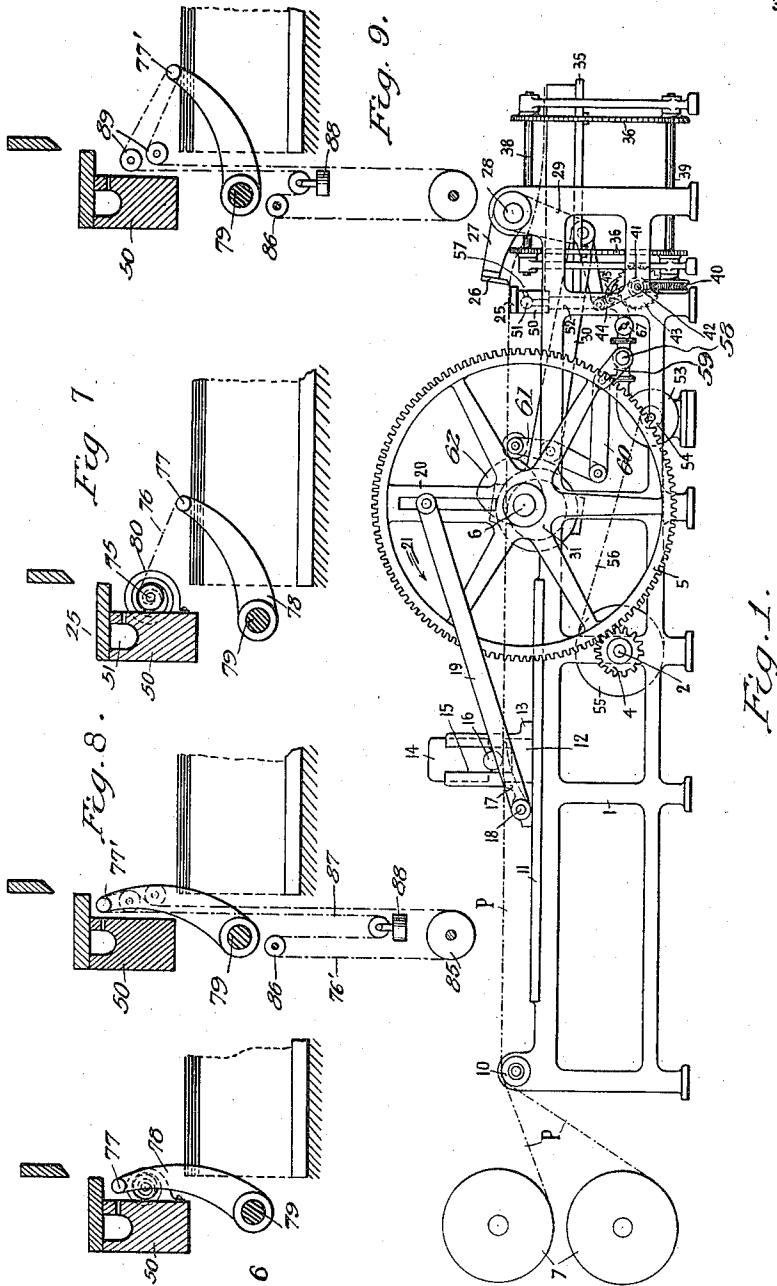


A. ROMMENY & G. KATHE.
 APPARATUS FOR CUTTING AND STACKING SHEETS OF PAPER OR THE LIKE.
 APPLICATION FILED DEC. 29, 1911.

1,152,551.

Patented Sept. 7, 1915.

3 SHEETS—SHEET 1.



Witnesses:
 M. Reimer.
 M. Hamilton.

