

July 12, 1955

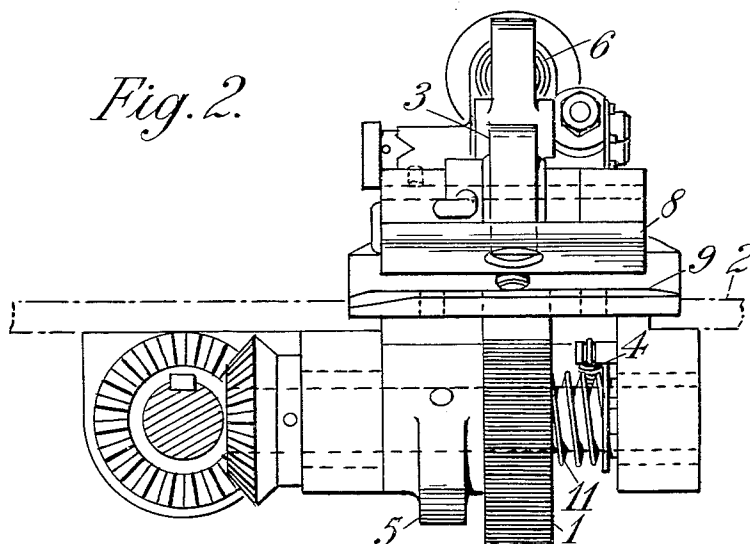
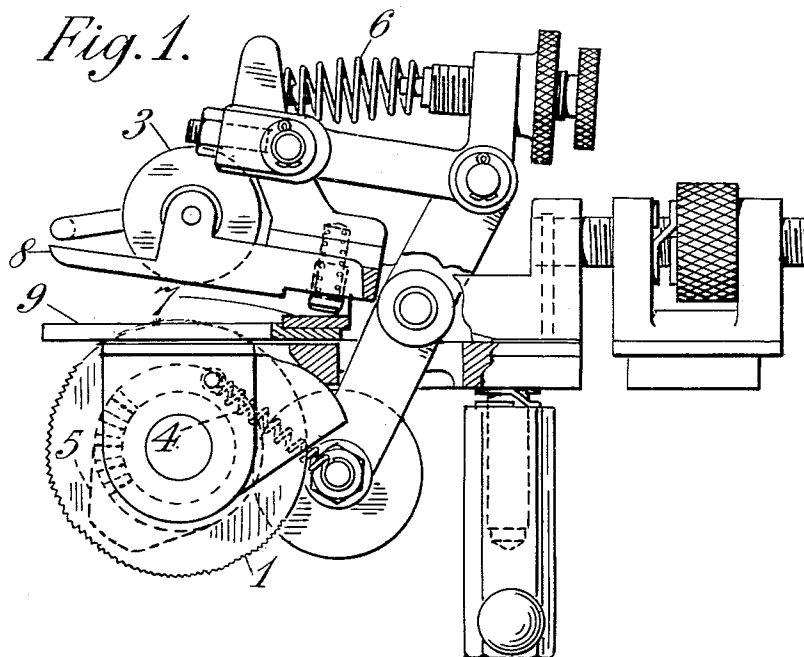
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2,712,936

