Dec. 2, 1924. 1,517,739

J. LOTZ

PAPER RULING MACHINE

Filed Oct. 23, 1923 2 Sheets-Sheet 1

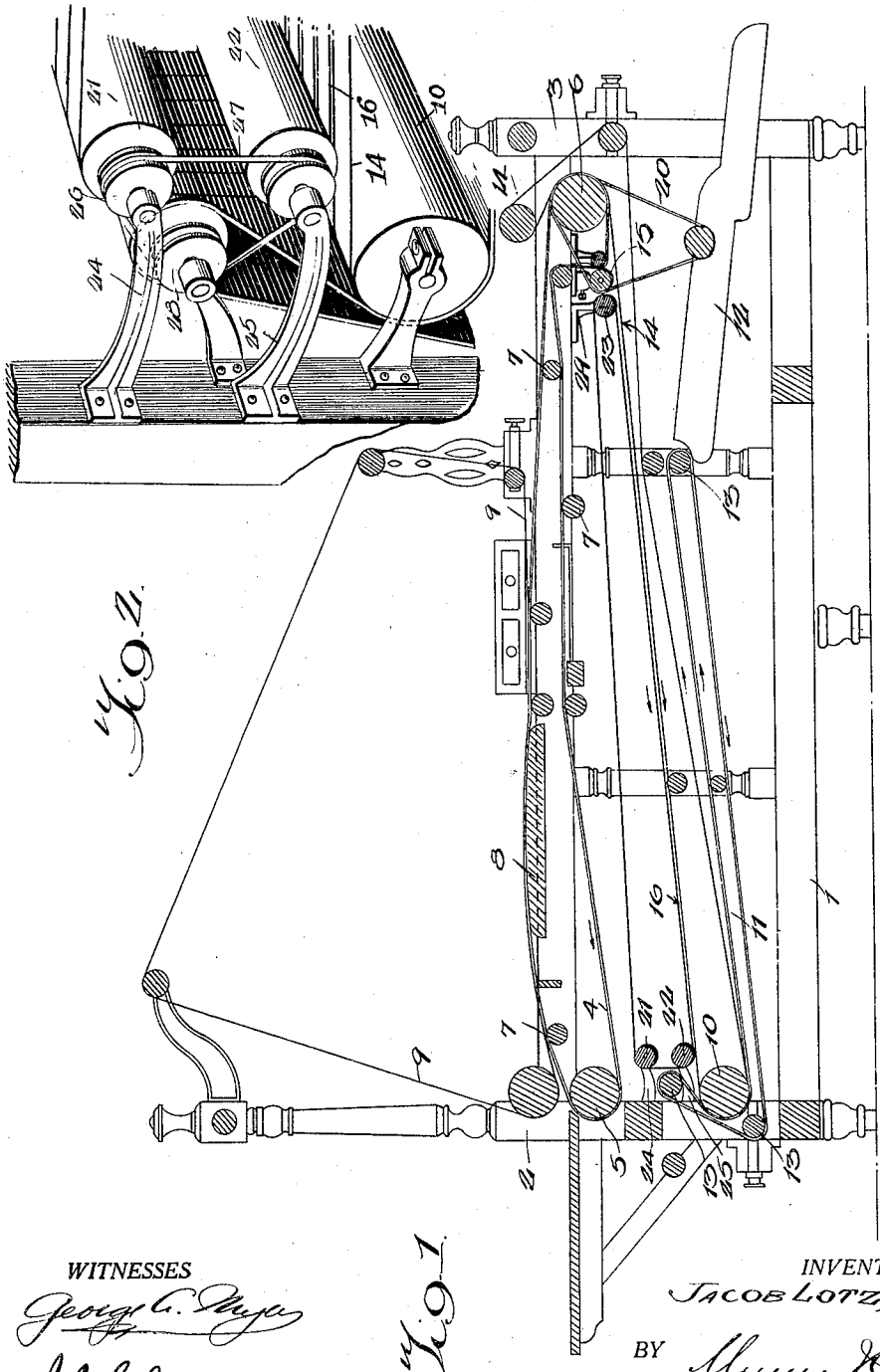


Fig. 2.

Fig. 1.