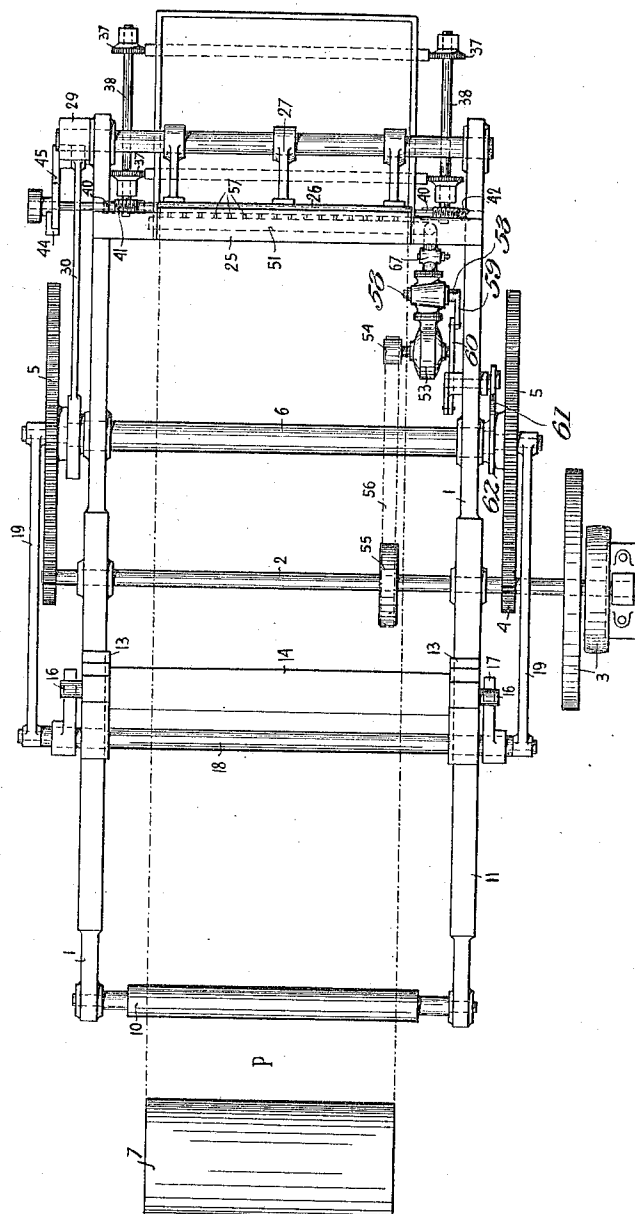
Inventors:
 Albert Rommeny
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 by their attorneys
 Hamilton Hamilton
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Fig. 2.



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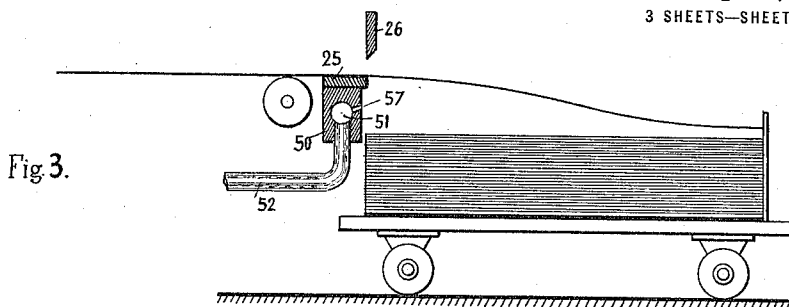
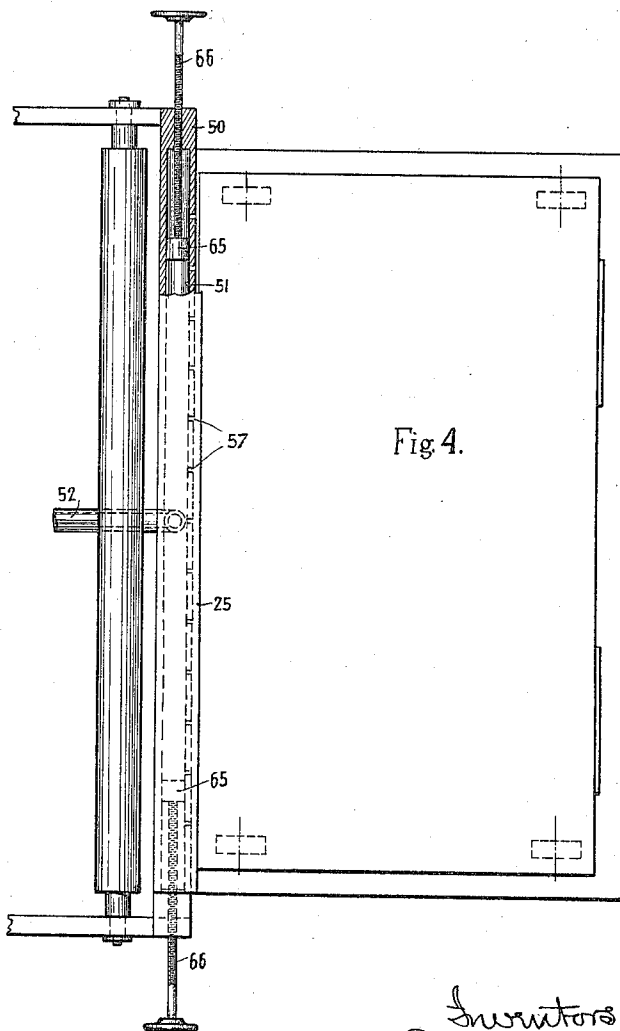
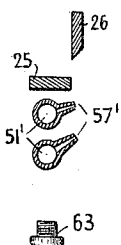


