Jan. 27, 1931. P. J. CHRISTMAN, JR 1,789,965

MECHANISM FOR SUPERIMPOSING SHEETS OF PAPER

Filed June 12, 1929 2 Sheets-Sheet 1

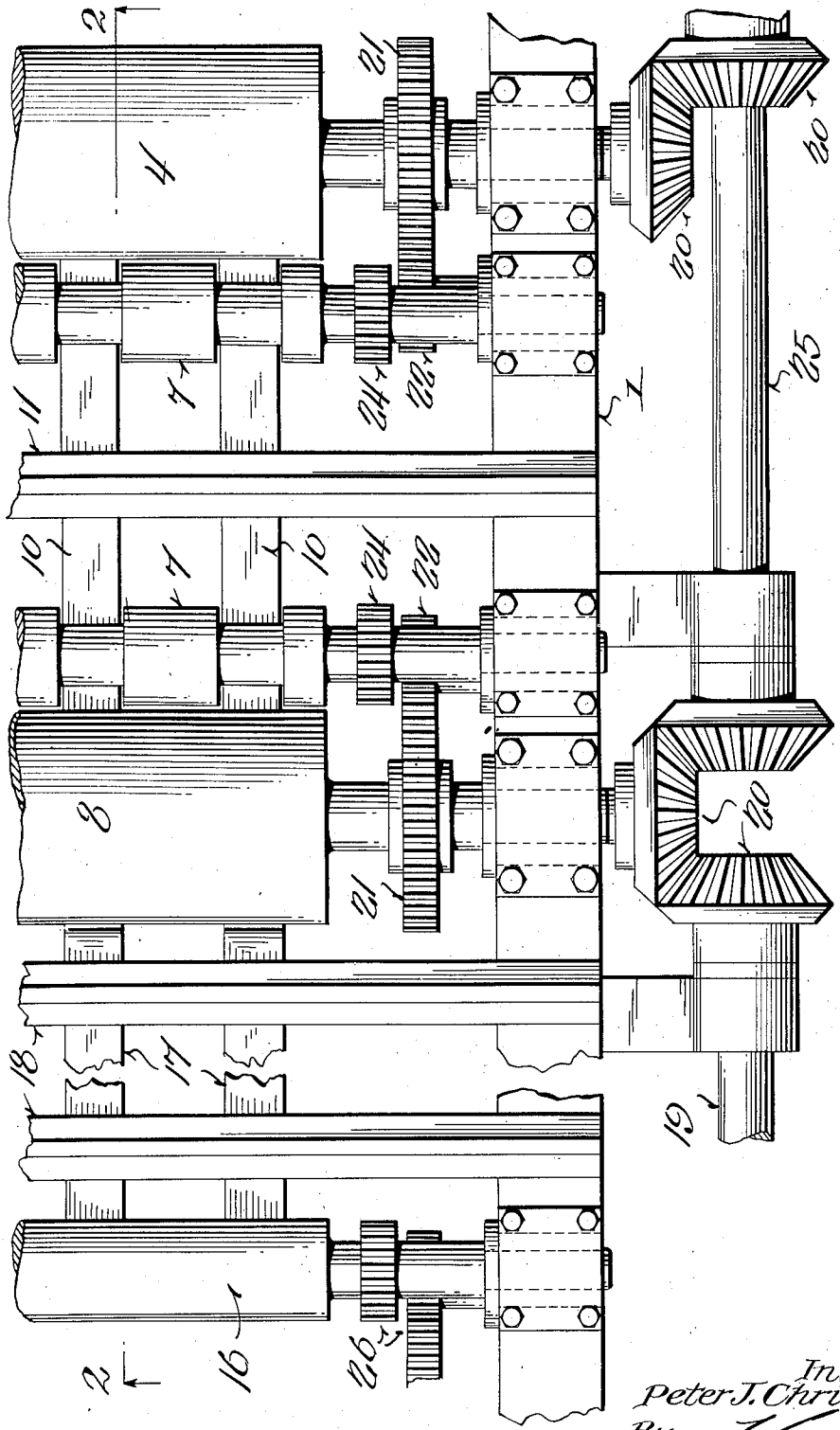


Fig. 1

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MECHANISM FOR SUPERIMPOSING SHEETS OF PAPER

