

July 16, 1940.

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2,208,048

REGISTER MECHANISM

Original Filed Jan. 10, 1938

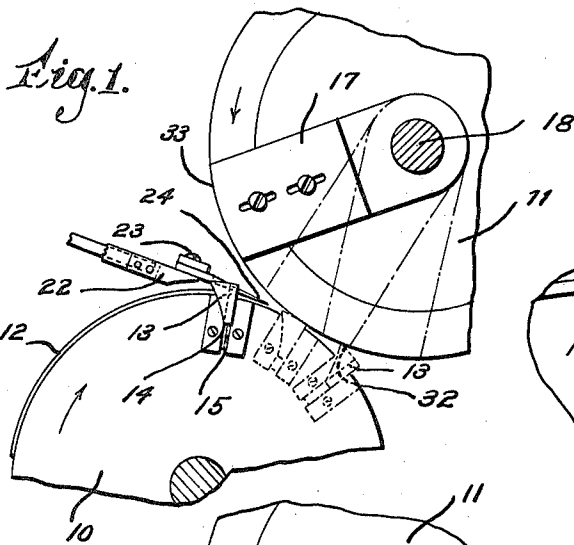
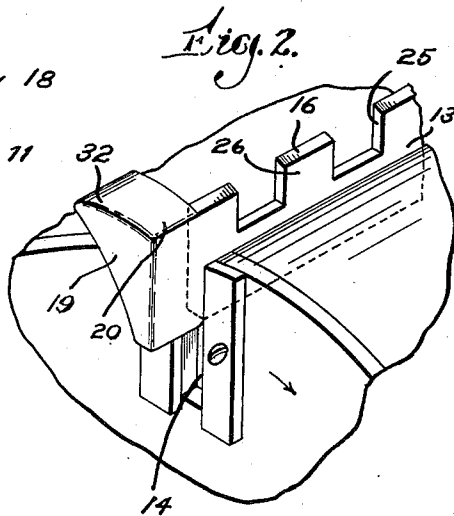
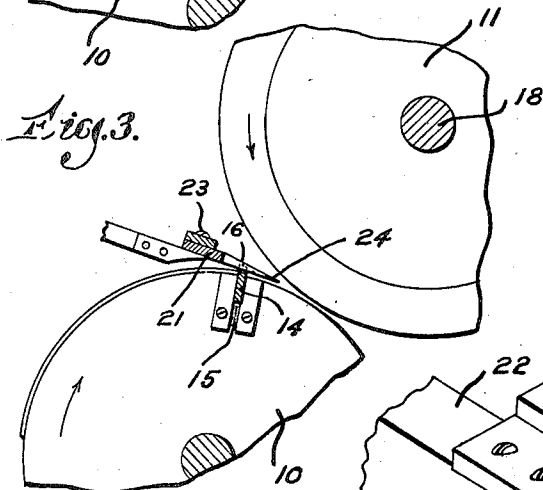
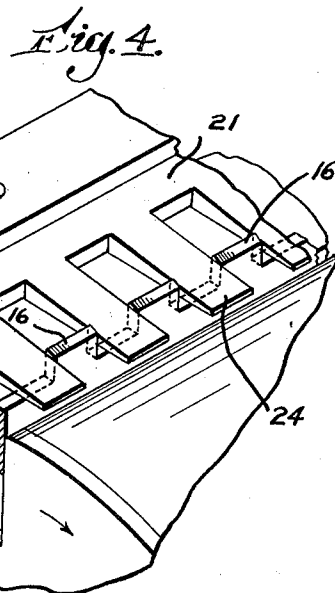
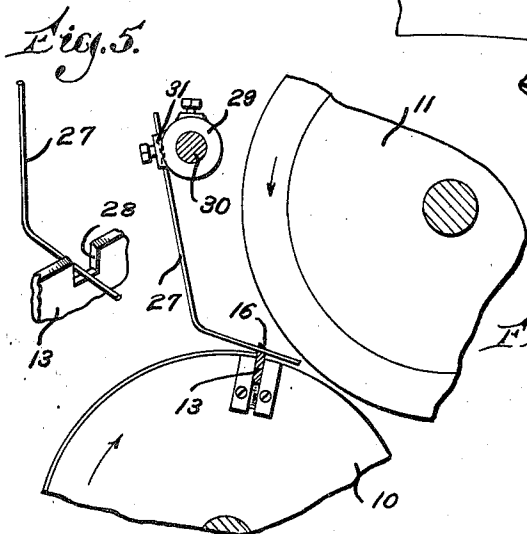


Fig. 6.