WITNESSES

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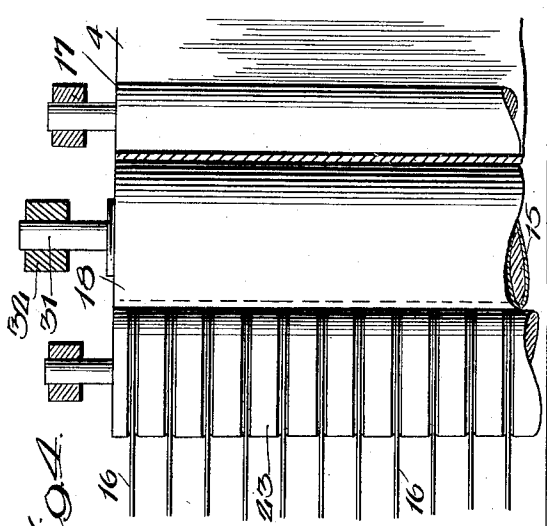


Fig. 4.

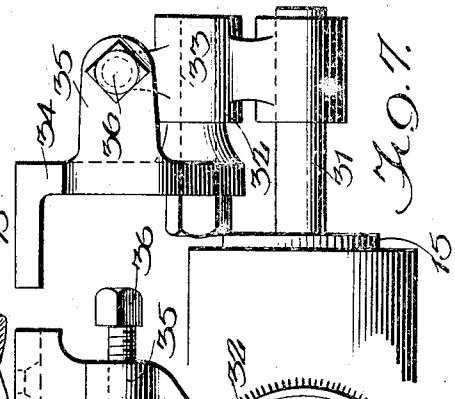


Fig. 7.

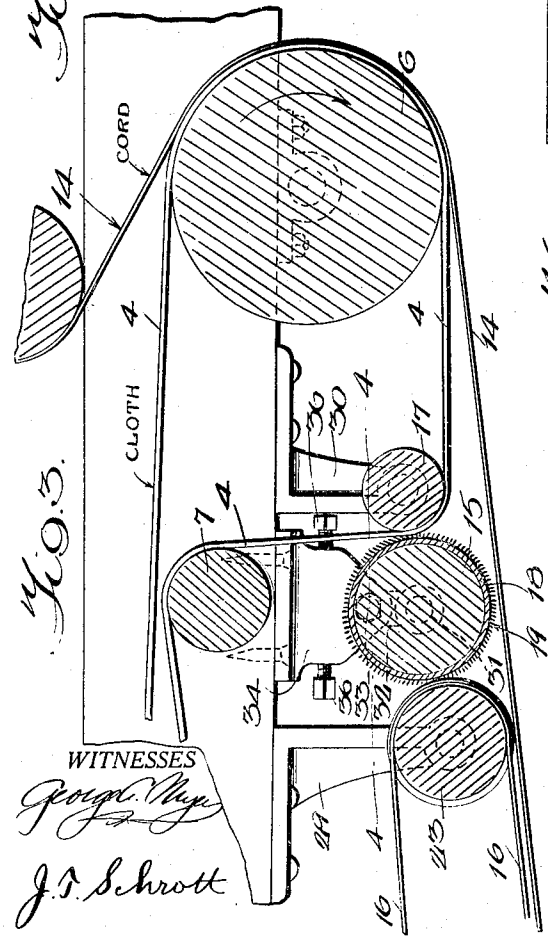


Fig. 3.

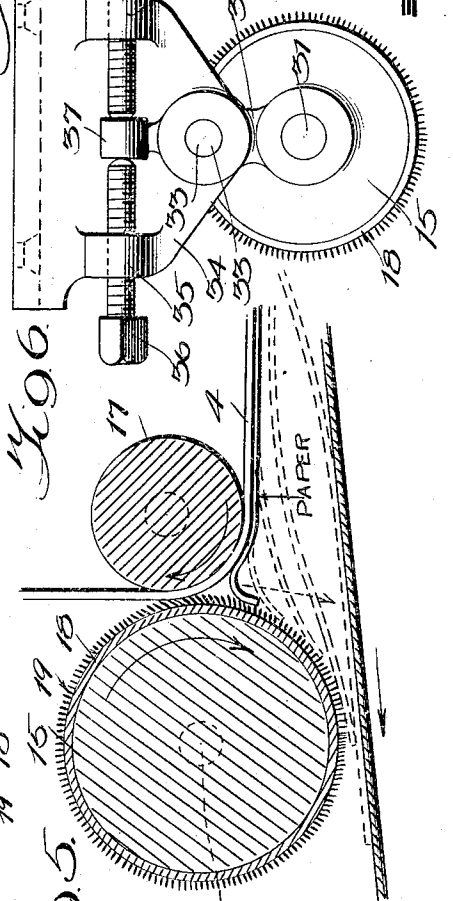


Fig. 6.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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PAPER-RULING MACHINE.