SHEET REGISTERING MECHANISMS

Filed May 8, 1951

2 Sheets-Sheet 1



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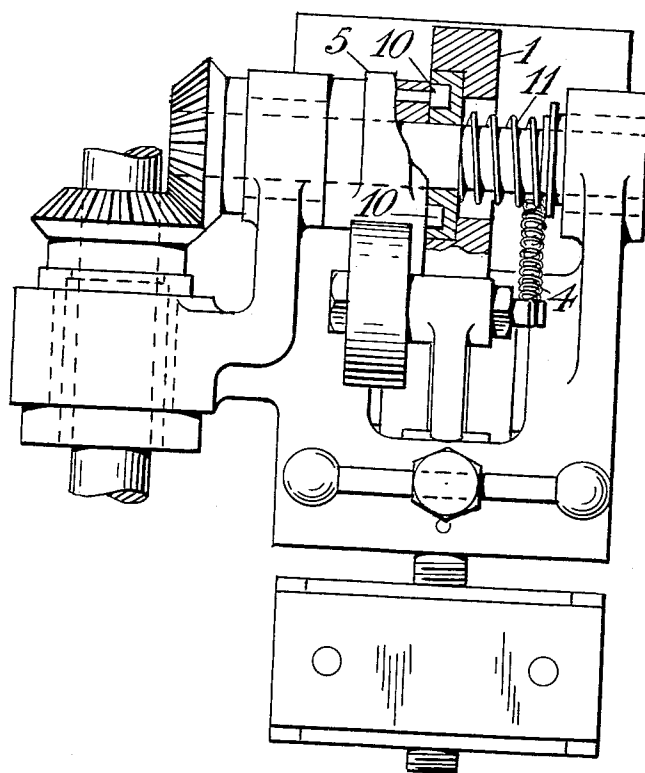
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2 Sheets-Sheet 2

Fig. 3.



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SHEET REGISTERING MECHANISMS

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7 Claims. (Cl. 271—59)

The invention relates to sheet registering mechanism of the kind (herein referred to as the kind described) in which individual sheets to be registered in position are each fed up to a registering stop or lay engaging an edge of the sheet, by means of a rotatable friction wheel or roller gripping, under spring, pneumatic or other pressure, the sheet against a companion wheel or roller or against a plate, blade or other member. Mechanisms of this kind are used, for example, in printing presses to obtain precise registration or individual sheets being fed to the press or in machines used to feed sheets to printing presses and like machines operating on single sheets. Such a feeding machine may be used in conjunction with or form part of a machine for separating the sheets from a pile and the feeding machine may comprise a feed or layboard and a conveyor (e. g. a tape conveyor) for feeding the sheets on to the layboard either as individual sheets or as a stream of partly overlapping sheets, the registration of the sheets being effected on the layboard. The sheet registering mechanism with which the invention is concerned may be used in such machines for effecting side registration of the sheets, the sheets being drawn laterally up to the stop or lay.

Frequently, in sheet registering devices of the kind described the spring or other pressure applying means is made adjustable in order that an appropriate frictional grip may be taken of different types of sheets (for example thin paper or stiff card). It is found in practice that there are mechanical disadvantages when such sheet registering mechanisms are required to handle types of card requiring the maximum frictional grip. It is the object of the invention to provide a means, without such mechanical disadvantages, of obtaining frictional grip of an adjustable nature which means may or may not be combined with the adjustment of the spring pressure.

The invention consists in a sheet registering mechanism of the kind described in which only a part of the circumference of the wheel or roller is employed in each operation to effect the feeding of the sheet up to the lay, in which the circumferential surface of the wheel or roller has circumferentially distributed parts of different frictional characteristics suited to the gripping of sheets of different types and in which the part employed to effect the feeding of the sheets may, by a simple adjustment, be varied.

A specific construction of side lay mechanism embodying the invention will now be described by way of example and with reference to the drawings in which:

Figure 1 is a side view, partly in section, of the mechanism,

Figure 2 is a front view of the mechanism, and

Figure 3 is an under plan of the mechanism.

The mechanism forming the subject of this example is for use in effecting side registration against a side lay of sheets to be fed to a printing machine. In the mechanism the friction wheel or roller 1 is located below a layboard 2 and cooperates with a companion wheel or roller 3 positioned on the same vertical line, above the