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2,208,048

REGISTER MECHANISM

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Refiled for abandoned application Serial No.
184,349, January 10, 1938. This application
November 13, 1939, Serial No. 304,185

10 Claims. (Cl. 271—53)

This invention relates to register mechanism and more especially to register mechanism for guiding sheets of material between rolls. Its objects are to improve register mechanism for guiding envelopes, sheets, or like material with printing or other types of rolls particularly at high speeds; to effect such register on one of the rolls while it is rotating and to maintain the register up to the point at which the subject matter is engaged by the nip of the rolls; to prevent excess ink being picked up when the register mechanism is used with printing rolls; and to provide simple and efficient mechanism for these purposes which will properly pass sheets of material of varying thicknesses and of varying degrees of smoothness.

The invention comprises means and combinations suitable for accomplishing the foregoing objects as explained in the following specification, and includes not only the specific embodiment so described but all substantial equivalents thereof within the scope of the appended claims. This application is refiled for abandoned application Serial No. 184,349, filed January 10, 1938.

In the accompanying drawing:

Fig. 1 is a fragmentary view in end elevation illustrating rolls and the register mechanism of the invention associated therewith.

Fig. 2 is a view showing in detail perspective a portion of the lower roll shown in Fig. 1 and illustrating a roll and guide plate construction of the invention.

Fig. 3 is a view in cross section illustrating the guide plate and roll construction.

Fig. 4 is another detail perspective view showing the complete register mechanism in engaging position with a roll.

Fig. 5 is a detail perspective view illustrating modified register means; and

Fig. 6 is a fragmentary elevational view illustrating the modified register means shown in Fig. 5.

Referring in detail to the drawing, 10 and 11 indicate rolls which have been partly broken away. They are intended to be illustrative of any type of rolls which have their peripheries in rolling contact for the purpose of performing work on subject matter passed therebetween. As one example there may be cited printing rolls, and while other roll operations where register of subject matter is pertinent are included within the scope of this invention, the following description of register means will be presented, having in mind particularly printing rolls.

In Fig. 1, therefore, roll 11 may comprise a

transfer roll of the well known type used in offset printing and roll 10 may comprise a plate roll for presenting work against the transfer. 12 indicates a pressure plate solidly mounted on roll 10 and being located such that its forward edge coincides with the forward edge of offset printed matter occurring on roll 11 when the rolls are rotating in the direction of the arrows shown in Fig. 1.

Adjacent the forward edge of pressure plate 12 in roll 10 I have provided a guide plate 13, being resiliently received in a slot 14 against a spring 15. The normal position of guide plate 13 is the fully extended one shown in Fig. 2 whereby there is provided an edge for aligning subject matter delivered on to the pressure plate 12 by feeding mechanism forming no part of the present invention.

Guide 13 may comprise a solid strip extending all the way across roll 10 or it may have a transversely cut opening or openings located there-through for purposes described hereafter.

At one end of shaft 18 is mounted a cam 17 for depressing guide 13. Cooperating with cam 17 there may be provided a cam block 19, either formed as a part of the guide plate 14 or separately secured at the end thereof, having a face 20 adapted to be contacted by cam 17 and depress the plate thereby.

In effecting alignment and registration of subject matter on the plate 12 against the guiding edge 13, difficulty arises from the forward edge of the subject matter having a tendency to ride upwardly against the guide plate, partly owing to the curved surface of the pressure plate and partly due to irregularities occurring in the sheets of material, having in mind particularly envelopes although such irregularities may occur with other types of material, as for instance cards or other sheets of uneven thickness. If the forward edge of the subject matter is not maintained flatly against the pressure plate, as well as in alignment with the guiding plate edge, the nip of the rolls may engage first with those portions which are slightly upstanding and a blurring or wiping effect occurs, which is highly undesirable.

