Nov. 10, 1931. C. C. J. WEBER 1,830,818

SHEET LAYING-ON MACHINE

Filed Jan. 25, 1929 3 Sheets-Sheet 1

Fig. 1.

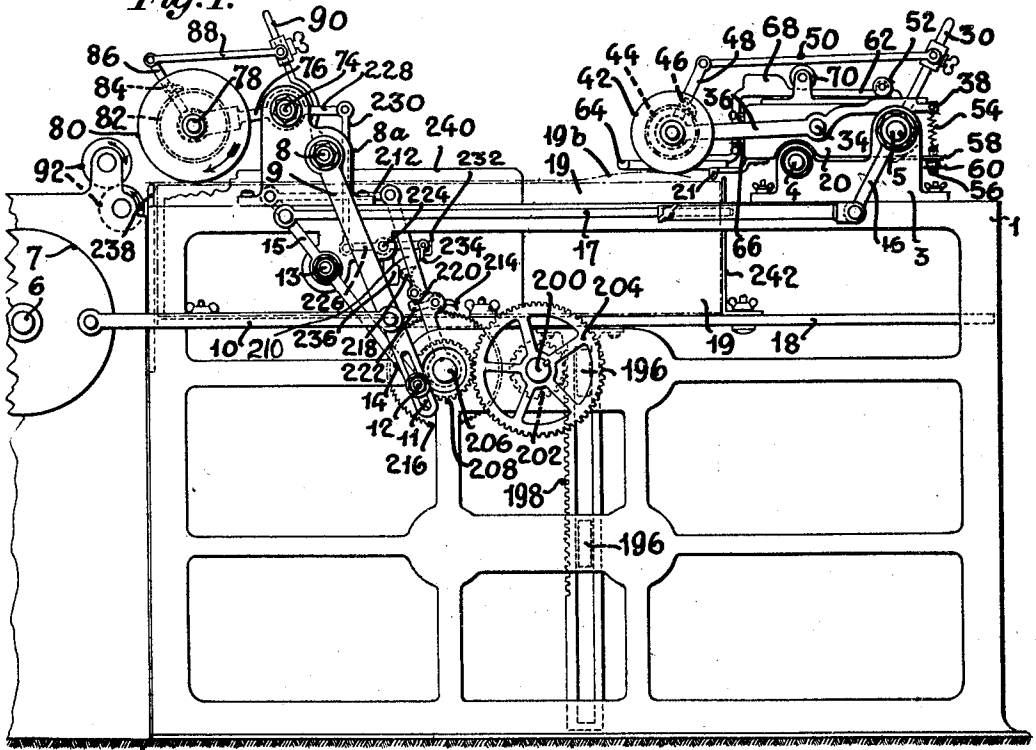
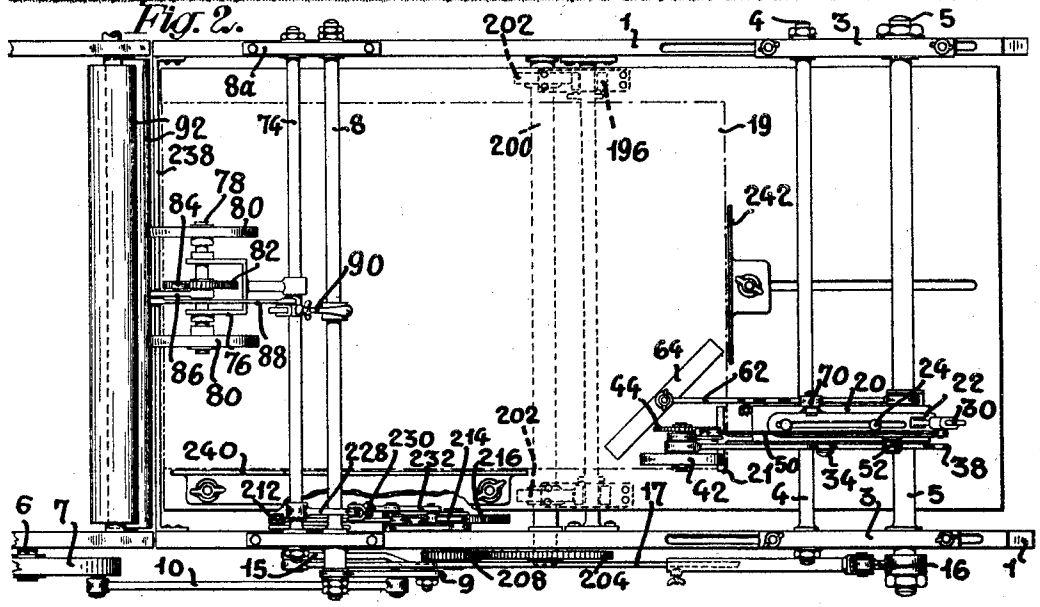


Fig. 2.



C. Ch. J. Weber
by C. F. Vogel
his Attorney.

Nov. 10, 1931. C. C. J. WEBER 1,830,818

SHEET LAYING-ON MACHINE

Filed Jan. 25, 1929 3 Sheets-Sheet 2

Fig. 3.

