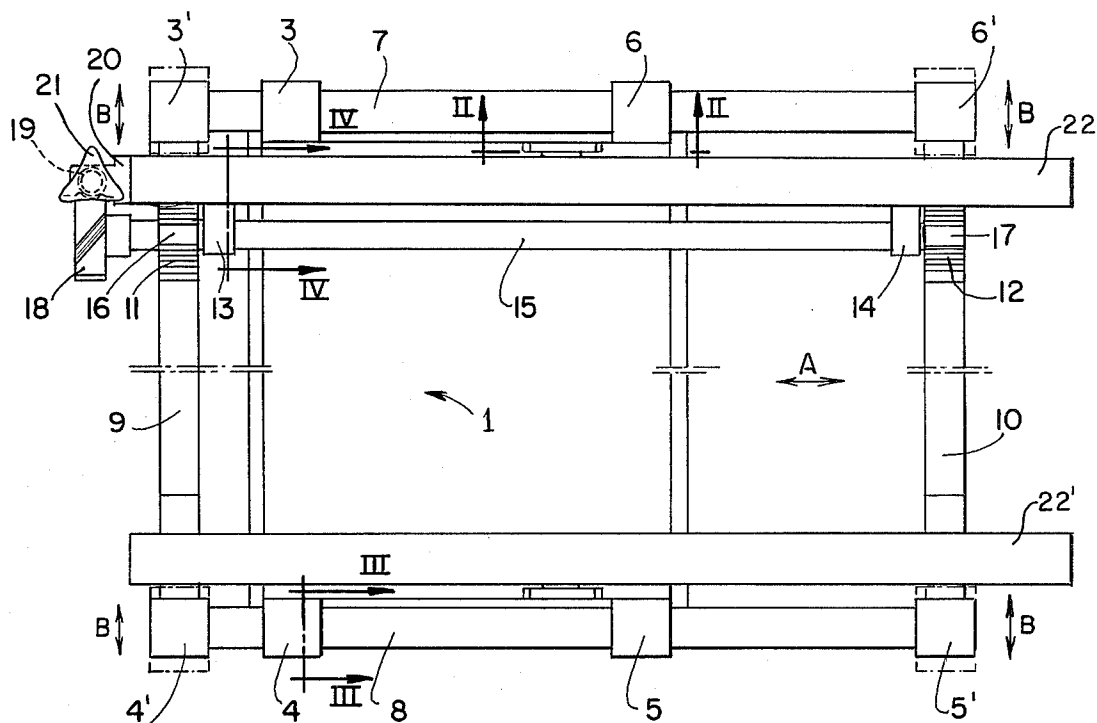


FIG. 1

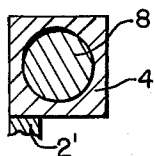


FIG. 3

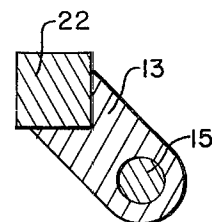


FIG. 4

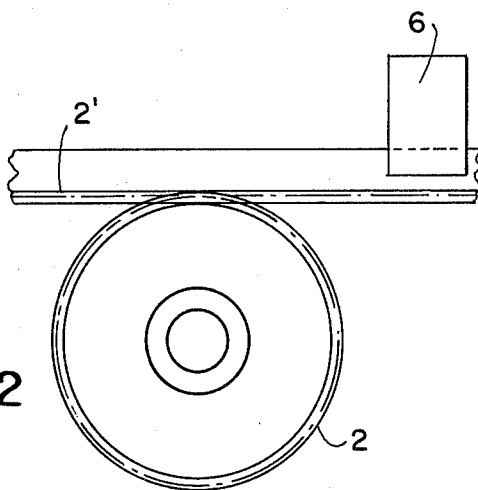


FIG. 2

TRANSVERSE FRAME ADJUSTMENT MEANS FOR SILK SCREEN PRINTING APPARATUS

BACKGROUND OF THE INVENTION

This invention relates generally to silk screen printing machines particularly of the type used to apply impressions on a paper strip or web, and more particularly provides a structure for transversely adjusting the position of the printing frame of said machine during the printing operation to obtain proper registration.

In silk screen printing machines, it becomes necessary to adjust the printing frame in the transverse direction before performing the printing operation. This is made necessary in order to obtain proper registration. At the present time, available devices do not meet the present needs of the serigraphic technique in this field. Accordingly, it is desired by the invention to provide a satisfactory transverse registration device for these purposes.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a plan view of a silk screen printing machine illustrating the transverse adjustment device according to the invention.

FIG. 2 is a partial sectional view of the device illustrated in FIG. 1 taken along lines II—II of FIG. 1 and on an enlarged scale.

FIG. 3 is a partial sectional view taken along lines III—III of FIG. 1 and on an enlarged scale.

FIG. 4 is a partial sectional view of the device illustrated in FIG. 1 taken along lines IV—IV of FIG. 1 and on an enlarged scale.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to the drawing, in FIG. 1 the printing frame is designated generally by reference character 1 and is provided with a pair of lateral gear racks which are not visible in the Figure but indicated by reference character 2' in FIG. 2. The silk screen printing machine includes stationary portions 22 and 22'. The gear racks 2' are operated upon by pinion gears or sprockets 2 so that the frame 1 is translated or moved reciprocally in the direction indicated by the double-headed arrow A. The pinion gears or sprockets 2 are of a width sufficient to enable them to maintain their meshed relationship with the gear racks 2' when the frame is displaced transversely in effecting proper registration.

