March 19, 1929. G. SPIESS 1,705,505

APPARATUS FOR FEEDING FOLDED OR UNFOLDED SHEETS TO A PRINTING, FOLDING, OR OTHER MACHINE

Filed Dec. 1, 1926 3 Sheets-Sheet 1

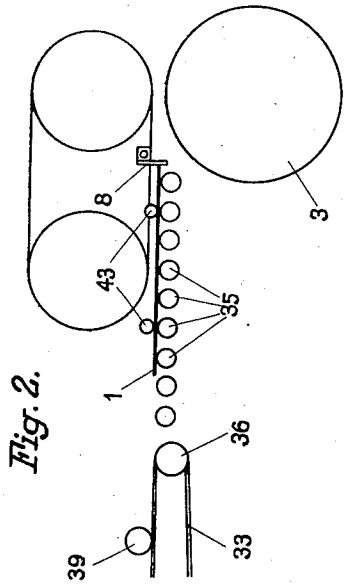


Fig. 2.

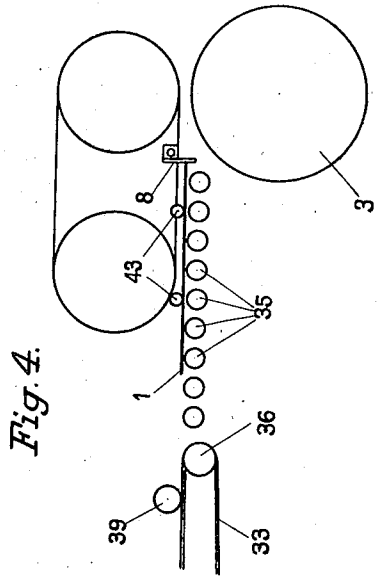


Fig. 4.

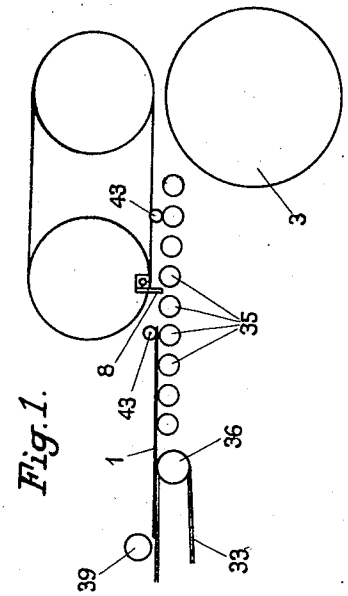


Fig. 1.

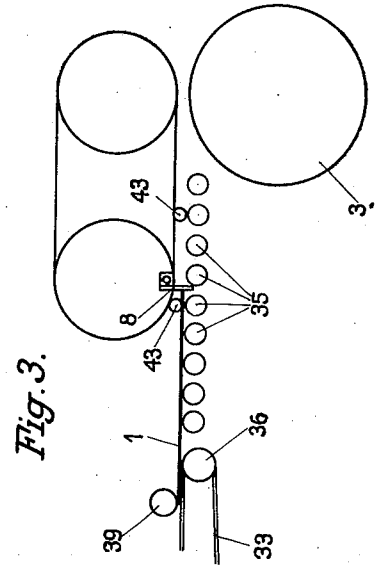


Fig. 3.

Inventor:
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APPARATUS FOR FEEDING FOLDED OR UNFOLDED SHEETS TO A PRINTING, FOLDING, OR OTHER MACHINE