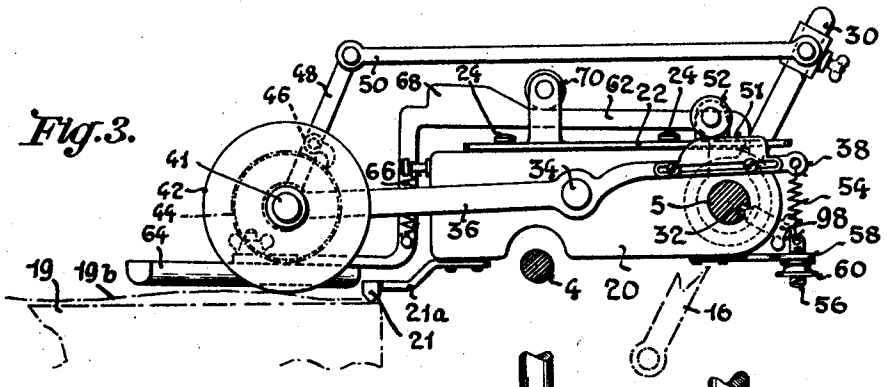


Fig. 4.

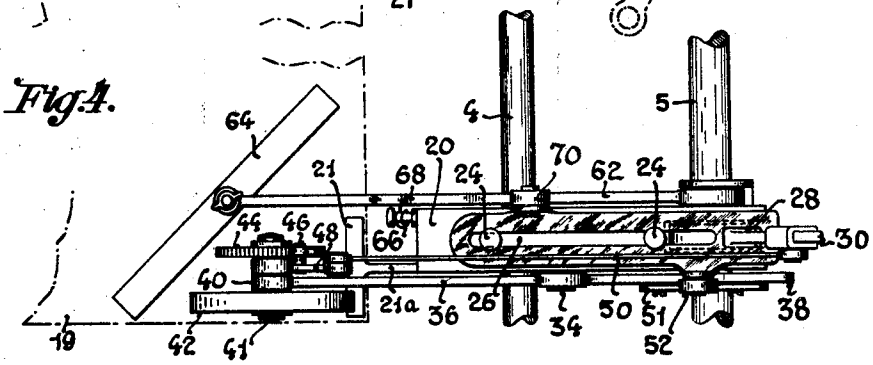


Fig. 5.

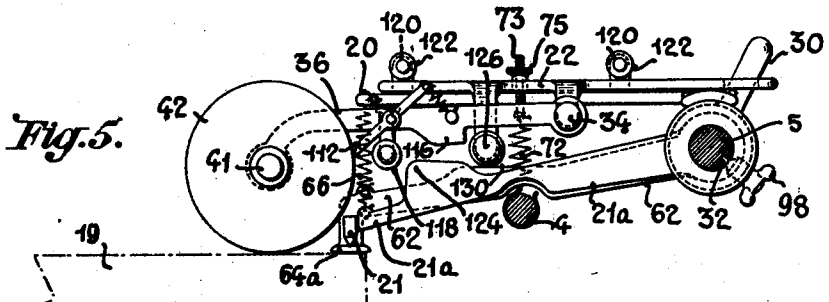
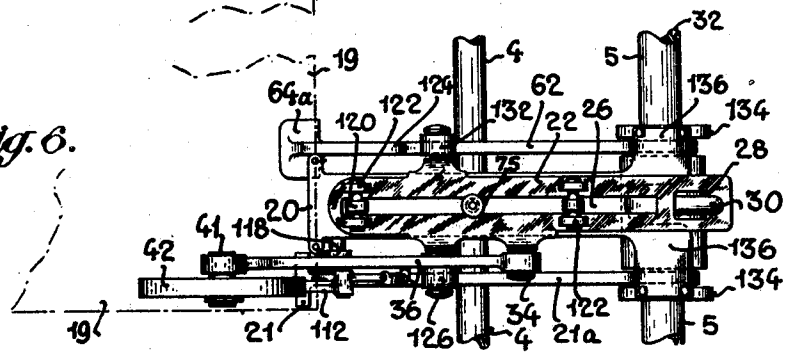


Fig. 6.



C. Ch. J. Weber

by C. F. Gregel

his Attorney.

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SHEET LAYING-ON MACHINE

Filed Jan. 25, 1929 3 Sheets-Sheet 3

Fig. 7.

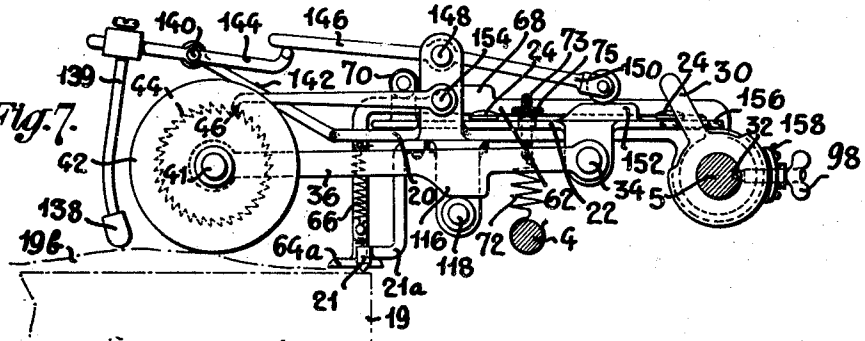


Fig. 8.