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layboard. The wheels are separable by means of a tension spring 4 under the control of a cam 5 to permit the feeding of the sheets between the wheels and may be brought together by the cam 5, under pressure from compression spring 6 to grip the sheets. The registering surface of the side lay or registering stop 7 is parallel, or approximately parallel to the axes about which the two wheels or rollers revolve. There is provided above the layboard 2 a smoother plate 8 attached to the side lay and situated so that the sheets being drawn up to the lay are brought between such smoother plate and a plate 9 secured to the layboard 2 in such manner as to retain the sheets flat and eliminate any bending which would destroy the effect of side registering. Such smoother plate 8 has a slot through which the upper wheel 3 operates. The upper wheel 3 is mechanically lowered so as to cause the sheets to be gripped between its circumferential surface and that of the lower wheel 1, and this gripping action continues for between 35° to 50° of the movement of the lower wheel 1 as determined by the shape of the cam 5. The grip is removed by the raising of the upper wheel 3 at the end of the interval referred to in the previous sentence. During the time between which the edge of the sheet first comes into contact with the side lay and the relaxation of the grip, the smoother plate 8 causes that portion of the sheet adjacent to the side lay to be held flat and sufficiently rigid to cause the grip taken by the rollers 1 and 3, if suitably adjusted, to slip until it is relaxed by the raising of the upper wheel 3.

The lower wheel 1 which is of metal has its circumference divided into four quarters of different frictional characteristics. One quarter of the circumference is plain, another is roughened by sand blasting and the other two quarters are knurled in different degrees of roughness. The wheel 1 is in side by side relation with the aforesaid cam 5 which makes one revolution for each sheet and is driven from the cam or collar 5 by two diametrically opposed pins 10 on the cam 5 received in holes in the side face of the wheel 1. There are two pairs of holes in the wheel 1 at 90° spacings. The wheel is pressed against the cam 5 by a compression spring 11. The angular position of the wheel 1 in relation to the cam 5 is adjustable so that either the plain or any one of the roughened and knurled surfaces on the wheel is employed to grip the sheet and the surface which is used may readily be changed by withdrawing the wheel 1 from the driving pins 10, rotating it either clockwise or anti-clockwise through 90° or 180° and re-engaging it with the pins 10 so that the desired quarter is in the operative position.

The invention is not restricted to the constructional details set forth in the above example. For instance, the wheel 1 may be provided with different portions of its circumference constructed of different materials having different coefficients of friction. Again the wheel 1 need not be coupled to the cam 5 but there may be a collar on the operating shaft and the wheel 1 may be adjustably coupled to this collar by pins in the manner described above. Further it is not essential that the wheel 1 rotates. It may be given an oscillatory movement such that for any position of adjustment the same portion of the periphery is employed for each sheet.

I claim:

1. A sheet registering mechanism comprising a registering stop for engagement by a side edge of a sheet, a rotatable friction roller for frictional engagement with one face of a sheet to be registered, a support member for engagement with the other face of the sheet in opposed relation to the friction roller, driving means for positively imparting a rotational movement to the roller in a direction to feed the sheet to the stop, means operating in timed

relation to the rotational movement of the roller, for urging the roller and support member together to grip a sheet between them to hold them in sheet-gripping relation during less than one revolution of the roller and then to separate the roller and support member to release the sheet, in which mechanism the circumferential surface of the roller has circumferentially distributed parts of different frictional characteristics, the said parts being of substantially equal angular extent, the said driving means include a driving shaft and means for clutching the roller to the shaft at any one of a plurality of predetermined discrete angular positions relative thereto, the angular spacing between said positions being substantially equal to the angular extent of the respective said circumferentially distributed parts of the circumferential surface of the roller, whereby the part of the circumferential surface of the roller which engages the sheet in gripping relation as aforesaid may readily be changed to such as will enable slip between the roller and the sheet to occur when the sheet reaches the stop.

2. Sheet registering mechanism as claimed in claim 1, in which the support member is a second roller mounted for free rotation.