Filed Dec. 1, 1926 3 Sheets-Sheet 2

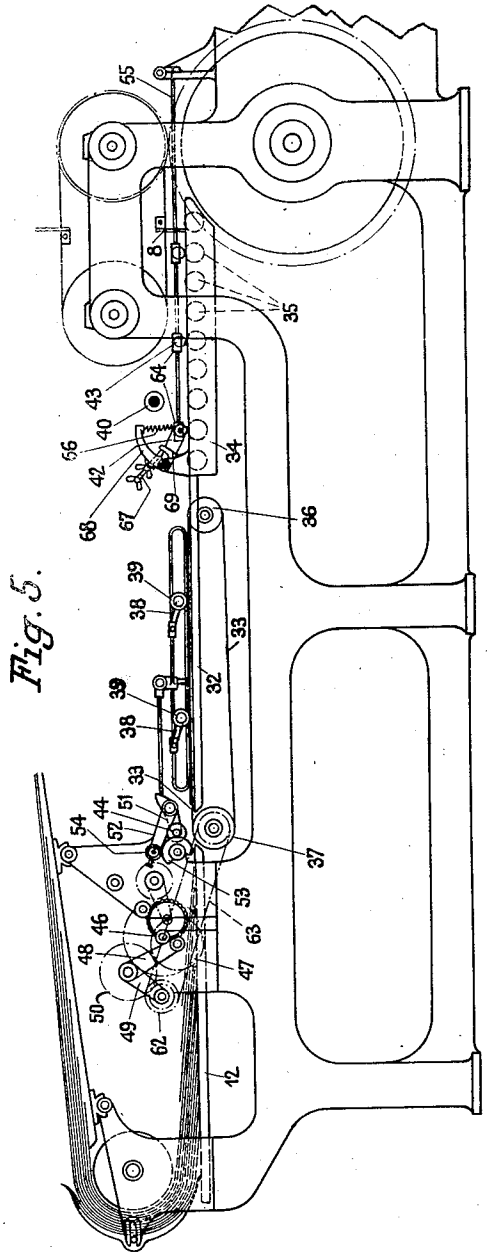


Fig. 5.

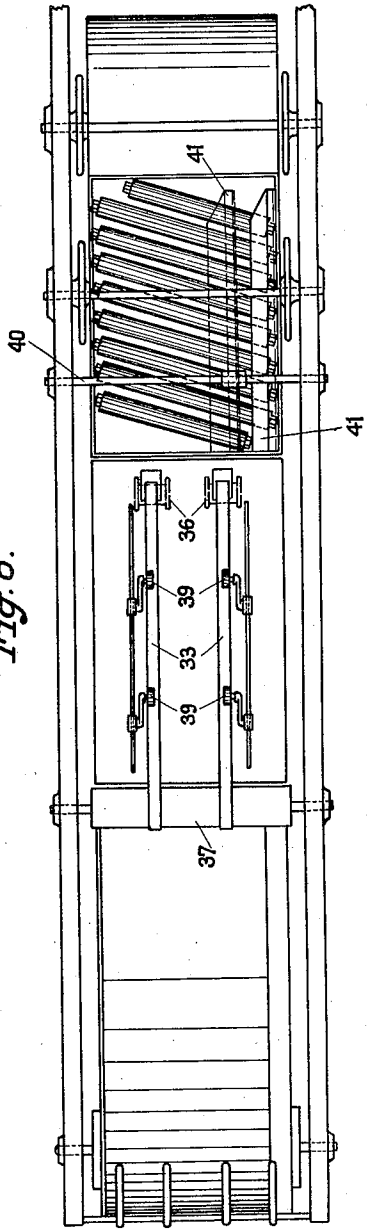


Fig. 6.

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March 19, 1929. G. SPIESS 1,705,505

APPARATUS FOR FEEDING FOLDED OR UNFOLDED SHEETS TO A PRINTING, FOLDING, OR OTHER MACHINE

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Fig. 7.

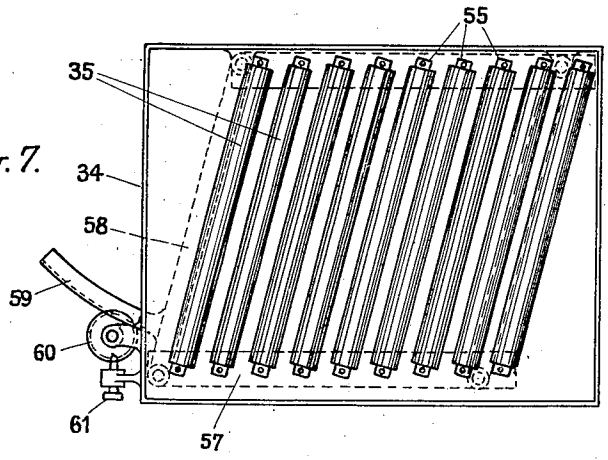


Fig. 9.

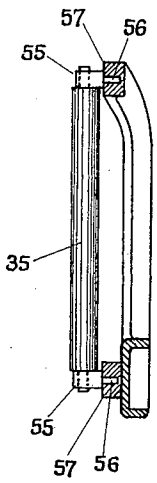


Fig. 8.