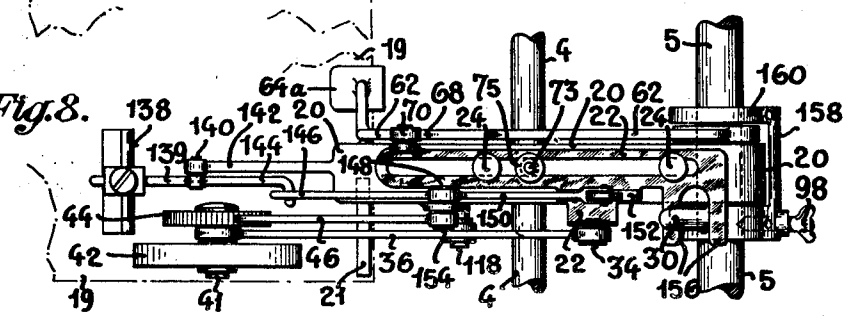


Fig. 9.

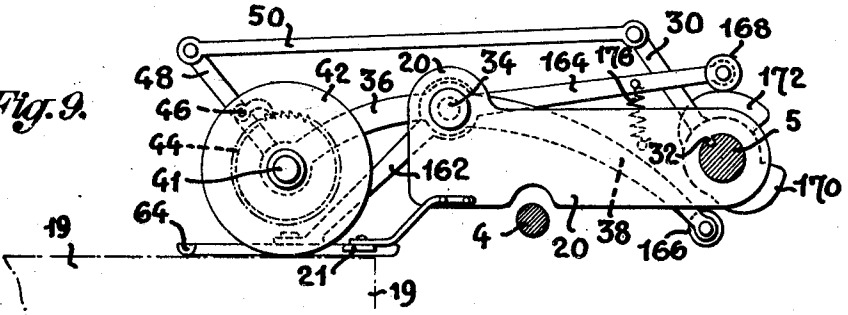
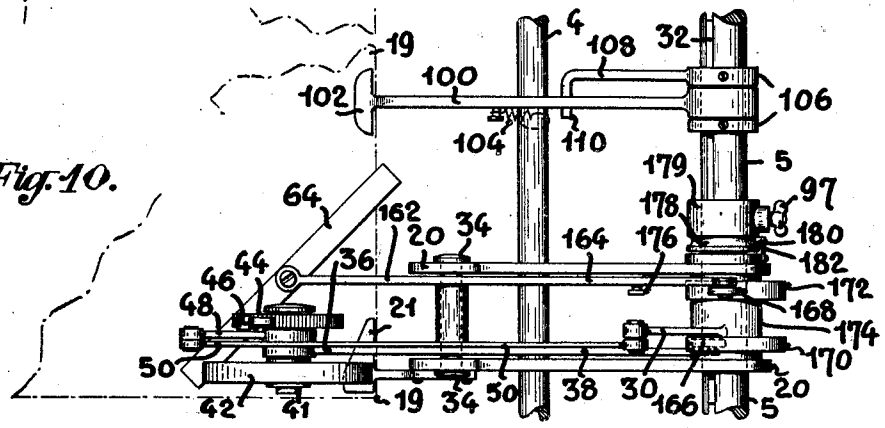


Fig. 10.



C. Ch. J. Weber
by C. F. Gregel
his Attorney.

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UNITED STATES PATENT OFFICE

CARL CHRISTIAN JULIUS WEBER, OF ODENSE, DENMARK

SHEET-LAYING-ON MACHINE

Application filed January 25, 1929, Serial No. 334,884, and in Germany January 30, 1928.

The present invention relates to a sheet-laying-on machine, which consists partly of an apparatus for freeing the sheets one at a time from a pile of sheets, and partly of an apparatus for advancing the sheet thus freed to a printing machine, ruling machine or the like. The invention consists essentially in this that the freeing apparatus is provided with a rubbing-up roller which serves in known manner to rub up a bulge in the uppermost sheet of the pile, and with two fingers which alternately press against the upper side of the pile, the one finger acting on the uppermost sheet during the rubbing-up process whilst the other finger acts on that part of the next uppermost sheet which has been bared by the uppermost sheet having been moved forward in being rubbed-up.

The rubbing-up roller consists of or is covered on its periphery with rubber or the like which has a high coefficient of friction to paper and the like. It is pivotally arranged in bearings in an arm which can either be raised or lowered, whereby the roller is lifted up from or goes down onto the uppermost sheet, or is pushed with a rectilinear movement forward and backward. In the former instance the rubbing-up roller is intermittently set into rotation at the moment the roller comes into contact with the uppermost sheet, and the rotation proceeds by aid of a pawl gear of some suitable form. In the latter instance the freely revoluble rubbing-up roller is caught at the moment the rubbing-up shall be performed. The roller will therefore drag on the uppermost sheet and will thereby pull the same along, whereby the rubbing-up of the bulge is effected.

As a rule the apparatus is fitted at the one or at both back corners of the pile of paper, and on the bulge being rubbed up the respective corner of the uppermost sheet is pulled forward a little whereby a small area of the next uppermost sheet is bared. Onto this small bared area the one of the two fingers will immediately strike down and thereby the next uppermost sheet and thus the whole pile will be held in position whilst the uppermost sheet is being advanced.

The apparatus may be fitted with a bulge limiting member, i. e. a member which during the rubbing-up operation is pressed down onto the uppermost sheet in front of the rubbing-up roller, and which prevents the bulge from spreading in a horizontal direction. This function may be performed by the finger acting on the uppermost sheet.

