

May 28, 1929.

G. SPIESS

1,714,527

SHEET FEEDING MECHANISM

Filed Oct. 13, 1926

3 Sheets-Sheet 1

Fig.1.

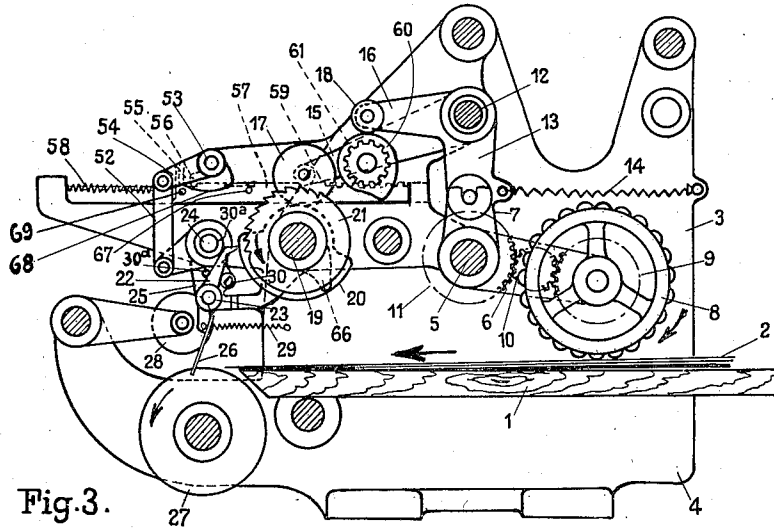


Fig.3.

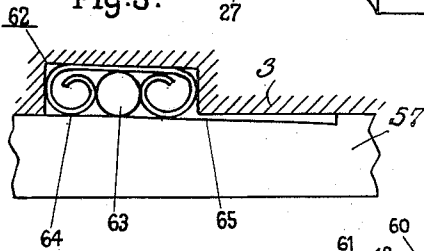
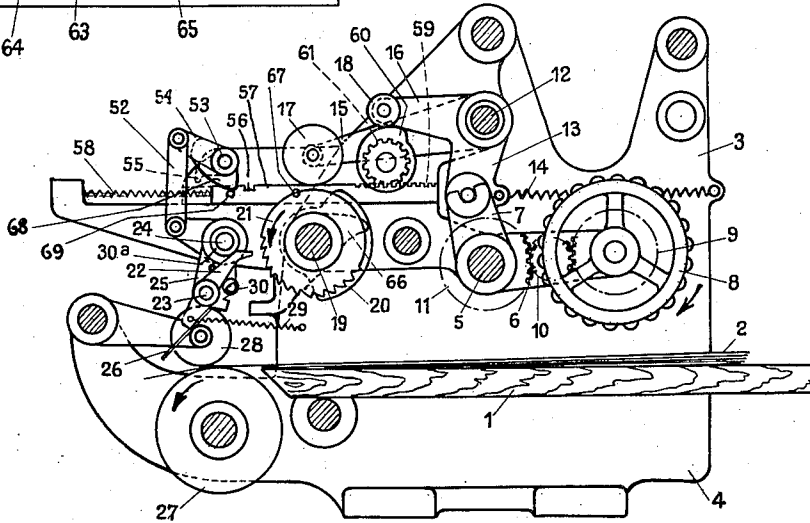


Fig.2.



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Fig. 4.

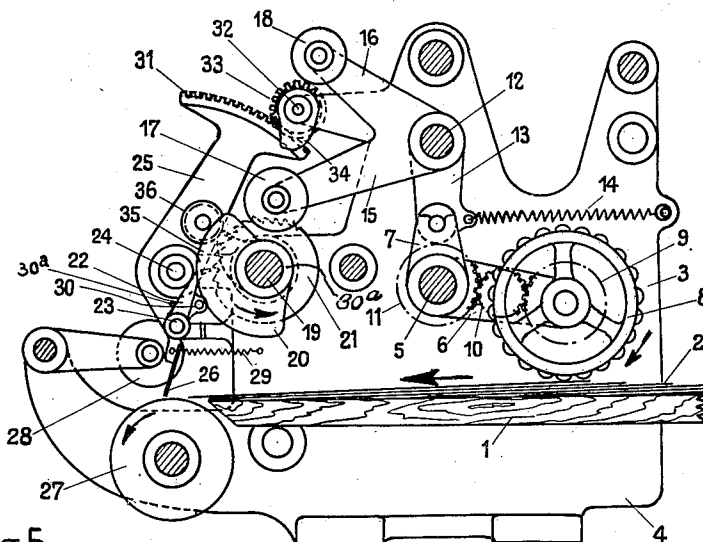


Fig. 5.

