

997,211.

K. RÖGER.  
PAPER FEEDING APPARATUS.  
APPLICATION FILED SEPT. 2, 1909.

Patented July 4, 1911.

3 SHEETS—SHEET 1.

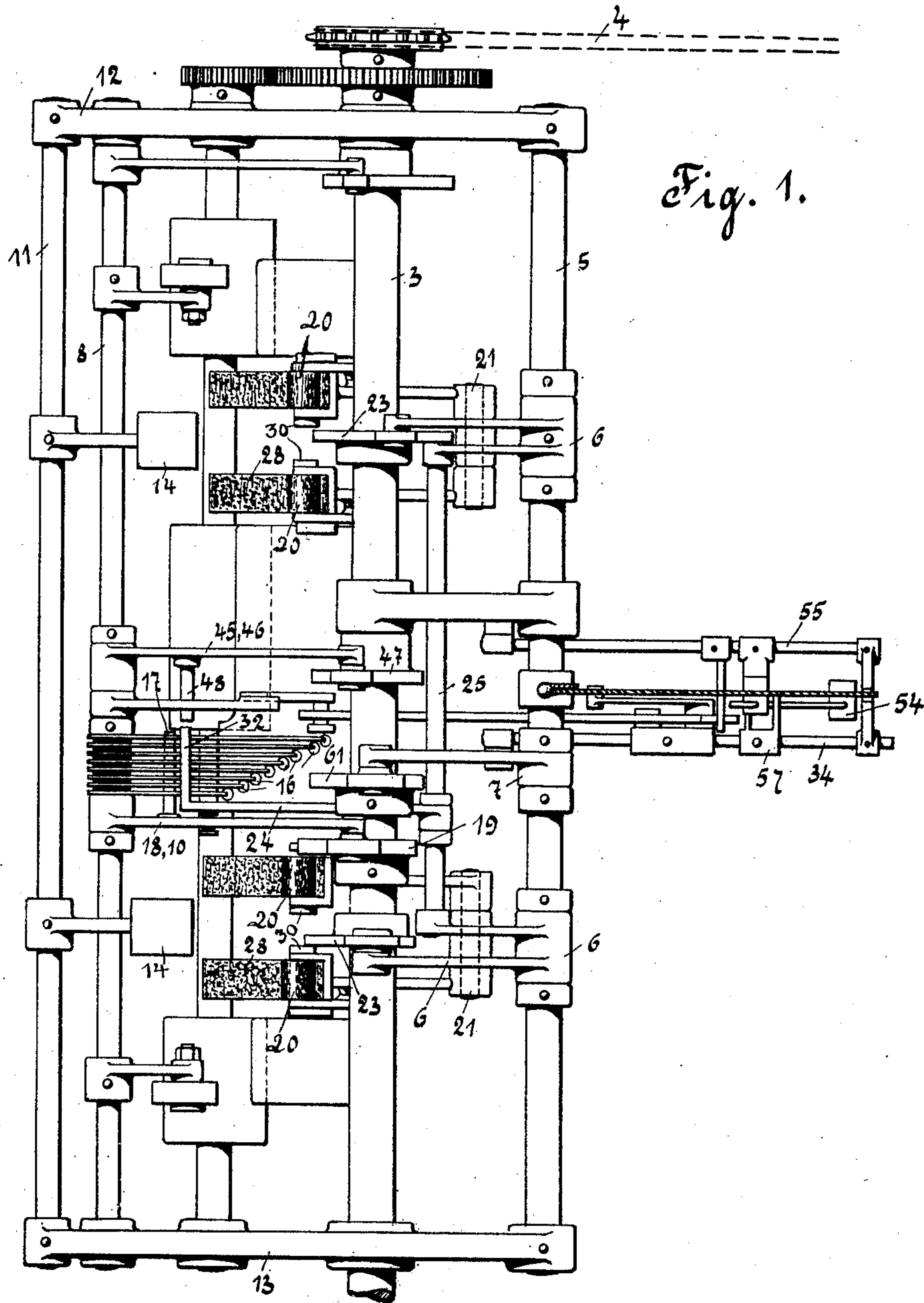


Fig. 1.