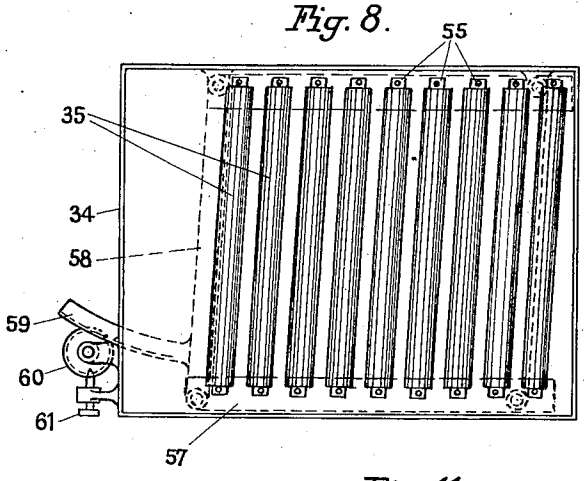


Fig. 10.

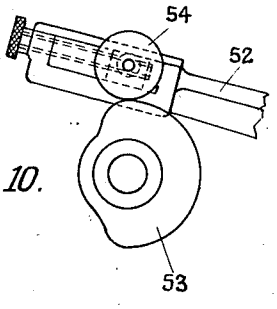
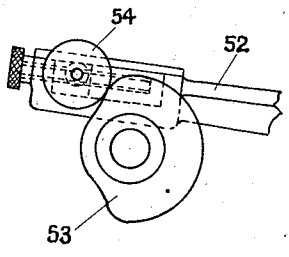


Fig. 11.



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Patented Mar. 19, 1929. 1,705,505

UNITED STATES PATENT OFFICE.

GEORG SPIESS, OF LEIPZIG-PLAGWITZ, GERMANY.

APPARATUS FOR FEEDING FOLDED OR UNFOLDED SHEETS TO A PRINTING, FOLDING, OR OTHER MACHINE.

Application filed December 1, 1926, Serial No. 151,897, and in Germany December 9, 1925.

The invention is an improvement in, or modification of, the invention claimed in the specification filed with my application Ser. No. 141,272 of October 13, 1926 which relates to the feeding of flat or folded sheets, from a pile to a machine, such as a printing press, folding machine or the like, the said specification describing a method whereby the sheets are aligned or registered in course of being fed to the machine and are delivered to said machine without stoppage. For this purpose the sheets must have some freedom of movement in relation to the feed devices which engage them. According to my present invention the arrangement is so made that the sheets are positively engaged during the greater part of their travel from the pile table to the fed machine, and are only released for lateral alignment a short distance in front of the machine. This enables a large output to be obtained by feeding at very high speed without loss of accuracy and regularity.

The feed may be so regulated that the positive engagement of the sheets stops when the sheets have reached, or almost reached, the movable and adjustable front edge aligning stops on the machine, but while the alignment takes place a certain pressure may be maintained on the sheet, which retains it in its general position without preventing such movement or deflection as is required for securing alignment.

The invention is illustrated by way of example in the annexed drawings, in which Figs. 1 to 4 are diagrams illustrating the method in a general way.

Figs. 5 to 11 show an example of apparatus according to the invention.

Fig. 5 being an elevation.

Fig. 6 a plan view, and

Figs. 7 to 11 being detail views.

In Figs. 1 to 4 the sheet is designated 1, and is fed along a feed track towards a gripping roller 3, for example the intake roller of a rotary press. The feed track includes a conveyor belt 33 working on a roller 36, and a series of rollers 35 forming a feed table. The conveyor receives the sheet from the pile. While on the feed table the sheet is moved against the travelling aligning members or gage fingers 8 for the front edge. Pressure rollers 39 hold the sheet against the belt 33. When the sheet has passed the last pressure roller 39 the greater part of the sheets is already on the forwarding rollers 35. The pressure rollers 39 may be so adjusted that they release the sheet when its front edge comes against the front aligning guides 8 (Fig. 3). The sheets may also be pressed on the feed rollers by means of arms having universally rotatable balls or pressure rollers, but obviously the pressure must be so light that the sheets are not prevented from performing aligning movements due to the rollers or aligning means.

The substantially positive engagement of the sheets by the conveyor belt and rollers 39 enables the feed movement to be accelerated and retarded alternately, as is known in connection with mechanical sheet feeding, the slow movement of the feed band occurring when the band receives a sheet and again when the front edge reaches the members 8 and slows down to their speed.