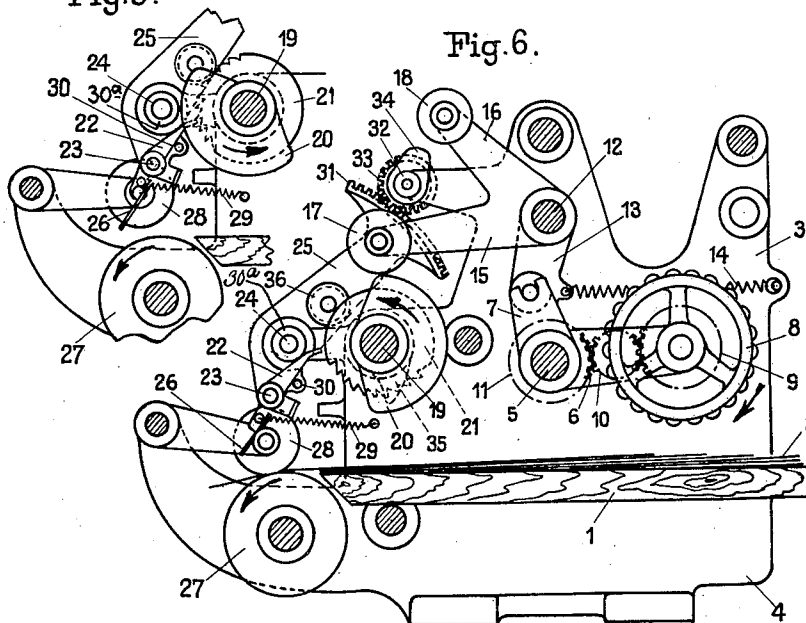


Fig. 6.

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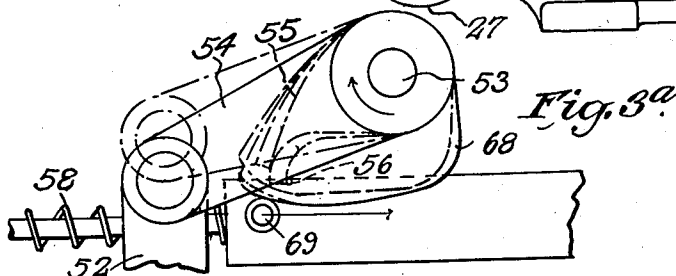
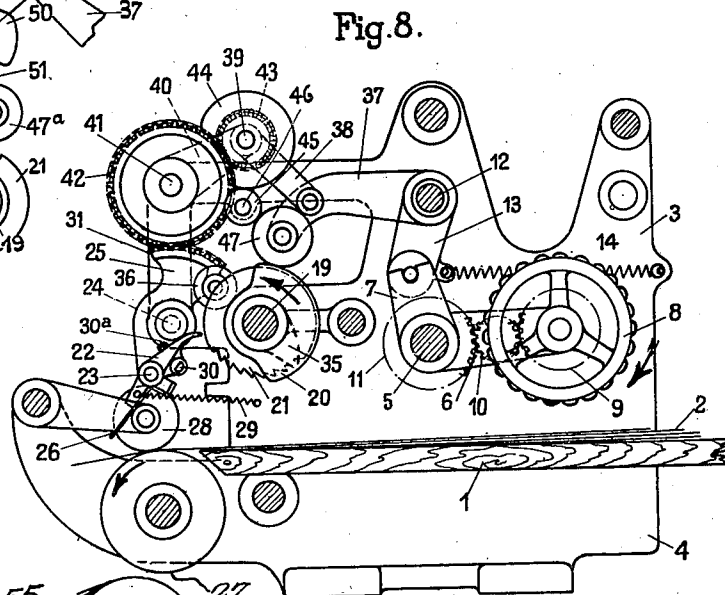
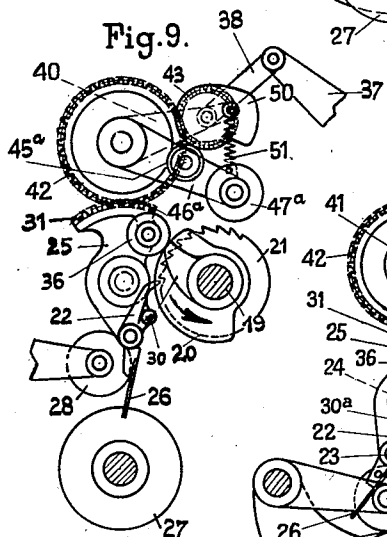
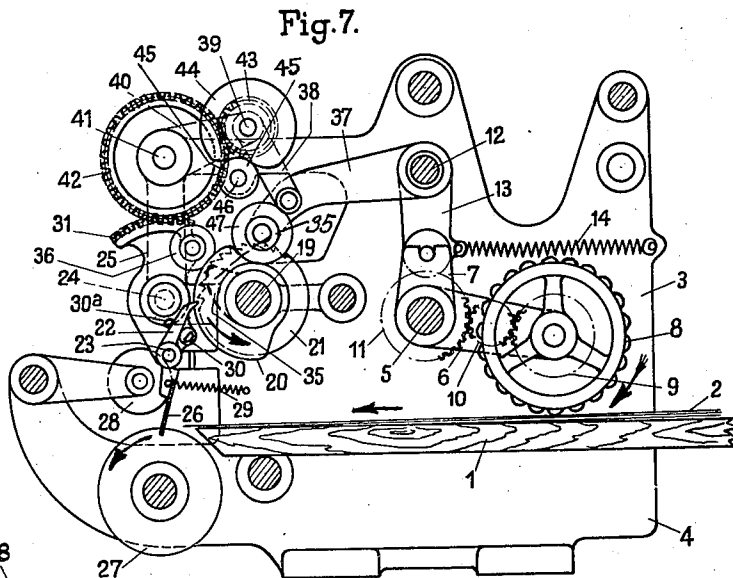
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SHEET FEEDING MECHANISM