Application filed October 23, 1923. Serial No. 670,307.

To all whom it may concern:

Be it known that I, JACOB LOTZ, a citizen of the United States, and a resident of Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Paper-Ruling Machines, of which the following is a specification.

My invention relates to improvements in paper ruling machines and its consists of the constructions, combinations and arrangements herein described and claimed.

An object of the invention is to provide means for preventing ruled paper from adhering to and following the return side of the upper cloth after having left the end roller of a ruling machine.

A further object of the invention is to provide an arrangement of middle cords adapted to cooperate with the means aforesaid but provided for the specific purpose of holding the ruled paper down on the under cords so that the paper traveling on said cords may neither shift its position nor that the leading edges may curl up.

Another object of the invention is to provide the combination of middle cords, constituting a part of the invention, with the under cords of a ruling machine so as not only to hold the ruled paper down on the under cords but permit the ruler to see through between the sheets as they pass.

A further object of the invention is to provide a brush roller for the purpose of detaching the ruled sheets from the return side of the upper cloth, said brush roller having the secondary purpose of dislodging any adhering dirt or dust on said cloth and thus tend to keep it clean.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings, in which:—

Fig. 1 is a longitudinal section of a ruling machine illustrating the application of the brush roller and the middle cords,

Fig. 2 is a detail perspective view showing how the front rollers of the middle cords are driven,

Fig. 3 is a detail sectional view showing the mounting of the brush roller and of the grooved roller more clearly,

Fig. 4 is a detail horizontal section taken substantially on the line 4—4 of Fig. 3,

Fig. 5 is a detail view illustrating the detaching action of the brush roller and showing how the paper is caused to lay down on the under cords,

Fig. 6 is an end elevation of one of the adjustable hangers in which the brush roller is mounted, and

Fig. 7 is a side elevation of the parts shown in Fig. 6.

The ruling machine to which the invention is applied in the drawings may be regarded as of a conventional design. It is not necessary to describe all of the ruling machine in detail, only a comparatively small part being involved so far as the invention is concerned. The ruling machine comprises a frame 1 which is supported by uprights 2 and 3 at the front and rear respectively.

The so-called upper cloth 4 runs over front and rear rollers 5 and 6 which are considerably larger than the numerous inter mediate rollers 7 over which the cloth is guided in its travels. The upper cloth also passes over the bed board 8. The upper cords 9 are arranged in such a manner as to hold the paper which is to be ruled down on the upper cloth 4 as it passes across the bed board 8.

In addition to the rollers 5 and 6 the ruling machine is also provided with a lower front roller 10 over which the lower cloth 11 passes in such a manner as to convey the ruled paper to the lay boy 12. A suitable number of idlers 13 is provided in order to properly support the lower cloth 11. Working in conjunction with both the rear or end roller 6 and the lower front roller 10 are the under cords 14 which are trained over the end roller 6 in such a manner as to hold the ruled paper against the upper cloth 4 as it passes around the end roller from the top to the under side. The reader will understand that the under cords 14 are necessary to keep the ruled paper against the cloth, otherwise the paper would drop off as soon as it rounded the end roller.

The invention consists of the brush roller 15, which acts in combination with the upper cloth 4 and the middle cords 16 which act in combination with the under cords 14. In order that the brush roller 15 may function as desired, the return side of the upper cloth 4 is directed over a turning roller 17 by means of which the direction of the return side of the upper cloth is changed abruptly, as clearly shown both in Figs. 1 and 3.

The brush roller 15 may be composed of a body of wood or any other suitable material, faced with cloth 18 which has a nap 19 suitable to perform a brushing function against the upwardly moving part of the returning upper cloth 4. The brush roller 15 turns in the same direction as the end roller 6, this turning being accomplished by the lay boy belt 20. In view of the fact that the roller 17 is so disposed in respect to the roller 15 that the upper cloth 4 is caused to turn abruptly upward, the clockwise motion of the brush roller becomes contrary to the direction of movement of the aforesaid part of the upper cloth.