Witnesses:  
*Bruno F. ...*  
*H. ...*

Inventor.  
*Karl Röger.*

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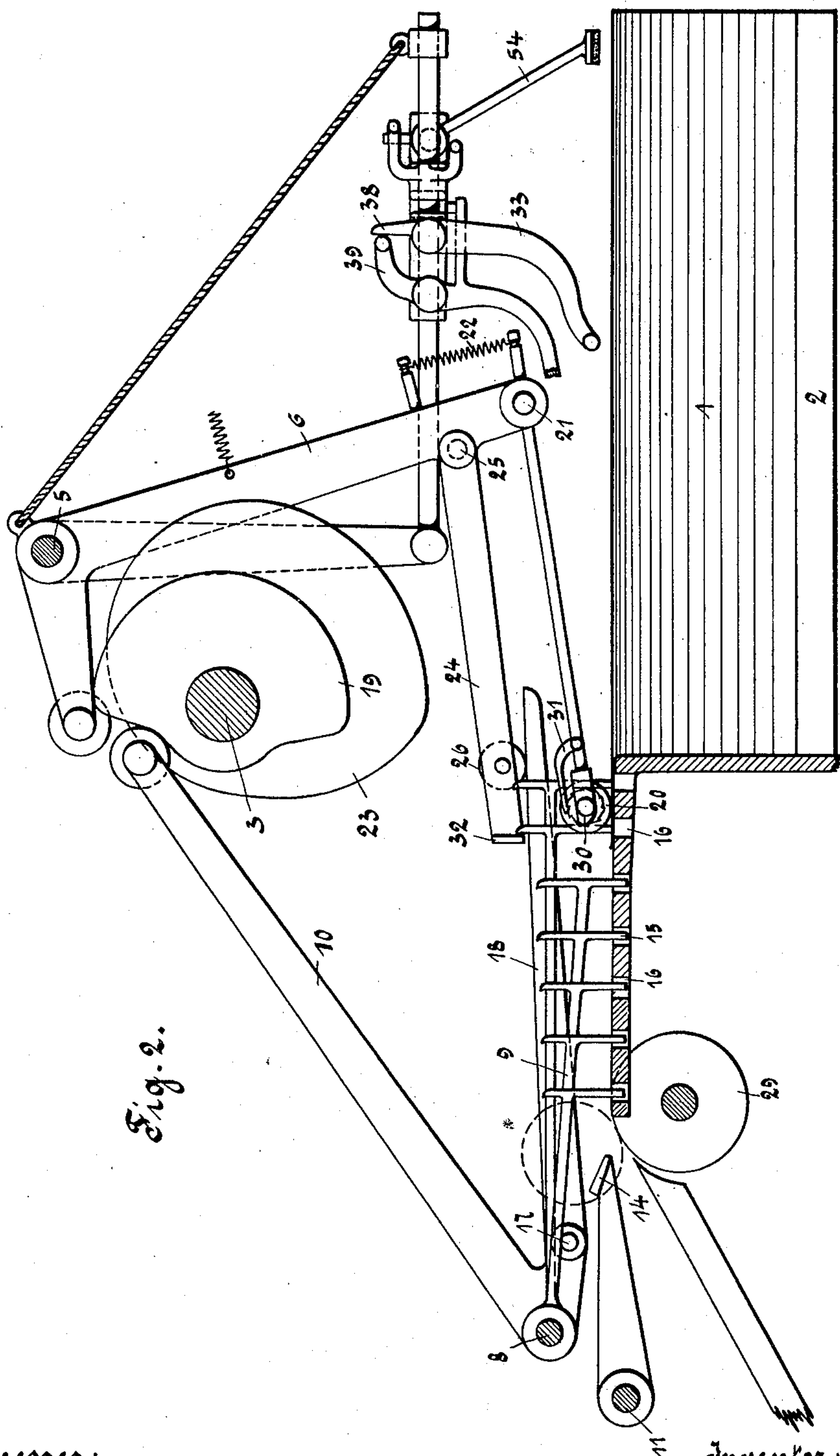


Fig. 2.