Filed Oct. 13, 1926

3 Sheets-Sheet 3



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1,714,527

UNITED STATES PATENT OFFICE.

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SHEET-FEEDING MECHANISM.

Application filed October 13, 1926, Serial No. 141,273, and in Germany November 16, 1925.

This invention relates to mechanism for mechanically feeding sheets to printing or folding machines and the like. In the operation of such a mechanism it is essential that the separation of the individual sheets from the bank or stack of sheets be effected in synchronism with the regularly repeated operations of the printing or other machine being fed, or, at any rate, within particular periods of the cycle of operations. Devices such as friction wheels or the like, whereby the separation of the sheets from the bank of sheets is effected, must, therefore, be thrown into and out of action at the proper times, and it is particularly important that when the sheet has been separated and advanced into the position in which the transfer mechanism takes hold of it, it must be instantly released by the separating device to prevent the sheet from being buckled, creased or otherwise damaged.

Mechanisms are known, in which the members for separating the sheet from the bank of sheets, such as friction wheels, suction wheels or the like, are controlled by lever gear actuated by a control member, as, for instance, a cam, rotating at a speed synchronizing with the speed of the printing or folding machine, so that in each sequence of operations such separating members are operative for a feed action only during the proper feed period. Mechanisms are also known which embody a control device actuated by the separated sheet itself, which interrupts the operation of the sheet separating members as soon as a sheet has been separated and advanced into the transfer position. Control devices of this latter-named kind act, for example, in such a manner that the sheet fed from the bank of sheets imparts to a feeler a swinging movement, which, if the advance of the sheet has been effected at so early a moment that the friction wheels continue to be operative for too long a period of time, causes a previously inoperative force to be applied, or a member to be coupled with the throw-out device, so as to interrupt the operations of the friction wheels. Usually under such conditions the feeler is automatically swung out to such an extent as to allow the sheet to pass on. If, however, the advance of the sheet is so much delayed that the sheet cannot be seized by the transfer mechanism in synchronism with the sequence of operations of the working parts of the machine to which the sheets are being fed, the movement of the feeler re-

mains ineffective and the friction wheels are thrown out of operation during their normally operative period by means of a regularly operating control member provided for the purpose.

Known mechanisms of these types, in which the actuation of the sheet separating members is controlled, either by the release of a spring actuated control device, or positively by means of a member which is coupled with the throw-out gear through the swinging motion of the feeler, have the defect of operating in a jerky manner.