Fig 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALBERT ROMMENÉY AND GEORG KATHE, OF HEIDENAU, DRESDEN, GERMANY.

APPARATUS FOR CUTTING AND STACKING SHEETS OF PAPER OR THE LIKE.

1,152,551.

Specification of Letters Patent.

Patented Sept. 7, 1915.

Application filed December 29, 1911. Serial No. 663,518.

To all whom it may concern:

Be it known that we, ALBERT ROMMENÉY and GEORG KATHE, subjects of the Emperor of Germany, residents of Heidenau, Bez. Dresden, in the Kingdom of Saxony, Germany, have invented certain new and useful Improvements in Apparatus for Cutting and Stacking Sheets of Paper or the like, of which the following is a specification.

Our invention relates to improvements in apparatus for stacking sheets of paper or the like and more particularly relates to improvements in apparatus by means of which a sheet of paper or the like or the end of a continuous web is held in stretched position, while being fed between the cutter blades of a paper cutting machine, so that the cut sheet of paper is adapted to properly fall on a table on which the sheets are to be stacked, or on the pile of sheets which have before been stacked on the said table.

One of the objects of the improvements is to provide an apparatus of this class which is adapted to hold the sheet or web of paper or the like in a stretched position without being in bodily contact therewith. And with this object in view our invention consists in providing means in our improved apparatus whereby a difference of the pressure of the air above and below the sheet or web of paper is produced which is adapted to hold the said web or sheet afloat. This difference of the pressure may be produced by increasing the pressure below the sheet or web, or by reducing the same above the same. In the practical construction of our apparatus the said increase or reduction of the pressure of the air is obtained by producing a current of air below the sheet of paper, which current is so directed as to support the sheet or web of paper, or by producing a current of air above the web or sheet of paper or the like, in which case the said current must be so directed as to produce suction on the upper surface of the sheet. As will readily be understood, the means for producing a current of air below the web of paper are suitable for any strength of the web, because a sufficient pressure can easily be obtained, while the apparatus for producing a current above the web is suitable only in case of webs or sheets of paper of the finer grades.

In order that the invention may clearly be understood we shall describe the same with reference to a machine for cutting sheets of

paper from a continuous web and stacking the same on a table provided at the rear of the cutting apparatus. From the description given hereinafter other uses of the apparatus will readily suggest themselves to those skilled in the art, and we shall not specifically refer thereto. But we wish it to be understood, that our invention is not limited to the type of machine shown in the drawings. When applied to a machine for cutting sheets of paper or the like from a continuous web, or to machines of a different character various important advantages are obtained as compared to apparatus of this class such as are now in use.