The nap 19 of the cloth therefore brushes downwardly upon the return side of the upper cloth and exercises two important functions; one, any sheets of paper which tend to adhere to the return side of the upper cloth by static electricity, for example, are brushed down until they properly fall upon the under cords 14; two, any dust, dirt or ink adhering to the upper cloth is brushed away so that the upper cloth remains in a clean condition.

The other element of the invention, described as being the middle cord 16, begins its function immediately that the brush roller 15 ceases its functions. The ruled paper having been brushed down from the return side of the upper cloth 4 runs along the upper strand of the under cords 14 toward the lower front roller 10. The wind resistance has a tendency to cause the leading edges of the ruled paper to rise, sometimes sufficiently to misplace the paper on the under cords and cause improper feeding both around the roller 10 and into the lay boy 12. Again, the paper sometimes has a tendency to coil up completely. The object of the middle cords 16 is to keep the ruled paper flat on the under cords 14 so that neither of the foregoing contingencies may arise.

An arrangement of rollers 21, 22 and 23 (Fig. 1) furnishes the support for the middle cords 16. The latter roller is grooved as shown in Fig. 4. The rollers 21 and 22 are smooth. Each is mounted in brackets 24 and 25 which are fastened to the front uprights 2 (Fig. 2). These rollers also carry pulleys 26 which are driven by means of a belt 27 from a pulley 28 on the adjacent idler 13. The grooved roller 23 is supported in hangers 29 which are fastened beneath the longitudinal rails of the frame. The turning roller 17 is mounted in corresponding hangers 30.

The mounting of the brush roller 15 is different from the hangers described in that provision for the adjustment of the brush rollers is made therein. The stub shafts 31 of the brush roller are journalled in hangers 32 which are pivoted at 33 on pendent brackets 34 in such a manner that the brush roller may be made to bear against the upper cloth 4 with more or less pressure as conditions may require.

Each pendent bracket 34 has a pair of lugs 35 in which set screws 36 are mounted. These are intended to be screwed in or out in respect to the head 37 of the hanger 32 (Fig. 6) so that the hanger may be rocked in one or the other direction.

There is another advantage which accompanies the use of the middle cords 16 in addition to that of holding the paper down on the under cords 14. The ruler in attending the machine, regards it an advantage to be able to see through the various moving cords and follow the ruled paper on its way to the lay boy 12. The reason for this statement is that attempts have been made to train the return side of the upper cloth 4 over the under cords 14 in such a manner as to hold the ruled paper down on the under cords en route to the lower front roller 10. This of course obscures the ruled paper. By using the open middle cords 16, the ruler may follow the course of the paper and therefore take full advantage of the satisfaction which this particular provision affords.

The operation may be briefly reviewed to advantage. The ruled paper approaches the end roller 6, being conveyed in that direction by the upper cloth 4. The under cords 14 are necessary to hold the ruled paper against the cloth as it passes around the roller 6. The upper strands of the cords 14 form the conveyor by which the ruled paper is carried toward the lower front roller 10 after it has passed the roller 6.

Two elements of the invention, namely, the brush roller 15 and the middle cords 16, cooperate in insuring that the ruled paper shall traverse the upper strand of the cords 14 in a proper manner. The brush roller 15 performs its functions by brushing against the return side of the upper cloth 4, and for this purpose, the return side of the upper cloth is made to make an abrupt turn at the turning roller 17 (Fig. 3). The action is well illustrated in Fig. 5.

Assume a sheet of ruled paper to adhere to the return side of the cloth 4 by means, for example, of the attraction of static electricity. The turning roller 17 moves in a clockwise direction and so does the brush roller 15. The side by side disposition of these rollers causes one to brush down while the other moves up, the action of the nap 19 on the cloth facing 18 being to loosen the free edge of the paper, gradually sweeping it down, as shown by the various dotted line positions in Fig. 5 until the paper lies flat on the under cords 14.

No sooner is the paper properly laid

upon the cords 14 than the middle cords 16 come into action to keep the paper flat on said cords. The middle cords 16 prevent the leading edges of the paper from flying up, as for example, by the resistance of the air, until the lower front roller 10 is reached, whereupon the ruled paper passes onto the lower cloth 11 and finally into the lay boy 12.