My invention has for its object to improve the efficiency of such mechanisms, and I do this primarily by transmitting the movement imparted by the control member to the throw-out device, also to a cam which in turn effects the interruption of the operation of the separating member preferably by raising the friction-wheels only slightly from the surface of the bank of sheets, just sufficiently to interrupt their action, while allowing a further raising movement of the friction-wheels to be performed by the control member specifically provided for the purpose.

With devices operating with a spring, the effect is improved by the provision of a brake which becomes operative upon the member actuated by the spring towards the end of its movement, ensuring an easy working motion and freedom from jerkiness.

With devices in which the throw-out mechanism is positively actuated by a control member, the efficiency is improved by preventing acceleration of the actuated lever gear in relation to the control member and by withdrawing the coupling pawl from engagement with the ratchet wheel by the movement of the lever gear without any acceleration thereof.

In some known devices the sheet separating members are controlled by two members independently, one from the other, namely, by means of a lifting member actuated by the drive gear at regular intervals and by a lifting device controlled by the separated sheet. A difficulty with such devices is that the contact element of the throw-out gear coacting with the cam disks of the controllers can only contact with the maximum throw points of the curved cam surfaces of the disk in a single position of the control lever gear, i. e., in that position which the gear assumes in the lowest operative position of the separating members. It is obvious, however, that in opera-

tion the friction wheel does not always occupy this position, inasmuch as neither the thickness of the sheets nor the number of sheets below the friction wheels is always the same. The friction wheel will, therefore, in its operation assume positions at varying altitudes so that the contact elements of the lever gear are correspondingly varied in arrangement, i. e., spaced greater or less distances from the axes of their actuating cams. Moreover, when the releasing mechanism is actuated by the sheet operated lifting device, and interrupts the operation of the friction wheel, the contact element cooperating with the regularly acting throw-out member is still further removed from it, so that a positive lifting connection between the lever gear of the friction wheel and its actuating members is not always established.

According to the present invention, this defect is removed by the provision of a mechanism in which the friction wheel lever gear is, irrespective of the position of the friction wheel, permanently connected in a positive manner to both control members and the necessary compensation effected by a cam curve, which automatically adjusts itself to variations of level of the friction wheel.

Several examples of mechanism according to the invention are illustrated in the accompanying drawings, in which for the sake of clearness such details as are not necessary to a clear understanding of the invention are omitted and only the device for the control of the friction wheels is shown.

Figs. 1 to 3 show a mechanism in which a friction wheel controlling lever gear is actuated by means of a spring released by the control mechanism; Figs. 1 and 2 begin side elevations showing two different positions of the members while Fig. 3 is a detail section on an enlarged scale.

Fig. 3^a is a detail view of the means for unlocking the bolt and raising the feeler to clear the path for the sheet.

Figs. 4 to 6 show mechanism in which the friction wheel controlling lever gear is positively actuated by a control member with which it is coupled by means of the control mechanism; Fig. 4 shows in side elevation the normal position of the several members of the mechanism with the friction wheel in working position; Fig. 5 in elevation part of the mechanism with the several members thereof in the positions they assume after the control feeler has been swung out; and Fig. 6 an elevation of the mechanism with the members in the positions they assume after the coupling has been disconnected and the friction wheel completely raised.

Figs. 7 and 8 show in elevation a mechanism of the type shown in Figs. 4 to 6 for the control of a friction wheel with compensating mechanism arranged between the friction wheel controlling gear and the two cam disks

operating upon the levers gear; Fig. 7 showing the working position and Fig. 8 the thrown-out position thereof.

Fig. 9 shows a simplified modification of a construction similar to that shown in Figs. 7 and 8.

In the drawings 1 indicates the feed table of a sheet feeding mechanism on which is deposited a feathered out bank of sheets 2 of which only the most advanced sheets are visible. In the guide cheeks 3 of the frame 4 is journaled a drive shaft 5 on which is rotatably (loosely) mounted a bell crank lever having a long arm 6 and a short arm 7. The arm 6 carries at its free end a friction wheel 8 which is driven by a train of gears 9, 10, 11 from shaft 5. The short lever arm 7 is linked to a lever arm 13 which is mounted on a shaft 12 and under the influence of a tension spring 14 having the tendency to depress the friction wheel 8 towards the bank of sheets 2. The shaft 12 further has fixed thereto two arms 15, 16 each of which is provided with a roller 17, 18 respectively. The roller 17 runs on the circumference of a cam disk 20 mounted on a shaft 19, which cam is of such configuration that, in its controlling movements of parts 5, 6, 13 and 15, it allows the friction wheel 8 to ride on the bank of sheets 2, for a predetermined period of its revolution only, while during the remaining period of the revolution of the friction wheel it supports the friction wheel at a distance (elevated above) from the bank of sheets.

