June 10, 1952 H. T. BACKHOUSE 2,599,602

MECHANISM FOR REGISTERING SHEETS

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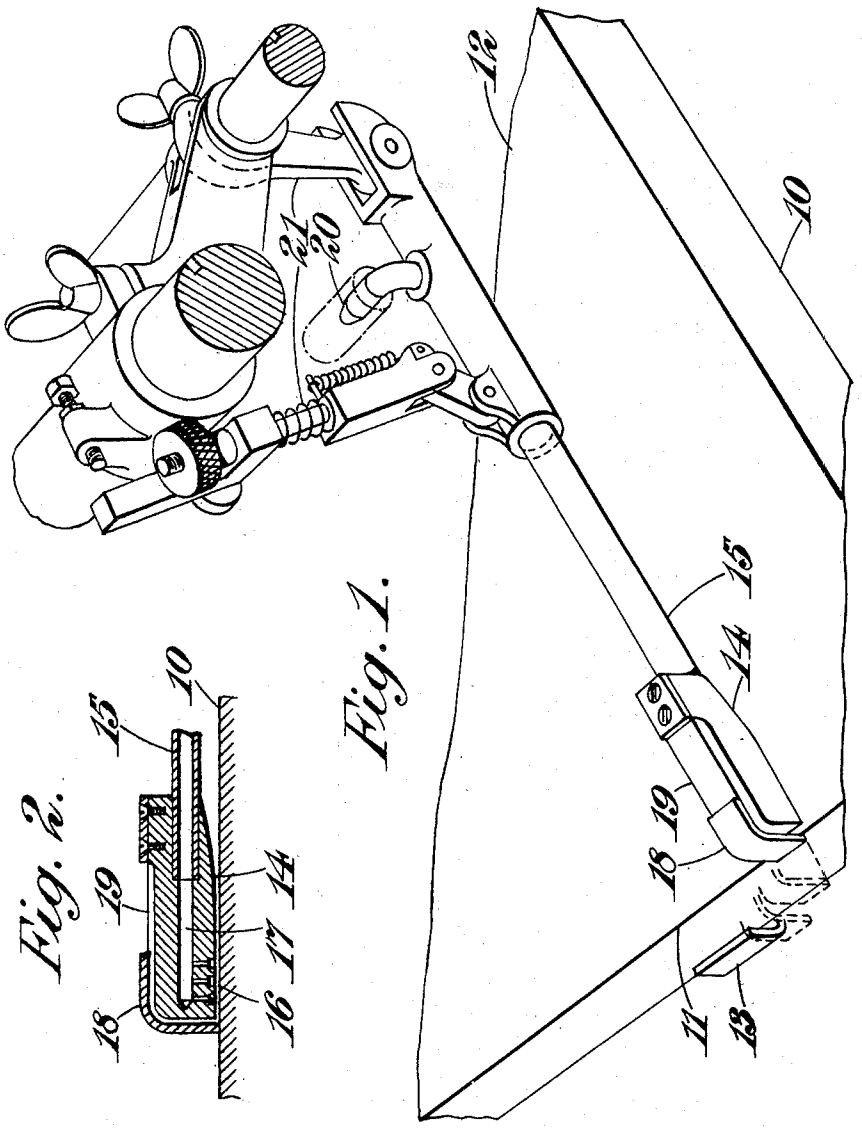


Fig. 1.

Fig. 2.

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MECHANISM FOR REGISTERING SHEETS

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1 Claim. (Cl. 271—60)

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This invention comprises improvements in or relating to mechanism for registering sheets being fed to printing presses and other machines.

The invention relates to sheet registering mechanism of the type (hereinafter referred to as the type described) comprising a layboard, means such as a tape conveyor for feeding the sheets over the layboard, one or more lays against which the front edge of each sheet in turn is fed to register the position of the sheet before it is taken by the printing press or other machine, and suction grippers (acting as smoothers) operating above the layboard and arranged to grip the upper surface of each leading sheet and to move with it up to the front lays.