The apparatus serving to advance the freed sheet consists of two or more rollers of rubber or the like which at suitable moments are rendered dragging whereby the sheet is dragged along and is with its front edge introduced into a feeder which takes it to such place where it shall be used.

The two apparatus are driven each by its own backwards and forwards rocking shaft which are, however, connected to one another and are driven by a common motor.

In the a companying drawings a number of constructional forms are shown, in which

Fig. 1 shows a machine of the kind described, in side elevation, partly in section,

Fig. 2 the same, seen from above,

Fig. 3 is a side elevation of the sheet freeing apparatus on a larger scale,

Fig. 4 the same, seen from above,

Fig. 5 shows another constructional form of the sheet freeing apparatus, in side view,

Fig. 6 is the same, seen from above,

Fig. 7 is a third constructional form of the sheet freeing apparatus, in side view,

Fig. 8 is the same, seen from above,

Fig. 9 is a fourth constructional form of the sheet freeing apparatus, in side view,

Fig. 10 the same, seen from above.

In the drawings the numeral 1 indicates two parallel walls on the top of which there are two slides 3 which are connected to each other by means of a bolt 4, and which can be slid by aid of suitable means along the walls and fixed thereto. In the two slides there are provided bearings for a rocking shaft 5, which by means of a suitable motor is put into a rocking movement the motor driving a shaft 6 with a disk 7 which is connected to the rocking shaft by means of the following mechanism.

On the walls 1 there are fitted suitable bearing blocks 8*a* with bearings for a revoluble shaft lying across the walls and

carrying a lever 9 which by means of a connecting rod 10 is connected to the disc 7. The lever 9 has a slot 11. On the one of the walls 1 there is a pin 13, around which pivots a lever 14, 15, the one arm 14 of which has a pin 12 sliding in the slot 11, while the other arm 15 of the lever is connected by means of a connecting rod 17 to an arm 16 on the rocking shaft, which connecting rod 17 consists of two sections adjustable relatively to each other, so that its length can be varied relatively to the momentary position of the slides 3 on the walls. When the connecting rod 10 is moved from the right to the left (Fig. 1), the arm 16 will be turned in the dire tion from left to right, and when the disc 7 revolves continuously, the shaft 5 will thus rotate forwards and backwards, i. e. rock to and fro.

Between the walls there is arranged a horizontal, plane table 18 on which lies the pile of paper 19 from which the sheets shall be freed one by one and be advanced one sheet at a time to the machine, e. g. a printing machine or a ruling machine, in which the sheet shall be further treated.

The sheet freeing apparatus. Figs. 1–4

To the rocking shaft 5 there is pivotally fitted a block 20 to the underside of which there is secured an arm 21*a* which with a foot formed like a finger 21 can step down onto the top of the pile, and the block thus rests partly on the rocking shaft 5, which during the operation of the machine is turned to and from in a bore in the block, and partly on the pile 19. The upper side of the block is plane and on it there lies a slide 22 which can be slid to and fro on the block, guided by two pins 24 fitted in the block which pins engage in a slot 26 in the slide 22. The back end of the latter extends beyond the back edge of the block and has a hole 28, through which there is passed an arm 30 which grips the rocking shaft and has a tooth or the like which engages into a continuous groove 32 in the rocking shaft so that the arm 30 will follow the rocking motion of the latter whereby the slide 22 is thus slid to and fro on the block. To the side of the latter there is secured a pin 34 which serves as fulcrum for a double-armed lever 36, 38. The arm 36 has a bearing 40 for a revoluble shaft 41 on the one end of which there is fitted a disk 42 covered with rubber or the like, and on the other end a pawl wheel 44 into which engages a pawl 46 fitted on an arm 48 pivoting on shaft 41, which arm is by means of a connecting rod 50 connected to the arm 30.

On the other arm 38 of the double-armed lever there is an adjustable cam 51, the upper edge of which, which has a suitable forward incline, bears against a roller 52 on a pin on the slide 22. When the slide 22 is moved to the right (Fig. 1) the roller 52 will therefore act on the cam 51 and the arm 38 will be pressed downwards whereby the roller 42 will be lifted up from the pile 19 and its uppermost sheet. The weight of the roller 42 is counterbalanced by a spring 54 acting on the arm 38, the lower end of which spring is secured to an adjusting screw 56 which is passed through a fixed arm 58 on the block 20 and has a nut 60.

At the side of block 20 there is an arm 62 engaging with an eye around the rocking shaft 5, said arm being bent along the upper side of the block 20 and thereafter down along its front edge, where it carries a foot 64 adapted to step on to the top of the pile 19 and to act alternately with the finger 21. The foot 64 has a semicircular cross section and can be turned around a vertical pin on arm 62 so that it can be made to assume a suitable inclined position relatively to the shaft 41.

The weight of the arm 62 is supported by a spring 66 the upper end of which is secured to the block 20, and on the top of the said arm there is a cam 68. On the slide there is a pin with a roller 70 which will when the slide is moved to the left (Fig. 1), ride up the cam 68, whereby the arm 62 with finger 64 is pressed down. When the slide 22 is again moved to the right, the cam 68 will be free of the roller 70 and the spring 66 will now lift the finger 64.