The shaft 19, which is suitably driven from and in timed accord with shaft 5, further carries a ratchet wheel 21 which is provided with teeth over a part of its circumference only. Opposite to the ratchet wheel 21 is arranged a coupling pawl 22, pivotally mounted, as at 23, upon one arm (the lower arm) of a two armed lever 25 carried by a shaft 24. The pawl 22 is extended below its fulcrum 23, and its extended portion carries a feeler 26 which reaches into the path of the sheets 2 and arrests the sheets advanced by the friction wheel 8 in the position in which it is to be seized by the forwarding or transfer rollers 27 and 28. The feeler 26 and pawl 22 are held in their normal working positions by a light tension spring 29 which yields under the pressure of the sheet upon the feeler 26. Stops 30 and 30^a provided on lever 25 limit the oscillatory movements of the pawl 22.

In the example illustrated in Figs. 1 to 3 the other or upper arm of lever 25 is connected by a link 52 to a swinging arm 54 fixed on a shaft 53. This shaft 53 further carries a toothed locking dog 55, the locking tooth of which normally engages in a notch 56 of a longitudinally slidable rack bar or lock bolt 57. A cam 68 is rigidly connected to the shaft 53 carrying the lock dog 55, to cooperate with a contact pin or roller 69 arranged laterally in the bolt 57. The bolt 57 is under

the influence of a compression spring 58 and provided on its upper side with rack teeth 59 which mesh with a gear wheel 61 rigidly fixed to a cam disk 60. Upon the circumference of this cam disk 60 runs the roller 18 of the lever arm 16.

In that portion of the face of the frame 4 in which the bolt 57 is guided a recess 62 is formed in which a ball, roller or other suitable clamping piece 63 (see Fig. 3) is housed. Between this ball and the ends of the recess springs 64 are arranged, which hold the ball between them. The bolt 57 is provided on its side which faces the recess 62 with a wedge-like inclined surface 65 which is approximately of the length of the bolt stroke and cooperates with the ball 63 towards the end of the working movement of the bolt in the manner of a brake.

The shaft 19 further carries a finger 66 which acts upon a pin 67 provided laterally on the bolt 57 and returns the bolt, together with the associated members of the mechanism, to normal position after actuation.

When the feeler 26, by impact of a sheet advanced by the friction wheel 8, is swung about its pivot, the pawl 22 engages the toothed part of the ratchet wheel 21, which carries the pawl 22 along with it and thereby causes the lever 25 to rock. This movement of lever 25 effects, by means of the link 52 and arm 54, a partial rotation of shaft 53 in a clockwise direction to effect the release of the bolt 57, through retraction of lock dog 55. The spring 58 thereupon pushes the bolt back, thereby through gear 61 rotating the cam disk 60, so that the friction wheel 8 is raised by means of the lever gears 16, 13, 7, 5, 6. Simultaneously the pin or contact roller 69 is shifted rearwardly from the normal position shown in Figs. 1 and 3^a along the face of the cam 68. This cam projects mainly to the left hand side of the vertical plane of shaft 53 and terminates at its extreme left hand portion in a point, just in rear of which the pin or roller normally lies. Between the point and heel of the cam the cam face has a convex surface of major projection lying in a horizontal plane below the heel and point portions and arranged upon that portion of the cam projecting beyond the left hand side of the vertical plane of shaft 53. When the bolt 57 and pin 69 are shifted to the right the pin 69 engages the said convex surface of the face of the cam and exerts a lifting force on the cam, whereby, as the shaft 53 is held against vertical movement, and the lifting force is extended on the left hand side of the vertical center of the shaft, the cam is caused to perform the function of a lever which turns the shaft in a clockwise direction and raises the arm 54 to a further degree than that effected by movement of lever 25, and to an extreme limit, as shown by dotted lines in Fig. 3^a,