The purpose of the suction grippers in mechanism of the type described is to overcome the difficulty, which sometimes arises when such grippers are not employed, particularly when sheets are being conveyed at high speed, that the leading sheet may arrive for registration at the front lays a little too early or too late in relation to the timed cycle of operations. In the former case the sheet may buckle and spring back from the front lays and in the latter case the sheet may be taken by the grippers or equivalent devices of the printing press or other machine before there has been time to effect registration between the front edge of the sheet and the lays. In both cases inaccuracies in registration may result.

According to the present invention suction grippers operating above the layboard and acting as smoothers are used in conjunction with preliminary sheet stops which travel with the grippers toward the front lays.

The invention accordingly consists in sheet registering mechanism of the type described characterised by preliminary sheet stops operating above the layboard and arranged to travel with the suction gripper elements towards the front lays of the printing press or other machine to effect a preliminary registration of the sheets while they are gripped by the suction gripper elements.

An example according to the invention will now be described with reference to the accompanying drawings (partly diagrammatic) in which:

Figure 1 is a perspective view (with parts broken away for the sake of clearness) showing the essential elements of the apparatus, and

Figure 2 is a longitudinal cross-section of a combined suction smoother element and preliminary sheet stop.

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Like reference numerals indicate like parts in both figures.

In this example there are two suction grippers (of which only one is shown in the drawings) spaced apart across a layboard 10 at positions to engage the leading edge 11 of each sheet 12 as it approaches the front lays 13 (only one of which is shown in the drawings) which are positioned at the forward end of the layboard 10 and are operable in usual manner. Each gripper is constituted by a box-like element 14 carried at the end of a forwardly-extending tubular arm 15 located above the layboard. Each gripper 14 is provided with a multiple point suction mouth 16 communicating by an interior conduit 17 with the bore of the tubular arm 15. Each preliminary sheet stop—one being associated with each gripper 14—is in the form of an angle-shaped finger 18 carried by a spring blade 19 from the inner end of the suction box 14. Suction is applied to the tube 15 by a nozzle 20. The arms 15 with their associated suction grippers and preliminary sheet stops are adapted to be reciprocated longitudinally and to be elevated and lowered in relation to the layboard by means of any convenient mechanism indicated generally by the reference numeral 21 in Figure 1, the movement of the arms being in synchronism with the main cycle of operations of the machine.

The apparatus described above may be operated in the following manner. Suction is applied at the mouths 16 before the leading sheet has reached these mouths. The effect of this is to apply a brake to the travel of the sheet so that it does not become crowded up against the preliminary stops 18 but is smoothly arrested by the preliminary stops in a "squared up" position. The mechanism 21 then operates to forward the grippers 14, suction being maintained until the front edge of the sheet reaches and is arrested by the front lays 13 of the machine. At this point the suction is cut off or reduced so that the sheet is left at the front lays while the stops and grippers slide off the sheet. Thereafter the mechanism 21 operates to lift the combined suckers and preliminary stops—leaving the sheet clear to be taken into the press—and to return them to their initial position ready to engage the next sheet.

In an alternative method of operating the apparatus, the combined suckers and preliminary stops are arranged to be moving towards the press lays 13 at a lower speed than the sheets are advanced by the main conveyor. The leading sheet then overtakes the combined suckers

and preliminary stops and is "squared up" to these stops while moving to the press lays.

I claim:

In a sheet feeder a feed board, a sucker arm, a sucker at the forward end thereof having a plurality of suction orifices longitudinally spaced apart in the direction of sheet travel over the feed board, means pivotally connected with the rear end of said arm for moving the sucker back and forth in the direction of sheet travel and means for raising the sucker while a sheet is being withdrawn from the feed board, the sucker being arranged to rest on a sheet on the board and with suction applied to the orifices during its forward travel and a sheet stop arranged to travel with the sucker and slightly ahead thereof in the direction of sheet travel whereby the forward edge portion of a sheet admitted between the sucker and the board will be gradually slowed down by suction as the forward edge of the sheet successively closes the suction orifices and by relatively slow forward movement of the sucker and the forward edge will be positively arrested and precisely positioned relatively to the sucker by engagement with the sheet stop.

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