Witnesses:  
Gustav Röger,  
Karl Röger

Inventor:  
Karl Röger

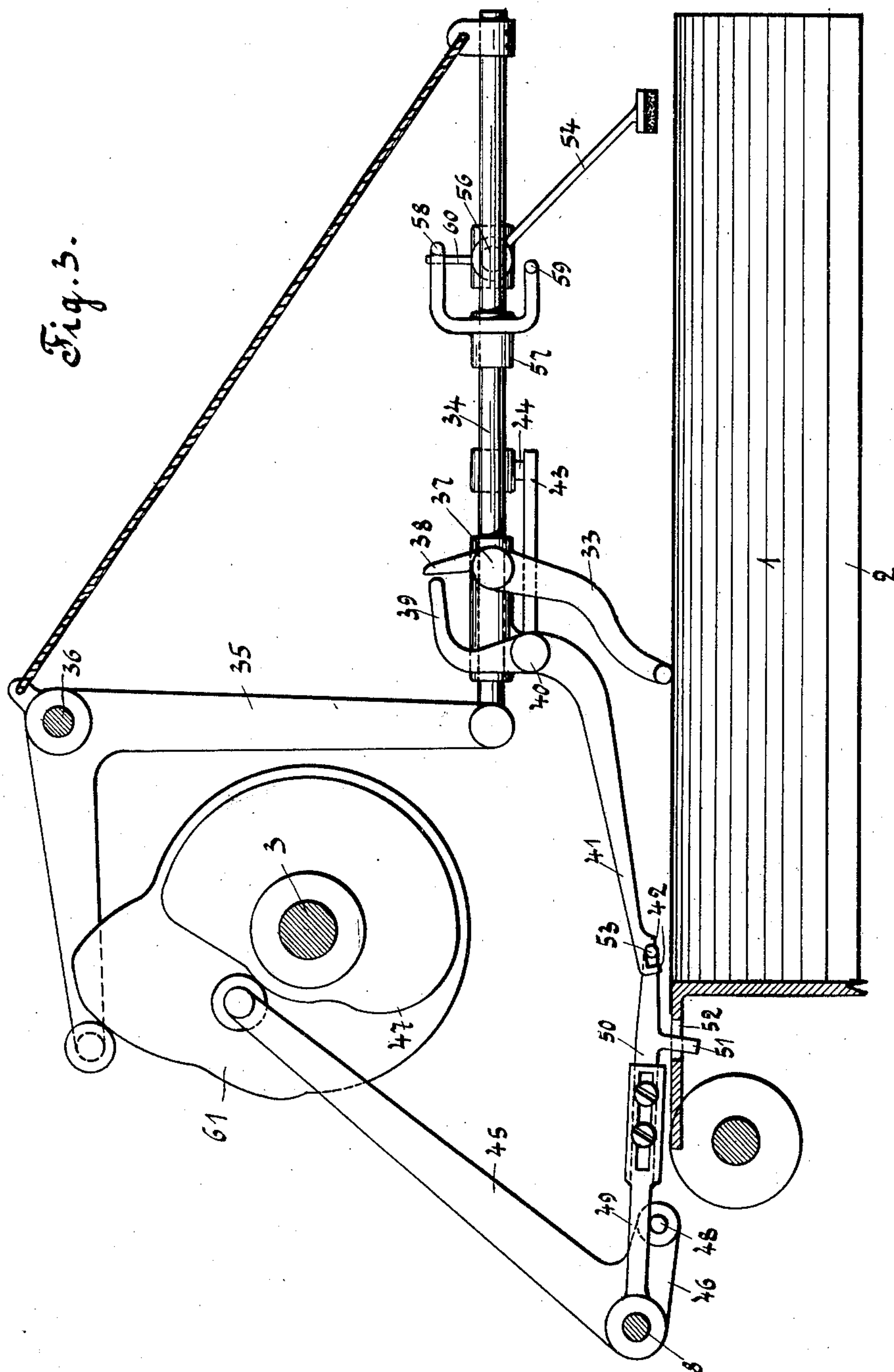
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3 SHEETS—SHEET 3.