Sheet advancing apparatus. Figs. 1 and 2

In the bearing blocks 8*a* (Fig. 2) there are above the bearings for the shaft 8 provided bearings for a shaft 74 on which there is rigidly fitted a fork 76, between the two bifurcations of which there are bearings for a revoluble shaft 78 to the ends of which there are fitted two or more disks 80 covered with rubber or the like and a pawl wheel 82 into which latter a pawl 84 engages fitted to an arm 86 pivoting on shaft 78. To this arm there is pivoted a connecting rod 88 which is secured to an arm 90 fitted on the shaft 8.

Immediately in front of the table 18 and on a level with the upperside of the pile of sheets there are arranged two parallel rollers 92 which lie the one above the other and are kept in continuous and rapid rotation in the directions shown by the arrows in Fig. 1.

The above described devices cooperate in the following manner: The sheet freeing apparatus is adjusted in such a manner that the roller 42 is close to the upper back corner of the pile 19, as shown in Fig. 2, and this adjustment is performed by shifting the slides 3 on the walls 1 and the block 20 on the rocking shaft 5.

In the position of the devices shown in the drawings (Figs. 1 and 2), the rocking shaft with arms 16 and 30 is in its one extreme position, and the arms 9 and 90 are in their extreme position corresponding thereto. The

rubbing-up roller 42 and the finger 64 are raised from the pile 19 into the uppermost sheet 19*a* of which a bulge 19*b* has been rubbed up, whereby there has been bared an area of the next uppermost sheet onto which steps the finger 21 which for the moment bears the greater part of the weight of the block 20 so that the next uppermost sheet is held in position and the pile is steadied. The pawl gear for the rollers 80 of the advancing apparatus is ready to turn these in the direction of the arrow whereby the uppermost sheet will be advanced to the left so that the sheet can be seized by the feed rollers 92 which will immediately take it away from the pile so that the next uppermost sheet will now become the uppermost.

This taking away of the uppermost sheet occurs as soon as the arm 9 is being moved to the left by aid of the connecting rod 10, the pawl gear 82, 84, 86 imparting to the roller 80 the rotation necessary therefor.

Simultaneously as the arm 9 is turned, also the arm 14 is turned, its pin 12 sliding in the slot 11 and the shaft 5 is thereby turned counter-clockwise. The arm 30 will then move the slide 22 to the left whereby the roller 52 will roll down the inclined edge of cam 51 so that the lever 36, 38 now can turn until the rubbing-up roller 42 again steps onto the now uppermost sheet 19*a* of the pile. By the movement of the arm 30 the arm 48 with the pawl 46 is turned, and the latter slides over the teeth of the pawl wheel 44.

When the slide 42 is pushed to the left the roller 70 has rolled up the cam 68 whereby the arm 62 with the finger 64 has been pressed down, the spring 66 being tightened. The relative dimensions are chosen such that the finger 21 is lifted from the uppermost sheet at the moment the finger 64 goes down on it, and the respective members will then assume the hereinbefore described position in which everything is ready for rubbing-up a bulge in the uppermost sheet, when the rocking shaft reaches its other extreme position.

When the rocking shaft thereafter moves back towards the first extreme position shown in the drawings, the following will occur: The arm 48 will with the pawl 46 immediately carry along the pawl wheel 44 whereby the rubbing-up roller 42 will be turned clockwise and a bulge 19*b* will therefore be rubbed up so that behind the roller 42 a piece of the next uppermost sheet is bared.

During the rubbing-up process the finger 64 will continuously step on the uppermost sheet a small distance in front and slanting to the right (Fig. 2) of the rubbing-up roller so that the finger lies slanting across the corner of the sheet, and the finger will therefore, besides as finger, serve to limit the spreading of the bulge, what has proved in practice as being of great importance for the freeing of the sheet fom the pile.

When the arm 30 has, however, moved the slide 22 so far to the right that the roller 70 has rolled down the cam 68, the spring 66 will immediately raise the arm 62 with the finger 64 whereby the weight of the block 20 will be transferred to the finger 21 which at once steps down onto the bared part of the next uppermost sheet, and which is now the only active finger. At the same time the roller 52 will roll up onto the bevel edge of the cam 51 whereby the rubbing-up roller 42 is lifted.

The arm 90 on the shaft 8 has during this period of movement travelled counter-clockwise and the pawl 84 has moved free over the teeth in the pawl wheel 82 so that all movable parts will now again assume the initial position shown in Figs. 1 and 2.

On the rocking shaft there can be freely revoluble the arm 100 shown in Fig. 10, which arm 100 bears an auxiliary finger 102 which is pressed on the uppermost sheet close to the back edge of the pile and immediately at the side of the finger 64, as being under action of a spring 104 which is fitted to the shaft 4. The eye of the arm 100 encircling the rocking shaft is held in its position by two collars 106 fixed to the rocking shaft. The one of the said collars bears an arm 108 which with a bend passes in under the arm 100, so that the latter and thus the auxiliary finger 102 can be lifted at a suitable moment by the clockwise stroke of the rocking shaft, whilst the auxiliary finger again steps down on the back edge of the uppermost sheet when the rocking shaft rocks into the opposite direction.