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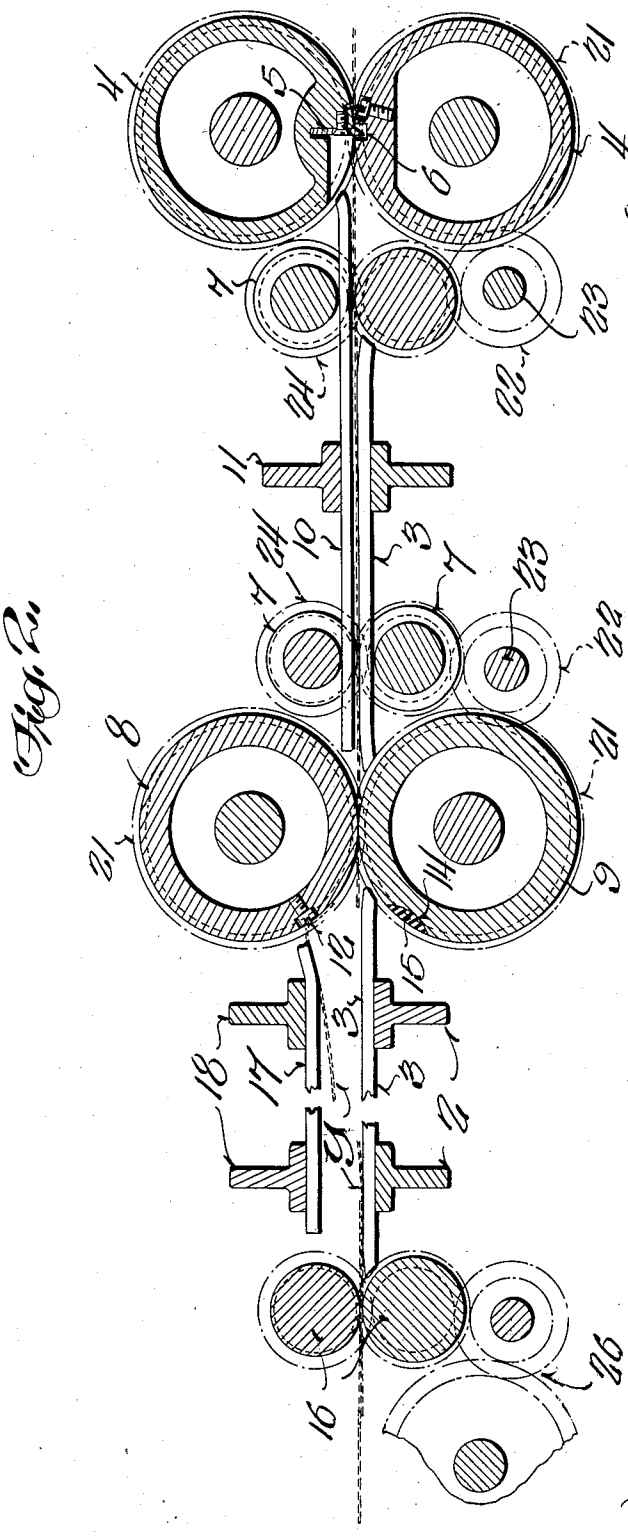


Fig. 2.

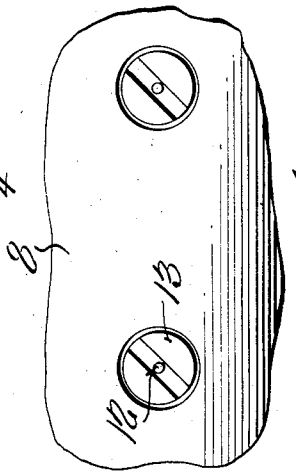


Fig. 4.

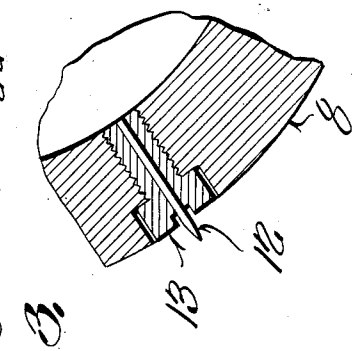


Fig. 3.