The apparatus (shown in Figs. 5 to 11) includes a pile table 12, a conveyor table 32, on which travels the feed band 33, and a roller frame 34 containing oblique feed rollers 35. The feed band 33 travels over rollers 36, 37, the roller 37 is driven by a shaft 46, to which is fixed an eccentric gear wheel 47 engaged with a planet wheel 50, the latter being connected to the axle of the wheel 47 by a link 48, and to the axle of a pinion 62 by a link 49. The pinion is driven by the gear wheel 50, and, drives the roller 37 by means of chain gear 63, with a speed which increases and decreases periodically. Rollers 39 supported by lever arms 38 rest on the feed band 33, in conjunction with which they engage the sheet. A lateral aligning rule 41 is adjustable by means of rods 40 above the roller frame 34. Balls 43 universally rotatable in cages or sockets 64 rest on the sheet on the roller frame 34, the cages 64 being adjustable on rods 65. The rods 65 are supported by pivoted arms 42 held down with regulatable pressure by springs 66 attached to pivoted arms 68, which are adjustable by means of screws 67 screwed into brackets 69.

The sheet separated from the pile is gripped between the feed roller 37 and a contact roller 44, and is moved forwards by the feed band 33, passing under the successive rollers 39 without lateral deflection. The sheet reaches the aligning guides 8 at about the same time as it is released by the last roller 39, and during its further travel the sheet is guided by the guides 8 and feed rollers 35. By the latter the sheet is urged

laterally towards the lateral aligning guide 41, the requisite deflection being allowed by the balls 43.

Rolls 35 are peripherally grooved or formed of disks spaced apart to permit gages 8 to move over said rolls without striking the same.

The contact rollers 44 are raised and lowered alternately by means of a lever 51, 52 and a cam 53. A roller 54 resting on the cam 53 carried by the lever arm 52 is adjustable in a slot in the lever so that the timing of the lowering of the rollers 44 onto the roller 37 or band 33 can be regulated together with the arrival of the sheets against the aligning guides 8.

The rollers 35 are adjustable in their frame so that they can be given varying angles of inclination to the general direction of feed. For this purpose the bearings 55 of the roller journals are rotatable about vertical pivots 56. The pivots on one side are fixed in the frame, but the support 37 for the pivots of the bearings on the other side is movable in a direction parallel to the opposite side of the frame by means of parallel links 58. One link 58 is provided with a toothed segment 59, whose teeth engage a toothed wheel 60, which is rotatable on the roller frame 34 and is provided with a hand wheel, crank or the like. A pin 61 enables the toothed wheel 60 to be fixed in position and so also the rollers 35. This arrangement enables the rate of feeding due to the inclined rollers to be varied.

Having thus fully described my invention, I claim:

1. Apparatus for feeding sheets from a supply source to a printing, folding or other machine comprising in combination, sheet separating means, and means for feeding and registering the sheets in the course of the feed movement, said feeding and registering means embodying variably driven feed elements for positively feeding forward the sheets delivered from the pile table and a feed mechanism having feeding and aligning means for aligning the sheets during their further movement towards the machine.

2. Apparatus as claimed in claim 1, having variably driven positive feed rollers.

3. Apparatus as claimed in claim 1 wherein the rollers whereby the aligning of the sheets is effected, are provided with pressing means for pressing the sheets against the feeding rollers.

4. Apparatus as claimed in claim 1 embodying rollers whereby the aligning of the sheets is effected, pressure rollers for pressing the sheets against the first-named rollers, and means controlling the action of the feed rollers whereby the feed can be advanced or retarded at will.

5. Apparatus as claimed in claim 1, wherein the feed rollers of the aligning portion of the feed track are adjustable for guiding the sheets in more or less inclined direction against a lateral guide.

6. Apparatus as claimed in claim 1, wherein the feed rollers of the feeding and registering means are obliquely arranged and connected to bearings rotatable about vertical pins and wherein a support, in which the bearings on one side of the roller table are arranged is oscillatable in a direction parallel with the bearings on the other side.

7. Apparatus for feeding sheets from a supply source to a printing, folding or other machine, comprising, in combination, sheet separating means, a feed mechanism for feeding and laterally alining the sheet for delivery, and feeding means for positively feeding the sheet between said separating means and said feed mechanism.

In witness whereof I have hereunto set my hand.

GEORG SPIESS.