Fig. 3.



Witnesses:  
*Gustav Müller*  
*Karl Röger*

Inventor:  
*Karl Röger*



# UNITED STATES PATENT OFFICE.

KARL RÖGER, OF BERLIN, GERMANY.

## PAPER-FEEDING APPARATUS.

997,211.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed September 2, 1909. Serial No. 515,943.

*To all whom it may concern:*

Be it known that I, KARL RÖGER, of Katzbachstrasse 5, Berlin, German Empire, having invented certain new and useful Improvements in or Relating to Paper-Feeding Apparatus, do hereby declare that the following is an exact specification of the same.

In paper feeding apparatus in which a feed finger is used which places the excess of sheets of paper carried away, in steps on a stop-support arranged in front of the pile of paper, a construction is already well known by which the uppermost sheet is always seized by the feed finger at the same distance from the front edge, so that when the sheet of paper has already been printed upon, the feed finger need not slide over the printed portions. In that construction there are provided feelers which are mounted on the feed finger and rest against the uppermost sheet. On passing beyond the front edge of the said sheet, they sink however into a slot in the feeding board, so that the feed finger can come to rest on the sheet. This apparatus, however, presents the disadvantage that the feelers slide over the printed sheet.

The above disadvantage is obviated according to this invention by the arrangement of the feelers on the frame of the apparatus itself, owing to which the feed finger moves back only to an extent corresponding to the position of the sheet which is uppermost at the time. Constructions according to this invention have a further advantage over the former construction, in that in the apparatus according to this invention, in addition to the feed finger, there are also provided separate fingers for detaching the sheet, the so-called preliminary advance fingers which are of special importance in cases of wavy or moist paper, and that by means of a special brake device, the sheets not carried by the feed finger, are held back on the feeding board.

Figure 1 of the accompanying drawings is a plan of the whole apparatus; Fig. 2 a vertical section through the same seen from the side with the preliminary advance fingers removed; and Fig. 3 is a side elevation of the preliminary advance apparatus.

The stack of paper 1 rests on a table or feeding board which is automatically raised by means of a suitable gear not shown in the drawing. The frame of the apparatus is constituted by the two lateral standards 12

and 13 which are kept at the proper distance apart by two connecting rods 5 and 11 secured to them.

The whole apparatus is driven from the main spindle 3 which in its turn is driven by the driving gear of the press by means of the chain 4. All the driving eccentrics or cams are mounted on the said spindle 3.

The feeler mechanism which is used for feeling or finding the position of the foremost sheet, consists of a number of feelers 9 which are all of different length and are each provided at their free end with a hammer-like head 15. The feelers are movable about the spindle 8 (Fig. 2). A double lever with two arms 10 and 18 which is also rotatable on the spindle 8, carries on its arm 18 a pin 17 which engages under all the feelers and raises them on being raised. The lever 10 is driven by means of a cam 19 mounted on the spindle 3. The feeding board itself is provided at the points at which are arranged the heads of the feelers with perforations 16 into which can sink the heads of the feelers, when the openings are not covered by paper. According, therefore, as to whether the uppermost sheet is advanced to a greater or less extent, a larger or smaller number of feelers will sink into the feeding board. At the beginning of each stroke, owing to the suitable shape of the cam disk 19, the double lever 10 18 is lowered, and the feelers are, therefore, given an opportunity of sinking into the openings of the feeding board. That number of feelers which remains raised as the opening corresponding to it is already covered by paper, controls the movement of the feed finger in the following manner. The feed finger 20 (Fig. 2) is rotatably mounted about the pin 21 and pressed by means of a spring 22 against the paper sheet. The said feed finger is moved by means of the lever 6 rotatably mounted about the spindle 5 and driven in well known manner by means of a cam disk 23 mounted on the spindle 3 (Fig. 2). On the same lever 6 is mounted a brake lever 24, so as to be rotatable about the point 25. With its rollers it rests on the arm 18 of the double lever 10, 18. The front end of the brake lever 24 is formed into a hook 32. The dimensions are calculated in such manner that in the position of the double lever 10 18 in which the feelers, and with them also the brake lever, are raised, the hook-shaped end of the