The apparatus required for producing the current or currents of air are very simple in construction, so that mechanical devices can be dispensed with which make the machine cumbersome and are subject to wear. Further, mechanism for stacking the cut sheets is not necessary, so that the space which in other machines is required for this mechanism is spared, and the space required at the rear of the cutting apparatus corresponds to the size of the table or to the length of the sheets to be cut. In known apparatus the stacking mechanism must correspond to the largest size of the sheets which are ever cut on the machine whereby the table is made inaccessible when small sheets are cut, as is ordinarily the case. The operation of the new apparatus is by far more simple and reliable than the operation of known apparatus, and it requires less power.

If the paper handled by the apparatus is very heavy it may sometimes happen, that a very strong current is necessary to support the sheet, because the sheet is bulged and can not smoothly be stacked, if its rear end contacts with the stacked sheets at an obtuse or right angle. In order to reduce the strength of the current required in such cases we prefer to provide mechanical means which assist the current of air in supporting the rear end of the sheet and prevent the same from contacting with the pile of paper. It should be understood, that such supporting means are not similar in operation to mechanical stacking means such as are now in use, because they do not require the size corresponding to the largest sizes of the sheets cut on the machine, but are comparatively short and independent as to their dimension of the size of the sheet to be cut.

In order that our invention may more clearly be understood several examples embodying the same have been shown in the accompanying drawings, and in addition a machine for cutting sheets of paper from a continuous web in which the said examples may be embodied. In said drawings the same letters of reference have been used in all the views to indicate corresponding parts.

Figure 1, is a side view of a paper cutting machine with our improved apparatus for stacking the sheets of paper mounted thereon, Fig. 2, is a plan of Fig. 1, Fig. 3, is a diagrammatical side view partly in section of the stacking apparatus shown in Figs. 1 and 2, Fig. 4, is a plan of Fig. 3, Fig. 5, is a vertical cross-section of a modified form of the blowing device, Figs. 6 to 9, inclusive, are detail side views illustrating modified forms of the stacking apparatus.

Before describing our invention we shall at first describe a machine for cutting sheets of paper from a continuous web in which the stacking apparatus may be embodied. But we wish it to be understood, that our invention is not limited to the combination of the stacking apparatus with the cutting machine shown in the drawings, or with any type of a cutting machine, though the said combination is an important field of the use of our improved apparatus.

Referring more particularly to Figs. 1 and 2 of the drawings, the frame of the paper cutting machine consists of a pair of side frame members 1. In suitable bearings of the frame members a shaft 2 is mounted which at one of its ends has belt pulleys 3 secured thereto by means of which power is applied to the machine. To the shaft 2 a pinion 4 is keyed which is in mesh with a spur gear 5 mounted on a main shaft 6. From the shafts 2 and 6 motion is imparted to the various mechanisms of the cutting machine and of the stacking apparatus. At the left hand end of the machine frame two rolled webs 7 of paper are mounted on suitable brackets, (not shown), and from the said webs the paper P is fed over a guide roll 10 and to a feeding apparatus mounted for reciprocation on guide ways 11 formed on the upper side of the standards 1. As shown the said feeding apparatus consists of a lower bar 12 which is rigidly secured to a pair of slides 13 and a vertically movable upper bar 14 which is guided in vertical slots 15 of the slides 13. At both ends studs 16 project from the bar 14 which are adapted to be engaged by rockers 17 secured to a rock shaft 18 mounted on the slide 13. To the rock shaft arms 19 are secured which at their ends are jointed to arms 20 of the spur gears 5. Upon rotation of the said spur gears in the direction of the arrow 21 the rockers 17 are rocked downward, so that the upper