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Patented Jan. 27, 1931 1,789,965

UNITED STATES PATENT OFFICE

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MECHANISM FOR SUPERIMPOSING SHEETS OF PAPER

Application filed June 12, 1929. Serial No. 370,211.

This invention pertains to a mechanism for superimposing sheets of paper incidental to subsequent folding or interfolding operations now in common practice.

The primary object of the invention resides in the provision of a simple and efficient mechanism which will rapidly and positively superimpose or overlap successive sheets of paper a predetermined distance essential to subsequent folding operation.

Incidental to the foregoing, a more specific object resides in the provision of a mechanism in which reciprocative parts and tuckers are entirely eliminated, thus materially increasing the rate of production, and simplifying the mechanism.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings is illustrated one complete example of the physical embodiment of the present invention constructed according to the best mode so far devised for the practical application of the principles thereof.

In the drawings, Figure 1 is a fragmentary plan view of a portion of a machine embodying the present invention;

Figure 2 is a longitudinal section taken on the line 2—2 of Figure 1;

Figure 3 is a detail fragmentary section of the lapping roll, and particularly the impinging mechanism; and

Figure 4 is an elevation of the same.

Referring now more particularly to the accompanying drawings, the numeral 1 designates a side frame upon which the various mechanisms are supported, it being understood that in the full machine two such frames are employed.

Mounted upon the side frames are a plurality of transverse braces 2 which carry supporting strips 3 upon which the sheets of paper are fed in the manner hereinafter described.

In the operation of the present mechanism, it is proposed to take the paper from a roll of stock (not shown), and, consequently, a pair of conventional cutter rolls 4 are provided, one of which is provided with a longitudinal knife 5 cooperating with a recess 6 provided in the lower or bed roll, to sever the stock into sheets. From the cutter rolls, the severed sheets are picked up by a series of driven feed rolls 7 which feed the severed sheets to the lapping rolls 8 and 9, respectively.

During the feeding operation of the severed sheets, the same are guided upon the supporting strips by the guide bars 10 carried by the transverse braces 11 which in turn are also mounted upon the side frames 1. From the feed rolls 7, the severed sheets enter the lapping rolls 8 and 9, the roll 8 being provided with a plurality of longitudinally spaced impinging needles 12 carried by the studs 13 threaded into the periphery of the roll 8 to permit replacement of the needles when necessary. The lower or bed roll 9 is provided with a longitudinal recess 14 in which is positioned a resilient strip of material 15 that cooperates with the impinging needles 12 to permit the latter to enter the paper in the conventional manner.

From the foregoing, it will be readily seen that as the severed sheets of paper Y, indicated by dotted lines in Figure 2, pass through the lapping rolls. The rolls are so timed that the rear edge of the sheet will be impinged upon the needles 12 after which the rear edge is raised to permit the succeeding sheet to be fed forwardly beneath the same.

Inasmuch as the feed rolls 7 are driven at a greater speed than the lapping rolls, the same will feed the succeeding sheet forwardly, during the lifting operation of the preceding sheet, a sufficient distance to obtain the desired amount of overlap, it being understood that sufficient space is provided between the rolls 8 and 9 to allow the sheets to be fed through the same at any desired speed. Obviously, the distance of overlap can be

regulated by the speed of the feed or booster rolls 7.

As the superimposed sheets Y leave the lapping rolls, the same are guided upon the supporting strips 3 to the rolls 16, which are driven at a predetermined slower speed than the lapping rolls to compensate for the lost movement of the sheets Y during the period in which their rear ends are raised by the roll 8.

A plurality of spaced stripper bars 17, carried upon the transverse braces 18 and terminating at their rear ends closely adjacent the lapping roll 8, serve to strip the rear edge of the sheets Y from the impinging needles 12 after the sheets have been raised a sufficient distance to permit the overlapping operation of the successive sheets. From the rolls 16, the overlapped or superimposed sheets may be fed to any desired folding mechanism.