As illustrated in FIG. 1, the printing frame 1 is provided with projecting parts 3, 4, 5 and 6 exteriorly projecting from the frame. Each part 3, 4, 5 and 6 includes an eye or ring-like support, note FIG. 3, suitable to permit passage therethrough of guides 7 and 8 in slidable relation therewith. The guides 7 and 8 are spatially fixed parallel to each other longitudinally of the printing frame 1 with the printing frame received therebetween. Parts 3 and 6 of frame 1 are slidable on guide 7 and parts 4 and 5 of frame 1 are slidable on guide 8.

Each of the guides 7 and 8 terminate in end supports 3', 4', 5' and 6' in which there fit, in a right angle direction with respect to the guides 7 and 8 themselves, a pair of cross-pieces 9 and 10 respectively. The direction of movement of cross-pieces 9 and 10 is indicated by double-headed arrows B. Each cross-piece 9 and 10 includes a segment carrying gear rack formations 11 and 12 respectively.

The stationary portion 22 of the machine is provided with a pair of inwardly directed arms 13 and 14 each

of which terminate in an eye or ring-like support, note FIG. 4. A small shaft 15 is supported in the eyes of arms 13 and 14 and is rotatable, but not transversable in the direction of double-headed arrows A, and is arranged parallel to the direction of motion (A) of the printing frame. The shaft 15 carries keyed thereupon a pair of pinion gears or sprockets 16 and 17, which are in meshing engagement with the gear racks 11 and 12 respectively.

A helicoidal wheel or worm gear 18 is mounted to shaft 15 on the outside end thereof, beyond the pinion gear or sprocket 16. The helicoidal wheel or worm gear 18 is in engagement with an endless screw 19, which is mounted vertically on bearing support 20 secured to the frame 1. The endless screw 19 is rotatable by means of control wheel 21 operable by hand, control wheel 21 forming one piece with said endless screw 19.

Manipulation of wheel 21 causes rotation of the endless screw 19 which causes the rotation of the helicoidal wheel 18, which rotates the shaft 15 causing movement of the guides 9 and 10 relative to shaft 15 in the transverse direction, indicated by double-headed arrows B and relative to the principal longitudinal movement of the frame 1 indicated by the double-headed arrow A. Thus the frame 1 is translated or displaced transversely toward the right and toward the left, thus registering it, by manipulating the control wheel 21.

Thus in summary, I have described means for effecting transverse registration of the frame, the frame being provided with lateral gear racks, cooperating with corresponding sprockets for its alternative longitudinal translation in two opposite directions. The frame is arranged slidably mounted on two longitudinal guides each one of said guides having their opposite extremities, provided with supports with right-angled or orthogonal axes relative to the axes of said guides. Two cross-pieces are engaged with said supports, each cross-piece being provided with a toothed rack segments 11 and 12. The machine member 22 furthermore is provided with two arms 13, 14 supporting a small shaft which is equipped with sprockets or pinion gears 16 and 17 cooperating respectively with the toothed segments 11 and 12.

At one end of shaft 15 is keyed a helicoidal wheel 18 which engages an endless screw 19. Screw 19 is arranged with its axis of rotation vertically oriented relative to the axis of rotation of worm gear 18. The screw is braced by the support 20 fastened on the frame. The endless screw 19 is rotated by manipulation of control wheel 21 fastened to the end of said screw 19.

What I claim is:

1. In a silk screen printing machine which includes a printing frame movable in a reciprocating operating direction and required to be registered transversely of said operating direction and first rack and pinion means coupled to said printing frame for effecting reciprocating longitudinal translation thereof in said operating direction; said frame being slidably mounted upon a pair of longitudinal arranged parallel first guides, each of said guides having supports at their extremities, said supports having orthogonal axes relative to the first guides, second guides comprising a pair of parallel arranged cross-pieces, each extending between and engaged with the supports at a common extremity of said first guides along said orthogonal axes respectively, said machine having a pair of arms fixed thereto and disposed inwardly of said frame and adjacent to op-

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posite edges thereof and having an elongate shaft supported between said arms, means to rotate said shaft from a single location therealong, second rack and pinion means coupling each of said cross-pieces and said shaft at the opposite ends of said shaft to enable both cross-pieces and the printing frame to be moved in a direction transverse during operation of the frame in the operating direction to achieve said registration.

2. The apparatus as claimed in claim 1 in which the means to rotate said shaft comprises a helicoidal wheel secured to said elongate shaft at one end thereof, an endless screw threadably engaged with the helicoidal

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wheel, support means secured to said printing frame and bracing said endless screw so that the rotational axis of said screw is vertically oriented and a control wheel is secured to said endless screw coaxial therewith, manipulation of said control wheel capable of operating said endless screw in turn to rotate said helicoidal wheel thereby to rotate the shaft and the pinions thereby to cause transverse movement of the rack portion of each of the cross-pieces so as to move the frame in a transverse direction.

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