clamping bar 14 approaches the lower stationary bar 12, and the dimensions of the parts are such, that the clamping bars come into clamping engagement on the webs of paper in the dead point of the arm 20. Upon the further rotation of the spur gear the rockers 17 disengage the studs 16, so that the clamping bars remain in clamping engagement, while the slides 13 and the webs of paper are fed to the right and toward the cutting apparatus to be described hereafter. When the arm 20 arrives in its right hand dead point, the rockers engage the studs 16 and raise the upper clamping bar from the webs, so that the latter are at rest, while the clamping mechanism is being returned. The webs of paper are fed through a cutting device which consists of a stationary cutter blade 25 and a movable blade 26. As shown the movable blade is mounted on arms 27 secured to a common rock shaft 28 which at one end is provided with a crank arm 29. To the latter a lever 30 is jointed which is adapted to be reciprocated by an eccentric 31 secured to the main shaft 6. At the right of the cutting apparatus a table 35 is provided which is suspended by means of chains 36 trained on sprocket wheels 37. The latter are secured to upper shafts 38 and lower shafts 39. The shafts 39 carry worm gears 40 which are adapted to be slowly rotated by worms 41 provided on a common shaft 42. To the latter a ratchet wheel 43 is secured which is adapted to be slowly advanced by a pawl 43¹ which is mounted on a lever 44 connected with the crank arm 29 by a link 45. By this mechanism the table 35 is slowly lowered one step for each cutting operation, so that the surface of the stack of paper remains substantially at the same height.

Referring now to the parts of the machine to which our invention more particularly relates, reference will be had to Figs. 1 to 4 in which one embodiment of our invention is shown in a diagrammatical way and separate from the paper cutting machine. As shown, the lower cutting blade 25 is supported on a cross bar 50 having a longitudinal bore 51. The latter is connected through a pipe 52 with a suitable supply of compressed air which in the example shown consists of a blower 53 receiving power from the shaft 2 through a belt 56 trained on pulleys 54 and 55. At the side of the stack of paper the cross bar 50 is formed with a suitable number of nozzles or a longitudinal slot 57 through which jets of air are forced from the bore 51 and under the sheet of paper while being fed through the cutting apparatus. The direction of the jet may be made to vary with the weight of the paper cut, and so where different grades of paper are to be cut we prefer to make the said nozzles adjustable as to their inclination

relatively to the webs of paper. To avoid any waste of compressed air and to permit the cut sheets of paper to be deposited on the table 35, the supply of compressed air to the nozzles is stopped when the paper has arrived in cutting position, for which purpose a cock valve 58 is provided in the compressed air supply 52, and the said valve is controlled from the main shaft 6 through the intermediary of a crank arm 59 secured to the valve stem, a link 60, a rocker 61 mounted on a relatively stationary part of the machine, and a cam 62 secured to the shaft 6 and adapted to engage the rocker 61. By this mechanism jets of air are forced through the nozzles 57 while the webs of paper are being fed through the cutting device, and the supply of air is cut off at the end of the feeding stroke and when cutting takes place, so that the cut sheets of paper are properly deposited on the table 35.

Instead of providing the bore 51 for supplying the compressed air to the nozzles within the bar 50 a special tube 51¹ may be provided below the said bar, as is indicated in Fig. 5. As there shown the nozzles 57¹ are formed integral with the tube 51¹ but they may be constructed in the form of small studs screwed or otherwise secured to the said tube.

If desired a plurality of bores 51 or tubes 51¹ may be provided, as is shown in Fig. 5. Means may be provided to throw a suitable number of nozzles out of operation, so that the current of air adapts itself to the breadth or to the weight of the paper. To show what may be done we have shown in Fig. 5 one of a plurality of screw plugs 63 which is adapted to be screwed into one of the bores provided in case removable threaded nozzles are used. In the example shown in Fig. 4 a modification of the means for throwing some of the nozzles out of operation is shown, which modification is particularly adapted for controlling the nozzles located at the sides of the cutting apparatus. As shown in the said figure, plungers 65 are provided at the ends of the bar 50 which plungers can be adjusted within the bore 51 so as to close the desired number of the nozzles. The plunger rods 66 are screw-threaded, so that by rotating the same the plungers are more or less advanced within the bore 51. Furthermore means are provided whereby the pressure of the air is regulated, which means consist in the example shown in Figs. 1 and 2 of a throttle valve 67. We wish it to be understood, that the means shown in the drawings may be substituted by other devices, and that under circumstances either all of the said means or a part thereof may entirely be omitted.