While the drive for the various rolls may be obtained in any suitable manner, for the purpose of illustration, it may be assumed that the shaft 19 is driven, and through the bevel gears 20 rotary movement is imparted to the roll 9, which through the gear connection 21, drives the lapping roll 8, and the gear 22 meshing with the lower gear 21 actuates the shaft 23, which through the gear train 24 drives the booster or feed rolls 7.

A shaft 25, connected thru the bevel gears 20, serves to impart movement to the cutting rolls 4 and the rear feed rolls 7, in a manner similar to that described in connection with the lapping and booster rolls.

While the source of power for the retarding rolls 16 has not been illustrated, obviously the same may be taken off from the subsequent folding mechanism (not shown), through the gear train 26, it being understood that the gear ratio provided is such that the rolls 16 are driven at a slower rate of speed than the lapping rolls, as previously described.

From the foregoing, it will be quite apparent that a very simple and positive mechanism has been provided, which will effect an orderly overlapping or superimposing of successive severed sheets of paper, and that the distance of overlapping desired may be readily obtained by merely varying the speed of the booster or feed rolls which effect the overlapping operation, as the lapping rolls raise the preceding sheet.

It will also be appreciated that the maximum rate of production is provided for in that oscillating and reciprocating parts, such as heretofore employed, have been entirely eliminated.

I claim:

1. A mechanism for superimposing severed sheets of paper, comprising means for supporting the sheets, rotary means for raising the rear edge of a sheet out of the path of travel of the succeeding sheet, and means for feeding the forward end of the succeeding sheet into overlapped relation with the rear edge of the preceding sheet.

2. A mechanism for superimposing severed sheets of paper comprising means for supporting the sheets, rotary means for impinging the rear end of each sheet and raising the same out of the path of the succeeding sheet, and means for feeding the forward end of the succeeding sheet into superimposed relation with the rear end of said preceding sheet.

3. A mechanism for superimposing severed sheets of paper comprising means for supporting the sheets, rotary means for impinging the rear end of each sheet and raising the same out of the path of the succeeding sheet, means for feeding the forward end of the succeeding sheet into superimposed relation with the rear end of said preceding sheet, and means for retarding travel of the superimposed sheets.

4. A mechanism for superimposing severed sheets of paper comprising means for supporting the sheets, rotary means for impinging the rear end of said sheet and raising the same out of the path of the preceding sheet, means for feeding the forward end of the succeeding sheet into superimposed relation with the rear end of said preceding sheet, and rolls for retarding travel of the superimposed sheets.

5. A mechanism for superimposing severed sheets of paper comprising means for supporting the sheets, a roll for impinging the rear end of each sheet and lifting the same out of the path of travel of the succeeding sheet, means for feeding each succeeding sheet into superimposed position with the raised end of the preceding sheet, and means for stripping said sheet from said raised roll.

6. A mechanism for superimposing severed sheets of paper comprising means for supporting the sheets, a roll for impinging the rear end of each sheet and raising the same out of the path of travel of the succeeding sheet, means for feeding the succeeding sheet into superimposed position with relation to the preceding sheet, means for stripping the sheets from said raising roll, and a pair of feeding rolls engaging the superimposed sheets, said feeding rolls being driven at a slower speed than said raising roll.

7. A mechanism for superimposing severed sheets of paper comprising means for supporting the severed sheets, a pair of lapping rolls, means for feeding the severed sheets to said lapping rolls, means carried by one of said lapping rolls for engaging the rear edge of each sheet and directing the same out of the path of travel of the succeeding sheet, and means for retarding the travel of said sheets while engaged by said lapping rolls.

8. A mechanism for superimposing severed sheets of paper comprising means for sup-

porting the severed sheets, a pair of lapping rolls, means for feeding the severed sheets to said lapping rolls, means carried by one of said lapping rolls for engaging the rear edge of each sheet and directing the same out of the path of travel of the succeeding sheet, means for retarding the travel of said sheets while engaged by said lapping roll, and means for stripping said sheets from said lapping rolls.

In testimony that I claim the foregoing I have hereunto set my hand at Green Bay, in the county of Brown and State of Wisconsin.

PETER J. CHRISTMAN, JR.