In the constructional form of the freeing apparatus shown in Figs. 5 and 6 the pivoting pin 34 for the lever 36, which bears the pin 41 of the rubbing-up roller 42, is fitted pivotally on the slide 22 and the roller 42 therefore receives a rectilinear movement to and fro together with the slide. When the roller is moved to the left (Fig. 5) its rotation is prevented by a small blade 112 pivoted to the arm 36, the edge of which blade is by a spring pressed against the periphery of the roller 42 and the latter will therefore glide on the uppermost sheet, whereby the rubbing-up of the roller is effected. By this arrangement all pawl-gear is obviated. On the underside of the lever 36 there is a cam 116, which, when the roller 42 is approaching its extreme position to the left, abuts against a roller 118 on the block 20. The cam 116 is so formed that during the remainder of its movement to the left the roller 42 is lifted from the uppermost sheet.

The plane top side of the block 20 is provided with two uprights 120 which pass through the slot 26 and which bear shafts for the rollers 122 which rest on the top of the

slide 22 and thereby act to guide the travel of the slide.

The arm 21*a* of the finger 21 is not fixed to the block 20 but encircles with an eye the rocking shaft 5 and is freely revoluble on the same. On the top of arm 21*a* there is a cam 124 against which abuts a roller 126 on the slide 22 during the travel of said slide to the left, whereby the finger 21 can be pressed against the top of the pile at a suitable moment. When the roller 126 is not operative on the cam 124, a spring 66 will lift the finger from the pile.

The arm 62 of the other finger is likewise pivotable on the rocking shaft 5 and has a cam 130 on which may act a roller 132 (Fig. 6) fitted on the slide 22. This finger has the shape of a plate 64*a* which rests on the uppermost sheet rather close to its back edge. The arm 62 may be lifted by a spring corresponding to spring 66.

The eyes with which the two finger arms grip around the rocking shaft are held up to the sides of the block 20 by aid of two collars 134 arranged on the shaft outside of the eyes (Fig. 6) which collars are secured to the block 20 by means of projections 136.

In the constructional form of the freeing apparatus shown in Figs. 7 and 8 the rubbing-up of the bulge is effected in the same manner as in Figs. 5 and 6, the roller 42 being moved together with the slide 22 and being lifted while the cam 116 runs on the roller 118 fitted to the block 20. The finger 21 is, as in Figs. 3 and 4, secured to the block 20, whilst the arm 62 of the finger 64*a* is pivotally arranged on the rocking shaft 5. In this constructional form a special bulge limiter is shown which consists of a bar 138 which is fitted to the one arm 139 of a double armed lever which pivots around a pin 140 on an arm 142 fitted to the block 20. The other arm 144 of the double armed lever is adapted to be actuated by the one arm 146 of another double armed lever pivoting on a pin 148 on block 20, the other arm 150 of which may be acted on by a cam 152 on the slide 22.

The rubbing-up roller 42 is rotated by means of the pawl-wheel 44, but the pawl-gear is of a more simple design than that shown in Figs. 5 and 6. The pawl 46 is namely pivotally fitted to a pin 154 which is provided in the block 20. When the roller 42 is moved to the left (Fig. 7) the pawl 46, which does not participate in this movement, will hook fast in the pawl-wheel 44, whereby the rubbing-up roller 42 turns clockwise so that a bulge is rubbed-up.

The arm 30 is passed up in the space 26 between two projections 156 at the side of the slide 22, and the eye with which the arm 30 grips the rocking shaft, is by means of a plate 158 connected to a ring 160 which encircles the rocking shaft and serves to guide the finger arm 62 close to the block 20.

The tension of spring 72 may be regulated by a screw 73 and nut 75.

In the constructional form of the freeing apparatus shown in Figs. 9 and 10 the block 20 consists of two plates which at the one end are pivoted to the rocking shaft and which are held together by aid of the pin 34, on which the double armed lever 36, 38 is pivoted. The lever arm 36 bears the former mentioned shaft 41 with the rubbing-up roller 42 and the pawl-wheel 44. The arm 48 with the pawl 46 is pivoted on the shaft 41 and is by means of a connecting rod connected to the arm 30 fitted on the rocking shaft 5. The finger 21 is fixed to the one of the plates 20, while the finger 64, which here at the same time serves as bulge limiter in Figs. 1–4, is arranged on the one arm 162 of a double armed lever pivoted on pin 24, the other arm of which is marked 164. The arms 38 and 164 bear rollers 166 and 168 which can roll on cam disks 170 and 172 which are fitted on a sleeve 174 which grips around the rocking shaft and engages the groove 32. The sleeve 174 also serves as a distance piece between the two plates 20. The roller 168 is held pressed against the cam disks 172 by means of a spring 176 acting on the arm 164. The shape of the cams 170 and 172 is such that the rubbing-up roller 42 and the finger 64 are lifted and lowered at the right moments.

The one of the two plates forming the block 20 can as before be displaced along the rocking shaft and can be adjusted as desired to the pile 19. The fixing of the place of the block may be effected by a loose ring 176 which can be clamped to the rocking shaft by means of a set screw 98, and which has an annular groove 178 of semicircular section into which can engage a small ball 180 which is secured to a resilient arm 182 on the block 20. The latter can thus be turned on the rocking shaft 5 and yet preserve the position close to the ring 176 clamped to the rocking shaft.

By this arrangement the block 20 may be displaced away from the ring 176, as the resilient connection between the ball 180 and the groove 178 can readily be broken by a simple undoing. The block may thereafter be quite pushed aside and again readily be made to assume its previous position when it is pushed close to the ring 176 as the resilient connection is by itself made again.