same passes over the upper projections of the heads of the feelers. When, however, the double lever 10 18 is lowered, the brake lever 24 can pass only over those keys which are sunk into the holes of the feeding board. It engages however with the first of the feelers remaining raised, so that in that way the return movement of the lever 6 which is effected only by the action of springs, is stopped. Owing to that, the feed finger 20 mounted on the lever 6, will also be prevented from continuing its backward movement. The extent of the backward movement of the feed finger depends, therefore, on the number of the feelers which have sunk in the feeding board. According as the uppermost paper sheet is advanced to a greater or less extent, the feed finger will move more or less backward, and during the next following advance movement, it will always seize the uppermost sheet at an approximately equal distance from the edge. The greater the number of feelers and the closer they are arranged together, the more uniform will be the feeding of the sheets. The advance of the sheet seized by the feed part is effected in the well known manner. For separating the individual sheets by means of the feed finger, the feeding board is provided with a rough stop-support 28 made of rubber, so that in case the feed part carries with it several sheets, the sheets at the bottom will be always kept back by the rough stop, and only the uppermost sheet would be advanced to the end position. In the end position, the feed finger must be lifted off from the sheet in order to enable the latter to slide down into the machine over the transport roller 29. This lifting off is effected by the projection 30 arranged on the side face of the feed finger coming into contact with a wedge 14, so that during the further movement of the lever 6, the projection 30 slides upward on the wedge shaped surface 14 and thus raises the feed finger. The feed finger itself is constituted by a roller with rough rubber covering. In order that the point of engagement of the said roller should change at every operation, there is provided in a well known manner a ratchet pawl 31 which during the advance movement holds fast the roller, but allows it to turn during the return movement of the feed finger.

In order to facilitate separation of the individual sheets from each other when the paper is wavy or moist, there is provided according to this invention a separating or detaching device. This device is intended to become operative only when the sheets adhere to each other and are not advanced by the feed finger. It chiefly consists of the so-called preliminary advance finger 33 (Fig. 3) secured to a rod 34 and reciprocated by the latter. The rod 34 is driven