3. A sheet registering mechanism comprising a registering stop for engagement by a side edge of a sheet, a rotatable friction roller for frictional engagement with one face of a sheet to be registered, a support member for engagement with the other face of the sheet in opposed relation to the friction roller, driving means for positively imparting a rotational movement to the roller in a direction to feed the sheet to the stop, means operating in timed relation to the rotational movement of the roller, for urging the roller and support member together to grip a sheet between them to hold them in sheet-gripping relation during less than one revolution of the roller and then to separate the roller and support member to release the sheet, in which mechanism the circumferential surface of the roller has circumferentially distributed parts of different frictional characteristics, the said driving means include a driving member having a side face normal to the axis of rotation, the friction roller is in side by side relation to said face and there is at least one driving pin extending in the axial direction between the driving member and the roller and engageable in any one of a plurality of circumferentially spaced sockets in one of the two parts thereby to permit angular adjustment between the roller and the driving member, the angular spacing between the sockets being substantially equal to the angular extent of the respective said circumferentially distributed parts of the circumferential surface of the roller, whereby the part of the circumferential surface of the roller which engages the sheet in gripping relation as aforesaid may readily be changed to such as will enable slip between the roller and the sheet to occur when the sheet reaches the stop.

4. Sheet registering mechanism as claimed in claim 3 including a spring urging the roller and driving member into face to face relation.

5. A sheet registering mechanism comprising a registering stop for engagement by a side edge of a sheet, a rotatable friction roller for frictional engagement with one face of a sheet to be registered, a support member for engagement with the other face of the sheet in opposed relation to the friction roller, driving means for positively imparting a rotational movement to the roller in a direction to feed the sheet to the stop, means operating in timed relation to the rotational movement of the roller, for urging the roller and support member together to grip a sheet between them to hold them in sheet-gripping relation during less than one revolution of the roller and then to separate the roller and support member to release the sheet, in which mechanism the circumferential surface of the roller has circumferentially distributed parts of different frictional characteristics, the said parts being of substantially equal angular extent, the said driv-

ing means include a driving shaft and means for clutching the roller to the shaft at any one of a plurality of predetermined discrete angular positions relative thereto, the angular spacing between said positions being substantially equal to the angular extent of the respective said circumferentially distributed parts of the circumferential surface of the roller, whereby the part of the circumferential surface of the roller which engages the sheet in gripping relation as aforesaid may readily be changed to such as will enable slip between the roller and the sheet to occur when the sheet reaches the stop, the said angular extent of each said part of the circumferential surface of the roller being at least as large as the angle through which the roller rotates while the roller and support member are urged together as aforesaid, and the said parts being located on the roller so that only a selected one of them is brought into sheet engaging position while the roller and support member are urged together as aforesaid.

6. A sheet registering mechanism comprising a registering stop for engagement by a side edge of a sheet, a rotatable friction roller for frictional engagement with one face of a sheet to be registered, a support member for engagement with the other face of the sheet in opposed relation to the friction roller, driving means for positively imparting a rotational movement to the roller in a direction to feed the sheet to the stop, means operating in timed relation to the rotational movement of the roller, for urging the roller and support member together to grip a sheet between them to hold them in sheet-gripping relation during less than one revolution of the roller and then to separate the roller and support member to release the sheet, in which mechanism the circumferential surface of the roller has circumferentially distributed parts of different frictional characteristics, the said driving means include a driving member having a side face normal to the axis of rotation, the friction roller is in side by side relation to said face and there is at least one driving pin extending in the axial direction between the driving member and the roller and engageable in any one of a plurality of circumferentially spaced sockets in one of the two parts thereby to permit angular adjustment between the roller and the driving member, the angular spacing between the sockets being substantially equal to the angular extent of the respective said circumferentially distributed parts of the circumferential surface of the roller, whereby the part of the circumferential surface of the roller which engages the sheet in gripping relation as aforesaid may readily be changed to such as will enable slip between the roller and the sheet to occur when the sheet reaches the stop, the said angular extent of each said part of the circumferential surface of the roller being at least as large as the angle through which the roller rotates while the roller and support member are urged together as aforesaid, and the said parts being located on the roller so that only a selected one of them is brought into sheet engaging position while the roller and support member are urged together as aforesaid.

7. Sheet registering mechanism as claimed in claim 6, including a spring urging the roller and driving member into face to face relation.

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