Gradually as the sheets are taken off the height of the pile 19 will decrease and as the top of the pile should always remain in the same level the table must be automatically raised at the same speed with which the height of the pile is reduced. In order to obtain this, the table is arranged on two racks 198 guided in links 196 into which racks two pinions 202 will mesh fitted on a revoluble pin 200. The pin 200 bears further a toothed wheel

cludes bearing blocks (3) which are shiftable and adjustable on the walls (1) of the machine.

6. In the sheet laying-on machine described in claim 1, the arrangement that the rocking shaft (5) for the freeing apparatus has a continuous groove (32) into which engages a set screw (98) or the like which is screwed into an eye on the arm (62) encircling the shaft (5) so that the block (20) can be shifted along the shaft and the arm (30) can remain permanently in connection therewith.

7. Sheet laying-on machine as described in claim 1, characterized in this, that the apparatus for advancing the sheets freed consists of two rollers (80) fitted to a revoluble shaft (78), said roller being made of rubber or the like, said shaft (78) bearing a pawl wheel (82) and being journalled in bearings in a fork (76) which is fitted to a shaft (74) journalled in bearing blocks (8a) on the walls (1) of the machine, while on a shaft (8) journalled under the shaft (74) in the bearing blocks (8a) there is fitted an arm (90) by means of which a pawl gear (82, 84, 86, 88) may be actuated, whereby the rollers (80) are revolved for advancing the freed sheet, which shaft (8) is a rocking shaft driven by a suitable motor in opposite time with the rocking shaft (5).

8. A machine of the character described comprising, in combination, means for supporting a stack of sheets, means for removing the sheets from the top of the stack, one by one, means for rubbing up each sheet as it is to be removed to thereby reveal the next succeeding sheet, comprising a rock shaft with a block, a slide controlled by the rock shaft, a pivoted lever on the block carrying a rubbing-up wheel and controlled by the slide to cause the wheel to engage the uppermost sheet, means under the control of the rock shaft controlling the operation of said wheel for rubbing up the sheet engaged thereby and means carried by the block for engaging the revealed portion of the next succeeding sheet so as to maintain the stacked sheets in place during the removal of the rubbed-up sheet.

9. A machine of the character described comprising, in combination, means for supporting a stack of sheets, means for removing the sheets from the top of the stack, one by one, means for rubbing up a bulge in each sheet as it is to be removed to thereby reveal the next succeeding sheet, comprising a rock shaft with a block, a slide controlled by the rock shaft, a pivoted lever on the block carrying a rubbing-up wheel and controlled by the slide to cause the wheel to engage the uppermost sheet, means under the control of the rock shaft controlling the operation of said wheel for rubbing up the sheet engaged thereby, means under the control of the slide to limit the spread of the bulge, and means for holding the stack of sheets in place during the removal of the bulged sheet.

10. In a machine of the character described, embodying means for advancing the uppermost sheet from a stack of sheets, means for freeing the uppermost sheet to be advanced, comprising a revoluble roller adapted to engage the uppermost sheet and, when revolved, to rub and bulge up a portion thereof, revealing thereby a portion of the next succeeding sheet in the stack, means for supporting and operating said roller comprising a rock shaft with a block, a slide controlled by the rock shaft, a pivoted lever on the block carrying the roller and controlled by the slide to cause the roller to engage the sheet, means controlled by the rock shaft controlling the revolving action of the roller, means under the control of the slide in cooperation with the revolving action of the roller for limiting the spread of the bulged-up portion, and means for engaging the revealed portion of the next succeeding sheet.

11. In a machine of the character described, embodying means for advancing the uppermost sheet from a stack of sheets, means for freeing the uppermost sheet to be advanced, comprising a revoluble roller adapted to engage the uppermost sheet and, when revolved, to rub and bulge up a portion thereof, revealing thereby a portion of the next succeeding sheet in the stack, means for supporting and operating said roller comprising a rock shaft with a block, a slide controlled by the rock shaft, a pivoted lever on the block carrying the roller and controlled by the slide to cause the roller to engage the sheet, means controlled by the rock shaft controlling the revolving action of the roller, and two fingers cooperating with the roller upon the stack of sheets and having alternate operation, one finger being under the control of the slide and arranged to act on the uppermost sheet to limit the spread of the bulge produced by the roller, and the other finger being arranged on the block to act on the revealed portion of the next succeeding sheet.

12. In a machine of the character described, the combination with a rockshaft, of a block arranged for movement, a slide whose movement is effected by the rockshaft slidable upon the block and controlling means for causing movement of the block, a lever mounted to the block for pivoting movement and carrying a rotatable wheel, and means for rotating said wheel from said rockshaft, comprising linkage connected to the rockshaft and a pawl and ratchet connection between the linkage and rotary wheel.

13. In a machine of the character described, a rockshaft, a block suspended at one end from the rockshaft and provided at the other end with a finger adapted to rest on a stack of sheets, a double armed lever pivoted

204 which is in mesh with another toothed wheel 208 on another revoluble pin 206. On the pin 206 a pivotal lever 210 fits loose which by means of a connecting rod 212 is connected to the aforementioned lever 15 which during the working of the machine rocks to and fro on shaft 13 and thus carries the arm 210 along in this movement.