During the period when the guide plate first contacts the transfer roll and depressing of the plate begins, up until the plate is completely depressed at the nip, it is difficult to maintain subject matter flatly against the pressure plate and it becomes increasingly so where a positive pressure feed is utilized to urge the material against the guide plate since the curve of the pressure plate falls away from the direction of the feed-

ing force on continued rotation, the subject matter tending as a result to ride up on the guide plate.

To overcome this difficulty I have provided means for maintaining the forward edge of the subject matter flatly against the pressure plate while the guide plate is being depressed. As one example of such means I have provided a combining plate 21, which may be supported in any desirable manner such as by a transversely disposed strap 22 mounted in the frame of the machine. Plate 21 comprises a flat strip having forwardly extending tips 24 the upper sides of which are beveled to provide thin edges projecting inwardly to just adjacent the point at which the rolls nip and at which the guide plate is completely depressed. The under edges of the tips 24 have been shown straight but may if desired be given a slight curve to correspond with the rolls.

For receiving means such as the combining plate 21, the guide plate 13 may be formed with cut-out portions 25 more clearly shown in Figs. 2 and 4, which provide clearance for the projecting tips 24 when roll 19 rotates and guide plate 13 moves forwardly through the combining plate. As a result of forming the cut-out portions 25, there remain upstanding portions 26 which provide supports for the front edge of subject matter.

Another means of maintaining subject matter flatly on the pressure plate while the guide plate is being depressed has been illustrated in Figs. 5 and 6 of the drawing, and comprises clips 27 of which there may preferably be a plurality, they being received through the guide plate 13 by means of cut-out portions 28. The clips may be supported by means of sleeves 29 adjustably fixed to a shaft 30 extending in front of the rolls 19 and 11 with the sleeves being formed with lug portions 31 through which pass the upper ends of the clips.

By providing the mechanism above described, the advantage of maintaining all subject matter flatly against the pressure plate at substantially all times is secured, since the tips 24 extend through the cut-out guide plate, holding the subject matter down against the pressure plate as the pressure plate moves forwardly into engagement with the transfer blanket. The exact location of the tip extremity may best be determined by trial and preferably the extremity of the tip will be just adjacent the roll and in wiping contact with subject matter on the pressure plate just before it approaches the nip position. Since the guide plate necessarily is required to extend a substantial distance above the pressure plate to provide an edge, the point in its rotation at which it will be contacted by the transfer roll measured peripherally to the point of nip of the rolls, comprises a substantial distance through which the subject matter must pass, and the present means described effects substantial holding during this peripheral period.

It is pointed out that the efficient registration obtained is not limited in its scope to treatment of envelopes, sheets or like material or to offset printing, but is applicable to any roll operation where an accurate adjustment is required, and high speed roll operation is being carried on.

In those operations where printing ink or other wet materials are being applied to one of the rolls, and a guide plate similar to any of those referred to in this application is utilized, there is further difficulty arising from the tendency of the guide

plate to spring outward immediately after having passed the nip of the rolls and to collect excess ink or other excess wet material which is undesirably deposited with the next succeeding rotation of the roll on the next unit of subject matter. More particularly is this the case where there is a tendency for ink or other material to bank or cake up on the front of the printing plate, which transfers to the transfer blanket.

I have provided means for eliminating such difficulties. For example, I may utilize the cam block 19 as illustrated in Fig. 2, and provide a rearwardly extending cam face portion 32, which is shaped in such manner that as it follows along the face 33 of cam 17, the guide plate is maintained in a depressed position until after it has been carried around to the point where the plate in its fully extended position will not contact the transfer roll. In Fig. 1 I have indicated in broken lines two positions of the cam 17 and cam face 32, showing the distance the roll must travel from the nip position to the position at which the plate 13 fully extended will not contact the roll 11. The relation of the several elements is most clearly shown in the broken line position occurring at the extreme right-hand side of Fig. 1. It is an advantage where delay in springing out of the guide plate is desired to construct the cam block 19 integrally with the guide plate, since by so doing, the face of the cam block performs two functions, namely, proper depressing of the guide plate without contact of the soft resilient blanket therewith, and holding down the guide plate after it passes the nip of the rolls. However, it is considered that this holding means may be used separately of the depressing action and may be applicable to various other purposes, particularly where high-speed operation is being carried on.