In the modification shown in Figs. 6 and 7 curved supporting arms 70 are shown which are secured to a rock shaft 71 located

below the lower cutter bar 50² and driven from the main shaft 6 in any suitable way. The arms are passed from behind through suitable slots 72 of the cutter bar, and when projected through the said slots, they provide a guide for the front edge of the web of paper. As shown the air supply nozzles 57² and their pipe 51² are located above the web of paper and at the right of the upper cutter blade 26, and the air is forced through the said nozzles while the web is being advanced between the cutter blades. Simultaneously the arms 70 are gradually advanced, and when the web is being cut the said arms are suddenly retracted. A suitable mechanism for operating the said arms will readily suggest itself to those skilled in the art. As an example of what may be done, the operating mechanism may be driven from a cam mounted on the main shaft 6 and formed with suitable cam surfaces from which a gradual advancing movement is imparted to the arms while the web is being fed and a sudden retracting movement when the web has come to rest. As distinguished from the example shown in Figs. 1 to 5, in which the jets of air act by pressure on the lower surface of the web, the nozzles shown in Figs. 6 and 7 act by suction. The jets of air are interrupted the moment the web is being cut.

In Fig. 8 we have shown an example in which the arms 70¹ for providing an additional support for the web are formed on the pipe 51³ from which the jets of air are discharged, and the said pipe has a rocking support on the shaft 71¹.

In the example shown in Fig. 7 a rotary shaft 75 is located at the right of the lower cutter bar, and on the said shaft a tape 76 is rolled which with its free end is attached to a bar 77. The latter is mounted on arms 78 which are secured to a rock shaft 79 operated in any suitable way, for example by means of a crank arm and a cam, from the main shaft 6. A coiled spring 80 secured with one end to the shaft 75 and with the opposite end to a relatively stationary part of the machine frame tends to rewind the tape 76 and thereby to retract the bar 77. The tape 76 provides in its unrolled position for an additional support for the web advanced through the cutter bars.

In the example illustrated in Fig. 8 an endless tape 76¹ is provided in lieu of the tape 76 shown in Fig. 7, and the said tape is trained on rollers 85, 86 and 89, and it forms a loop 87 in which a weight 88 is supported. The tape 76¹ is also laid around the bar 77¹. When the bar 77¹ is moved to the right it carries along the tape 76¹ and raises the weight 88, and when it is returned, the weight retracts the tape. Preferably the bar 77¹ is constructed in the form of a roller to reduce friction.

We claim herein as our invention:

1. A machine for cutting a web transversely into sheets and stacking the sheets, comprising a channeled transverse cutter-supporting beam the channel in which is
5 formed with jet-outlets on the side thereof toward which the severed sheets are delivered; a cutting member mounted upon said beam above said jet-outlets; a second cutting
10 member which is arranged to cooperate with the first-named cutting member to sever the web transversely of its length; and means for forcing compressed air into the channel in said beam and thence through said jet-
15 outlets.
2. A machine for cutting a web transversely into sheets and stacking the sheets, comprising a channeled transverse cutter-supporting beam the channel in which is
20 formed with jet-outlets; a cutting member mounted upon said beam above said jet-outlets; a second cutting member which is arranged to cooperate with the first named cutting member to sever the web transversely
25 of its length; means for forcing compressed

air into the channel in said beam and thence through said jet-outlets; and reciprocating guide-members which are arranged to move away from and then back toward said beam and to support the edge of the sheet contiguous thereto. 30

3. A machine for cutting a web transversely into sheets and stacking the sheets, comprising a channeled transverse cutter-supporting beam the channel in which is
35 formed with jet-outlets; a cutting member mounted upon said beam above said jet-outlets; a second cutting member which is arranged to cooperate with the first-named cutting member to sever the web transversely of
40 its length; and means for forcing compressed air into the channel in said beam and thence through said jet-outlets.

In testimony whereof we affix our signatures in presence of two witnesses.

ALBERT ROMMENEY.
G. KATHE.

Witnesses:

PAUL ARRAS,
CLARE SIMON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."