thereby moving lever 25 with pawl 22 and feeler 26 still further forward, with the result that the pawl 22 is disengaged from the ratchet wheel 21 and the finger 26 raised to clear the path for the travel of the sheet. The movement of the bolt is subjected towards its end to brake action by the inclined surface 65 running against the ball 63, whereby the bolt is wedged or frictionally pressed tightly against its guide. The rotation of shaft 19 also causes the cam disk 20 to be brought below the roller 17 of arm 15 and effects thereby the raising of the friction roller 8 from the bank of sheets 2. By suitable means, not shown, roller 28 is now lowered onto the forwarding roller 27, whereby the advanced sheet is gripped and moved in the direction of the printing or folding machine, and at this time finger 66 on shaft 19, acts upon the pin 67 and forces the bolt back to its normal position (Fig. 1) in which the bolt is retained by engagement of lock dog 55 with the notch 56. The remaining members of the feed mechanism are restored to normal position, ready for a repetition of the operation above described, partly by the action of the feeler spring 29 and by gravity through the weight of the members 6, 16, 54, 55, or by a special spring not shown in the drawings, and also partly by the finger 66 acting against the pressure of spring 58. It is to be understood that rollers 27 and 28 may form part of the usual transfer mechanism arranged at the left in Fig. 1 between the feeder above described and the printing, folding or other machine supplied with sheets from the stack 2. This transfer mechanism is in practice provided with suitable means for moving roller 28 into and out of working position in timed accord with the working parts of the feed mechanism. The shaft carrying roller 27 may be, if desired, suitably driven from shaft 5, and in turn, by a belt drive or other means, transmit motion to the working parts of the transfer mechanism.

In the example shown in Figs. 4 to 6 the upper free arm of lever 25 is formed as a toothed quadrant 31 in mesh with a pinion 33 mounted on the shaft 32. This shaft 32 also carries a lifting cam 34, upon the circumference of which the roller 18 of lever 16 is adapted to run. Furthermore the shaft 19 carries a lifting cam 35 (Indicated in dotted lines) adapted to cooperate with a roller 36 mounted on the lever 25.

This mechanism operates in the following manner. The continuously rotating ratchet wheel 21, into engagement with the toothed part of which the pawl 22 has been thrown by the impact of the sheet with the feeler 26, carries the pawl along with it and thereby causes the lever 25 to rock, which movement is transmitted to the cam disk 34 by means of the toothed quadrant 31 and pinion 33. The cam disk 34 may be of such a configuration

that it raises the friction wheel the full distance from the bank of sheets, or, in order to balance the mechanism, such disk 34 may be of such configuration that the friction wheel 8 is lifted thereby for a part of its upward movement only from the bank of sheets and further raising of wheel 8 effected by the cam disk 20. The pawl 22 is prevented by the stop 30 from unduly continuing its motion with the ratchet wheel 21 and is thrown out of engagement with the ratchet wheel 21 in consequence of the movement of the lever 25 caused thereby. Finally the lever 25, the pinion 33 and the cam disk 34 are restored by cam 35 to normal position.

In the example shown in Figs. 7 and 8, the shaft 12 carries an arm 37 provided with a roller 47 adapted to run on the circumference of the cam disk 20 mounted on the shaft 19, and arm 37 is linked by means of links 38 and a shaft 39 to an arm 40. The arm 40 is loose on a shaft 41 journaled in the guide cheeks 3 of the machine frame. On this shaft is loosely mounted a toothed wheel 42, which meshes on the one hand with the toothed quadrant 31 of lever 25 and on the other hand with a toothed wheel 43 rigidly mounted on the shaft 39. Also rigidly mounted on shaft 39 is a cam disk 44 the lifting curve of which is kept in contact with a supporting and guide roller 45 by means of the tension spring 14. The configuration of the curve of cam 44 is such that its contact with roller 45 is maintained, notwithstanding rotary movements of the wheel 43 caused by variations in the altitude of the friction wheel 8. The roller 45 is mounted on shaft 46 secured in the guide cheek of the machine.

When, with this arrangement, the pawl 22 is thrown into engagement with the ratchet wheel 21 by the contact of the sheet with the feeler 26, and thereby the quadrant lever 25 is caused to rock, the cam disk 44 is rotated by means of the gears 42, 43. The said cam rolls upon the roller 45, thereby causing the gear wheel 43 to simultaneously roll upwardly for a short distance on the circumference of the gear wheel 42, thus effecting the actuation of the friction wheel control gear to raise the friction wheel 8 from the bank of sheets.