It will be seen that by the structure of the invention, an improved registration of subject matter fed to rolls is obtained, and improved operation of register mechanism is made available.

While I have shown preferred embodiments of the invention and specific application, it should be understood that various other forms may be resorted to and other applications carried out, as for example with other types of rolls than printing rolls, in keeping with the spirit of the invention as defined by the appended claims.

Having thus described my invention, I claim:

1. A register mechanism for passing envelopes, sheets or like materials to be printed from edge to edge, between rolls comprising a guide plate member resiliently mounted in one of said rolls, means for depressing said guide plate and means adapted to extend through said guide means and maintain the forward edge of the said sheets, or like materials to be printed, on the roll adjacent the guide plate until it reaches the nip of the said rolls.

2. A feeding mechanism for passing envelopes, sheets, or like materials to be printed from edge to edge between offset printing rolls comprising a guide plate member resiliently mounted in one of said rolls, a pressure plate member located adjacent the guide plate member on the periphery of the said first roll, means adapted to extend through the guide for engaging the front edge of the said sheets or like materials to be printed against said pressure plate and adjacent said guide plate while guide plate is being depressed.

3. A register mechanism for aligning envelopes, sheets or like materials between an upper roll

and a lower roll comprising a pressure plate member located on said lower roll, register means in said lower roll comprising a guiding edge located adjacent the front edge of said pressure plate said edge adapted to be depressed as it rolls into nip relation with the upper roll, and means extending beyond the guiding edge means, while the said edge is being depressed, for maintaining the front edge of sheets or like materials to be printed flatly against the pressure plate.

4. A register mechanism for passing envelopes, sheets or like materials to be printed from edge to edge between rolls, the rolls comprising in combination an upper roll and a lower roll, a pressure plate located on the periphery of the lower roll, a depressible guide plate located in said lower roll adjacent the front edge of said pressure plate, plate means located in front of said rolls, tips forming a part of the plate means extending to a point just in front of the nip of said rolls, said guide plate having openings provided therein forming clearance for said tips.

5. A register mechanism for passing envelopes, sheets or like materials to be printed from edge to edge, between rolls comprising a guide plate member located on one of said rolls and adapted to be depressed upon rotation of the other of said rolls, plate means having forwardly extending tips, said guide plate member provided with cut-out portions, said plate means being located such that its tip portions extend through the said cut-out portions in the guide plate when the guide plate is rolling towards the periphery of the upper roll.

6. A register mechanism for delivering envelopes, sheets, or like materials to be printed from edge to edge between two rolls, comprising a guide plate member resiliently mounted in one of said rolls and being located adjacent a pressure plate on said roll, plate means having forwardly extending tips located in front of the nip of said rolls, said guide plate provided with cut-out portions, said plate means being located such that its tips extend through the said cut-out portions

while the guide plate is approaching the periphery of the second roll and located such that the said tips are also in contact with subject matter on the said pressure plate.

7. A register mechanism for use in printing envelopes, sheets or like materials comprising in combination a pair of rolls, a pressure plate located on one of said rolls, said plate being in rolling contact with the other of said rolls, a guide plate member resiliently mounted at the front edge of the pressure plate in said first roll, means for depressing the guide plate below the peripheral level of the said pressure plate, means for maintaining said subject matter flatly against the pressure plate during the period in which said guide plate is depressed and means forming a part of said depressing means for delaying return of the guide plate to an outwardly extending position.

8. In a register mechanism for printing rolls, a guide plate member resiliently mounted in one of said rolls, means for depressing said guide plate as the guide plate approaches the nip of the rolls, and means for maintaining said guide plate in a depressed position after it has passed the nip of said rolls.

9. In a register mechanism for passing subject matter between rolls the combination, with an adjustable guide resiliently mounted in one of the rolls and having an extended cam member, of additional cam means for depressing said guide and an extension on the said additional cam means for engaging with the extended cam member and delaying return of the guide.

10. A register mechanism for passing sheets between rolls comprising a guide depressibly mounted in one of the rolls, means for depressing the guide and rod means supported in front of said rolls and adapted to extend through said guide in at least one position to maintain the front edges of said sheets against the roll supporting them.

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