by a bell crank lever 35 which is rotatably mounted about the spindle 36 and receives its movement from a cam disk 61. The preliminary advance finger 33 is rotatably mounted about a point 37 and provided with an upper extension 38. With the said extension 38 engages an angle-shaped extension 39 of a second lever 41 rotatable about 40 and provided at the bottom end with two projections 42. The lever 39, 41 has, moreover, a further projection 43 engaging with the stop 44 and preventing the lever arm 41 from sweeping too far on the stack or pile of paper. About the spindle 8 is rotatably mounted another double lever 45 46 driven by the cam disk 47, the arm 46 of the said lever carrying a pin 48 engaging under another lever 49 mounted in a loosely rotatable manner about 8, so that the said lever 49, on the cam disk 47 rotating, is carried upward by the pin 48 and during the descent is given the opportunity to descend. The lever 49 is provided with an extension 50 which can be telescopically pushed in or out by means of slots and pins. The lever extension 50 carries a head 51 to which corresponds an opening 52 having an elongated shape, in the feeding board, so that, on the lever 50 descending, the head 51 can engage with the opening 52. The front end of the lever 50 carries a branch 53 engaging between the two projections 42 of the lever 41. At the beginning of the stroke, the pin 48 is first lowered, and with it the telescopic lever 49 50. According as the opening 52 is covered with paper or not, the head can or cannot engage with it. If the opening is closed with paper, the lever 50 and with it the lever 41 remain raised, namely in such manner that the arm 39 engages with the projection 38 of the preliminary advance finger in such manner that the latter is held lifted off from the stack of paper. If, on the contrary, the opening 52 is not covered with paper, so that the head 51 can penetrate into the same, the arm 39 moves away from the projection 38 of the preliminary advance finger, and the latter engages with the stack of paper. The rod 34 is then driven forward by means of the cam disk 61. The preliminary advance finger and the lever 41 are advanced, and the former detaches the sheets adhering together. The front edges of the sheets are prevented from running against the head 51 by the telescope-like adjustment already mentioned and by the longitudinal shape of the opening 52. During the advance movement of the lever 41, the back projection 42 drives the lever 50, so that, to the same extent as the sheets advance, the head 51 moves back. The preliminary advance finger is then lifted off again by means of the cam disk 47. The rod 34 again makes its return movement and the front projection 42 of the lever 41



again brings the telescopic lever 49 50 to its original length. In order to keep back the sheets not yet detached, there is provided a holding finger 54 secured to the rod 55 arranged parallel to the rod 34 (Fig. 1) and rotating about the point 56. To the movable rod 34 is connected a bifurcated part 57 which can raise the holding finger 54 by means of the two projections 58 59. During the advance movement of the rod 34, the projection 58 of the fork 57 strikes the projection 60 of the holding finger and raises the latter. During the return movement of the rod, the holding finger is first lowered and can remain in that position until the stop 59 strikes direct the holding finger 54 and again raises it. Owing to this arrangement, the holding finger rests on the stack of paper only during the period from the completion of the preliminary advance movement until the new engagement of the feed finger during the next stroke. The position of the finger 54 is an oblique one, so that by pulling the paper forward, the said finger is firmly pressed against the paper stack and, therefore, the paper is held in a particularly reliable manner.

The whole device works in the following manner. At the beginning of the stroke, the lever 45 46 is first lowered, so that the lever 50 "feels" whether a preliminary advance of the paper is required. If the paper has already been advanced to such an extent that the opening 52 of the table is covered, no preliminary advance takes place. If, however, the head 51 of the lever 50 can sink into the opening of the feeding board, the paper is advanced in the preliminary manner in the way described. During that movement, the holding finger 54 was held raised by the projection 58, and now the lever 50 is again raised, the preliminary advance finger is moved back by the rod 34, and the holding finger is lowered on to the pile of paper. In the meantime, the feelers 9 have been lowered in order to feel the front end of the uppermost sheet. The feed finger has moved back to a greater or less extent according to the extent to which the feelers could sink into the feeding board. It then seizes the sheet near the front edge and carries it forward in the manner described in order to carry it to the point of treatment, whereupon the operation begins again.

The accompanying drawing shows, of course, only one construction by way of example, the separate arrangements and devices could also be replaced by equivalents.

Having now particularly described and ascertained the nature of my invention and in what manner the same is to be performed, what I desire to secure by Letters Patent is:

1. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, a feed

finger shifting the sheets and coming in contact with the sheet which at the time is the uppermost one, said feed finger grasping the uppermost sheet always nearly at the same distance from the front edge by moving back only to the extent corresponding to the position of the sheet to be grasped, means for moving the feed finger and means for controlling the return movement of the feed finger.

2. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, a feed finger shifting the sheets and coming in contact with the sheet which at the time is the uppermost one, said feed finger grasping the uppermost sheet always nearly at the same distance from the front edge by moving back only to the extent corresponding to the position of the sheet to be grasped, means for moving the feed finger and a feeler device for controlling the return movement of the feed finger.

3. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, a feed finger shifting the sheets and moving back only to the extent corresponding to the position of the sheet which at the time is the uppermost one, means for moving the feed finger and a feeler device controlling the return movement of the feed finger and consisting of feelers of different length arranged on a fixed frame.

4. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, a feed finger shifting the sheets and moving back only to the extent corresponding to the position of the sheet which at the time is the uppermost one, a feed board, openings in the said feed board arranged one behind another in the direction of movement of the sheet, means for moving the feed finger and a feeler device controlling the return movement of the feed finger and consisting of feelers of different lengths arranged on a fixed frame, and according to the position of the uppermost sheet, sinking into the said openings of the feed board or coming to rest on the sheet itself.

5. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, a feed finger shifting the sheets and moving back only to the extent corresponding to the position of the sheet which at the time is the uppermost one, a feed board, openings in the said feed board arranged one behind another in the direction of movement of the sheet, means for moving the feed finger and a feeler device consisting of feelers of different lengths arranged on a fixed frame, and according to the position of the uppermost sheet, sinking into the said openings of the



feed board or coming to rest on the sheet itself, the foremost of said feelers engaging with the sheet controlling the return movement of the feed finger.

5 6. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, a feed finger shifting the sheets, a feed board, openings in the said feed board, means for moving the feed finger, a feeler device controlling the return movement of the feed finger, a brake or stop lever mounted on the feed finger and means for guiding said stop lever in such a manner that during the advance movement of the feed finger, it passes over the heads of the feelers, while during the return movement, it engages with the first feeler which remains raised, and prevents further movement back of the feed finger.

20 7. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, comprising a feed finger shifting the sheets and a separate preliminary advance finger detaching the sheets before the shifting movement of the feed finger takes place, means for moving the feed finger and means for holding the preliminary advance finger inoperative if the feed finger has already shifted the uppermost sheet, but operating it when the uppermost sheet has not yet been advanced a predetermined distance.

35 8. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, comprising a feed finger shifting the sheets and a separate preliminary advance finger detaching the sheets before the shifting movement of the feed finger takes place, means for moving the feed finger, a feeler device holding the preliminary advance finger inoperative if the feed finger has already shifted the uppermost sheet, but operating it when the uppermost sheet has not yet been advanced a predetermined distance and means for transferring the movement of the feeler device to the preliminary advance finger.

50 9. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, comprising a feed finger shifting the sheets and

a separate preliminary advance finger detaching the sheets before the shifting movement of the feed finger takes place, means for moving the feed finger, a feed board having an opening, a feeler device mounted on the machine frame, holding the preliminary advance finger inoperative if the uppermost sheet shifted by the feed finger covers the opening in the feed board but operating the preliminary advance finger when the said opening is not covered by paper the feeler being enabled to engage with the opening and means for transferring the movement of the feeler device to the preliminary advance finger.

10. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, comprising a feed finger shifting the sheets and a separate preliminary advance finger detaching the sheets before the shifting movement of the feed finger takes place, means for moving the feed finger, a feed board having an opening, a feeler device mounted on the machine frame and sinking into the said opening in the feed board and means for transferring the movement of the feeler device to the preliminary advance finger said feeler being made telescopic.

11. In a paper feed apparatus in combination a separator separating the sheets and advancing them to different positions, comprising a feed finger shifting the sheets and a separate preliminary advance finger detaching the sheets before the shifting movement of the feed finger takes place, means for moving the feed finger, a feed board having an opening, a feeler device mounted on the machine frame and sinking into the said opening in the feed board, said feeler being made telescopic, means for transferring the movement of the feeler device to the preliminary advance finger and means for pushing forward the feeler head sunk into the feed board in order to avoid damage of the advancing sheet.

In witness whereof I have hereunder set my hand in presence of two witnesses.

KARL RÖGER.

Witnesses:

WOLDEMAR HAUPT,  
HENRY HASPER.