Cam 20 then comes into action on roller 47 and at its highest point lifts the friction wheel to a still further level above the bank of sheets. Subsequently cam 35 becomes operative upon the roller 36 of the quadrant lever 35 and returns the latter to its starting position, thereby reversely rotating gear wheels 42, 43 so as to return cam disk 44 to its starting position in relation to the roller 45. This results without a drop of the friction wheel 8 because at this moment the roller 47 of arm 37 travels upon the highest point of the curve of cam 20.

The example shown in Fig. 9 is distin-

guished from the preceding example (Figs. 7, 8) in that the connection between the control gear 42 and the control member 50 is at all times maintained irrespective of variations in the altitude of friction wheel 8. The control member 50, corresponding to the cam disk 44 of Figs. 7 and 8, is in this case of such curvature that the roller 47^a is during a substantial part of its revolution out of contact with the cam 20. The roller arm 45^a is, on the contrary, in this instance drawn towards the cam 50 by means of tension spring 51 which is attached to it at one end, and to the arm 40 carrying the wheel 42 at its other end, so that the roller 45^a thereof is brought into contact with the cam circumference. The gear wheel 42 meshing with the toothed quadrant 25 rotates the wheel 43 in clockwise direction when the coupling between the lever 25 and the ratchet wheel 21 is established. The cam 50 will thus press the roller arm 46^a downwardly until the roller 47^a contacts with the cam 20 and subsequently actuates the friction wheel control gear. The cam 20 thereafter effects the further raising of the friction wheel. When the quadrant lever 25 has been brought into its starting position by the cam 55, the cam 50 will likewise return to its former position, thereby causing a slight descent of the friction wheel.

Having thus fully described my invention, I claim:

1. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated member for periodically operating the throw-off device, a feeler, means governed by the feeler for actuating the throw-off device, means for coupling said actuating means to the regularly operated member for actuation thereby, and means for positively uncoupling said means from said member upon a predetermined motion of the latter.

2. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated member for periodically operating the throw-off device, a feeler, means governed by the feeler for actuating the throw-off device, a coupling member engageable with the regularly operated member for coupling the feeler and feeder actuating means thereto to move the feeler to sheet releasing position and simultaneously effect the throwing of said throw-off actuating means into operation, and means for positively uncoupling said coupling device from said regularly operated member upon a predetermined motion of the latter.

3. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated member for periodically operating the throw-off device, a feeler, means governed by the feeler for actuating the throw-off device, means for coupling said actuating means to the regularly operated member for actuation thereby, and means for positively uncoupling

said means from said member upon a predetermined motion of the latter, said second-named means being operated during the coupling period by the regularly operated member to move the feeler to a sheet releasing position.

4. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated member for periodically actuating the throw-off device, a feeler, throw-off actuating means governed by the feeler, means for coupling the feeler and said throw-off actuating device to the regularly operated member for moving the feeler to sheet releasing position and simultaneously setting said throw-off actuating device into operation, and means actuated by the regularly operated member for throwing said coupling means out of action upon a predetermined movement of said operating member.

5. The combination with a feeder, and regularly operated means for periodically moving the same to an inoperative position, of a feeler, means governed by the feeler for throwing the feeder out of action, and coupling and uncoupling means for positively connecting the last-named means with and disconnecting it from the regularly operated means at timed periods in the motion of the latter.

6. In a sheet separating mechanism, the combination with a feeder, and normally acting feeder throw-off mechanism operated at predetermined periods, of a feeler, and throw-off mechanism governed by the feeler including means for coupling said throw-off mechanism to the normally operating throw-off mechanism for actuation thereby and positively releasing said coupling means upon a predetermined motion of said normally operating throw-off mechanism.

7. In a sheet feeding mechanism, a sheet separator for action on a bank of sheets, a throw-off device, a feeler movable under impact of a separated sheet, an actuating member, coupling means adapted to be connected by movement of the feeler to the actuating member for a working action during a predetermined portion of the working movement of said actuating member, means operable by said control members to impart throw-off motion to the throw-off device, and means operable by said actuating member for periodically operating the throw-off device.

8. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated actuating member, a cam actuated thereby to periodically operate the throw-off device, a second cam for operating the throw-off device, a feeler, and means operative by movement of the feeler for operating the second-named cam from said actuating member.

9. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated cam for periodically actuating the throw-off

device, a second cam for operating the throw-off device, normally idle operating means for actuating the second-named cam, and feeler controlled means for coupling the said operating means for movement with the first-named cam during a predetermined portion of the orbit of motion of the latter.