It may become necessary to adjust the brush roller 15 in respect to the turning roller 17. This is accomplished by the set screws 36 (Fig. 6) which, by proper manipulation, serve to turn the pivoted hangers 32 so as to move the brush roller 15 into the desired position in respect to the roller 17. It is to be added that besides serving to brush the paper from the return side of the upper cloth 4, the brush roller has the added function of keeping the cloth 4 clean. The nap 19 brushes out any ink sediment and removes any dust that may have settled on the upper cloth.

While the construction and arrangement of the improved ruling machine as herein described and claimed, is that of a generally preferred form, obviously modifications and changes may be made without departing from the spirit of the invention or the scope of the claims.

I claim:—

1. In combination with the upper cloth and under cords of a ruling machine between which ruled paper is adapted to pass, means over which the return side of the upper cloth is trained causing a sudden change in the direction of movement, means including a nappy cloth-faced roller operating at said place, said nap brushing upon the return side of the cloth to loosen any paper tending to adhere thereto and causing it to fall on the under cords, but avoiding raising any nap on the upper cloth by virtue of being soft, and another set of cords having a portion arranged parallel to and traveling with said under cords to keep said paper in place thereon.

2. In combination with the upper cloth and under cords of a ruling machine between which ruled paper is adapted to pass, a turning roller over which the return side of said cloth is trained to abruptly change the direction of movement, a brush roller adjoining said turning roller having a facing of nappy cloth adapted to loosen sheets of paper tending to adhere to the upper cloth and cause them to fall upon the under cords, means causing the brush roller to revolve in a direction opposite to that of the movement of the return side of said upper cloth, means disposed over said under cords keeping the paper flat thereon as it travels with the under cords, and means permitting adjustments of the brush roller in respect to the turning roller so that the nap of the cloth facing may bear on the upper cloth with accordingly various pressures.

3. In combination with the front upright and upper longitudinal members of a ruling machine frame, the end roller and lower front roller, and the under cords trained to run thereover; a pair of rollers disposed adjacent to said lower front roller, brackets by which said rollers are supported on the front uprights, a grooved roller disposed adjacent to said end roller, hangers by which said roller is suspended from the longitudinal member, middle cords trained over said pair of rollers and said grooved roller so that the lower portion runs close to and parallel with the upper portion of said under cords to hold down sheets of paper carried by the latter, and means for driving both rollers of said pair so that said lower portion moves with the under cords at the same speed.

4. A ruling machine having a moving upper cloth, a turning roller by which the return side of said cloth is caused to make an abrupt change in direction, a revoluble brush roller situated next to the turning roller and a facing of material upon the brush roller having a soft nap bearing against the upper cloth at said abrupt turn to continuously and lightly brush said upper cloth while moving.

5. A ruling machine having a moving upper cloth, a turning roller by which the return side of said cloth is caused to make an abrupt change in direction, a revoluble brush roller situated next to the turning roller at said abrupt turn in said cloth, said roller having a facing of nappy material bearing against and continuously brushing the upper cloth while moving, means causing the brush roller to turn in a direction opposite to that of the movement of said cloth, and swinging hangers in which the brush roller is journalled so that the brush roller may move toward and away from the turning roller.

6. A ruling machine having a moving upper cloth, a turning roller by which the return side of said cloth is caused to make an abrupt change in direction, a revoluble brush roller situated next to the turning roller at said abrupt turn in said cloth, said roller having a facing of nappy material bearing against and continuously brushing the upper cloth, means causing the brush roller to turn in a direction opposite to that of the movement of said cloth, swinging hangers in which the brush roller is journalled so that the brush roller may move toward and away from the turning roller, and means including set screws bearing against a portion of each hanger on opposite sides for fixing said swinging hangers in various adjusted positions.

7. A paper ruling machine having a

travelling conveyor cloth for carrying sheets, a revoluble sheet stripper-roller, and a cloth facing upon said roller having a nap contacting the conveyor cloth, said nap being soft thereby preventing disturbance of the conveyor cloth nap.

8. A paper ruling machine having a travelling conveyor cloth for carrying printed sheets, a revoluble sheet stripper-roller, and a facing of cloth upon said roller having a nap brushing against the conveyor cloth to continuously remove any adhering dust, ink, etc. and thereby keep the conveyor cloth in a clean condition.

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