On the arm 210 there is fitted a pawl 214 pivoting on a pin and adapted to engage a pawl-wheel 216 on the shaft 206. When the arm 210 is turned clock-wise and when the pawl engages the pawl-wheel, the said wheel gear will be turned in the direction of the arrows whereby the table 18 will be raised a suitable distance.

The pawl 214 can be held in the lifted position shown in Fig. 1 by means of a small double-armed lever 218, 220 pivoted on a pin secured to the arm 210 when the arm 220 is at rest on a finger 222 secured to the pawl 214.

A rotatable lever is provided on a pin 224 on the walls of the machine the one arm 226 of which lever is connected by means of a connecting rod 230 to an arm 228 fitted on the shaft 74, while the other arm 232 bears a nose 234 which when the arm 232 is moved downwards can come into the path of the arm 218 when this arm swings to the right together with the arm 210.

When the top of the pile of papers is in its usual level the members mentioned will assume the position shown in Fig. 1. The arm 210 will rock to and fro without the pawl 214 taking the wheel gear along. When the height of the pile of papers now decreases the transport rollers 80 will sink a little whereby the shaft 74 will be turned a little and the double-armed lever 226, 232 will be turned a little clockwise so that the nose 234 will come into the path of the arm 218. The latter will therefore turn counter-clockwise until it meets a suitable stop and the pawl 214 will then under the effect of a suitable spring engage the pawl-wheel 216 so that the wheel gear is turned and the table 18 is raised so much as corresponds to the stroke of the arm 210. When the arm 210 again rocks back, the arm 218 will abut against a fixed stop 236 whereby it will be turned up into the position shown in the drawings. As long as the top of the pile of paper is below its usual level the table 18 will be lifted a certain distance at each stroke of the arm 210. But when the usual level has been reached the lever 226, 232 will again assume the position shown in Fig. 1 in which the arm 210 moves idly.

To the front there is on the frame of the machine a plate 238 against which the forward edge of the pile 19 is resting and on the table 18 there are at the one side of the pile and at its back provided angle plates 240 and 242 which can be adjusted in grooves in the table and can there be fixed corresponding to the width and length of the pile of paper with which work is proceeding at the moment.

I claim:

1. Sheet laying-on machine, which consists partly of an apparatus for freeing the sheets one by one from a pile of paper and partly of an apparatus for advancing the freed sheets one by one to a printing machine, ruling machine or the like, characterized in this, that the freeing apparatus comprises in its construction a mechanism mounted to have rocking movement and including a lever (36) carrying at one end thereof a rubbing-up roller (42) means for rocking the mechanism and connections therewith including a ratchet and pawl for causing rotative movement of said roller, and two fingers (21 and 64) carried by said mechanism to alternate in pressing down on to the top of the pile (19), the one finger (64) operating independently and operated from said rocking means to act on the uppermost sheet while the rubbing-up process is proceeding, and the other finger (21) acting on that part of the next uppermost sheet which has been bared by the rubbing-up process.

2. Sheet laying-on machine as described in claim 1, characterized in this, that the sheet freeing apparatus consists of a shaft (5) rocking to and fro, which is journalled in bearing blocks (3) on the walls (1) of the machine on which shaft there is suspended the one end of a block (20) the other end of which bears the finger (21) which rests on the pile of paper (19), on which block end there is fitted a pin (34) on which a double armed lever (36, 38) is pivoted, the one arm (36) of which has a bearing for a revoluble shaft (41), which bears the rubbing-up roller (42) and a pawl gear which is driven by an arm (30) on the rocking shaft (5), while on the top of the block (20) there is fitted a reciprocating slide (22) which is moved by aid of the arm (30) and which bears a roller (52) which can actuate the arm (38) so that the roller (42) is lifted.

3. In the sheet laying-on machine described in claim 1, the arrangement of an arm (62) turnable at the side of the block (20) on the rocking shaft (5), which arm bears the finger (64) and which has a cam (68) adapted to be actuated by a roller (70) fitted on the slide (22), which arm (62) is lifted by a spring (66) fitted in the block (20).

4. Sheet laying-on machine as described in claim 1, characterized in this that the finger (64) consists of a bar or the like with a semi-circular or similar section and which is revoluble on the arm (62) around a vertical axis, which finger can assume an oblique position relatively to the shaft (41).

5. In the sheet laying-on machine described in claim 1, characterized in this that the support for the freeing apparatus in-

to the block, a revoluble shaft having bearing in one arm of said lever and carrying a rubbing-up roller adapted to engage and bulge up a portion of the topmost stacked sheet, a projecting arm controlled by the rockshaft controlling a pawl and ratchet mechanism for operating the rubbing-up roller, a slide on the block actuated by said projecting arm, and means on the slide for engaging and actuating said double armed lever so as to give said rubbing-up roller a lifting action.

14. In a machine of the character described, the combination with apparatus for advancing freed sheets from a stack of sheets, of mechanism for freeing the sheets for advancement, its construction including a rock shaft with a block, a slide whose movement is effected by the rock shaft associated with the block and commanding determinate movements of the block, a lever mounted to the block for swinging movement and controlled by said slide, a rubbing-up wheel carried by said lever, and means for operating said rubbing-up wheel.

In testimony whereof I affix my signature.

CARL CHRISTIAN JULIUS WEBER.