10. In a sheet separating mechanism, a feeder, a throw-off device, regularly operated means for periodically actuating the throw-off device, and sheet controlled means for operating the throw-off device under certain conditions, the said regularly operated and sheet controlled means having such relative action as to always maintain coactive working relationship between the throw-off device and the regularly operated actuating means.

11. In a sheet separating mechanism, a feeder, a throw-off device, regularly operated means including a cam for actuating the throw-off device, sheet controlled means including a cam for operating the throw-off device, the latter-named cam having a working throw on the throw-off device maintaining said throw-off device always in position to be operated by the cam of the regularly operated actuating means.

12. In a sheet separating mechanism, a feeder, a throw-off device, sheet controlled means including a cam for raising the feeder to a predetermined degree from the bank of sheets, and regularly operated means including a cam for periodically engaging and operating the throw off device to raise the feeder to a greater degree from the bank of sheets.

13. In a sheet separating mechanism, a feeder, a throw-off device, regularly operated means for periodically actuating the throw-off device, and feeler controlled means for operating the throw-off device, the said feeler controlled means being operative on the throw-off device while maintaining said device in position to be operated by the regularly operated means.

14. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated actuating member, a cam operated thereby for periodically engaging and operating the throw-off device, a feeler, a second actuating device, a cam operated thereby for engaging and operating the throw-off device, coupling means controlled by the feeler for connecting the second actuating device with the first actuating device for actuation thereby, and means for throwing said coupling device positively out of action on a predetermined motion of the first actuating device.

15. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated actuating member, a cam actuated thereby to periodically actuate the throw-off device, a feeler, a second actuating device, a cam actuated thereby to actuate the throw-off device, a feeler controlled coupling for

operatively connecting the second actuating device with the regularly operated actuating device, and positively operating means for throwing said coupling device out of operation.

16. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated actuating member, a cam actuated thereby to periodically actuate the throw-off device, a feeler, a second actuating device, a cam actuated thereby to actuate the throw-off device, the second-named cam being operative on the throw-off device without rendering the same inoperative by the first-named cam, a feeler controlled coupling for operatively connecting the second actuating device with the regularly operated actuating device, and positively operating means for throwing said coupling out of operation and retracting the feeler and second actuating device.

17. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated actuating member, a cam actuated thereby to periodically actuate the throw-off device, a feeler, a second actuating device, a cam actuated thereby to actuate the throw-off device, a feeler controlled coupling for operatively connecting the second actuating device with the regularly operated actuating device, the second-named cam being operative on the throw-off device without rendering the same inoperative by the first-named cam, and means for rendering said coupling inoperative and retracting the feeler and second actuating device.

18. In a sheet separating mechanism, a feeder, a throw-off device, a pair of cams for independently actuating the throw-off device, and regularly operated and sheet controlled means for respectively effecting the actuation of said cams, both cams being constantly in working connection with the throw-off device.

19. In a sheet separating mechanism, a feeder, a throw-off device, a pair of cams for independently actuating the throw-off de-

vice, periodically operated means for actuating one of said cams, sheet-controlled means operative by a separated sheet for actuating the other cam for a predetermined period and through the same source of power as the first-named cam, and means for maintaining both cams constantly in working relationship relative to the throw-off device.

20. In a sheet separating mechanism, a feeder, a throw-off device, a driven shaft, a cam on said shaft for periodically actuating the throw-off device, a second cam for actuating the throw-off device, a rocker element, means controlled thereby for actuating the second cam, a ratchet wheel on the shaft, a feeler pivotally mounted on the rocker element, a pawl movable by said feeler when the latter is moved by impact of a sheet into engagement with the ratchet wheel, and a contact on the shaft for disconnecting the pawl from the ratchet wheel.

21. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated member for periodically operating the throw-off device, a feeler, a second member for operating the throw-off device, feeler operated means for coupling said second member to the regularly operating member for actuation thereby, and means for positively uncoupling said coupling means from said regularly operated member upon a predetermined motion of the latter.

22. In a sheet separating mechanism, a feeder, a throw-off device, a regularly operated member for periodically operating the throw-off device, a feeler, a second member for operating the throw-off device, feeler operated means for coupling said second member to the regularly operating member for actuation thereby, said coupling means being operative during the coupling period by the regularly operating member to move the feeler to a sheet releasing position.

In testimony whereof I affix my signature.

GEORG SPIESS.