

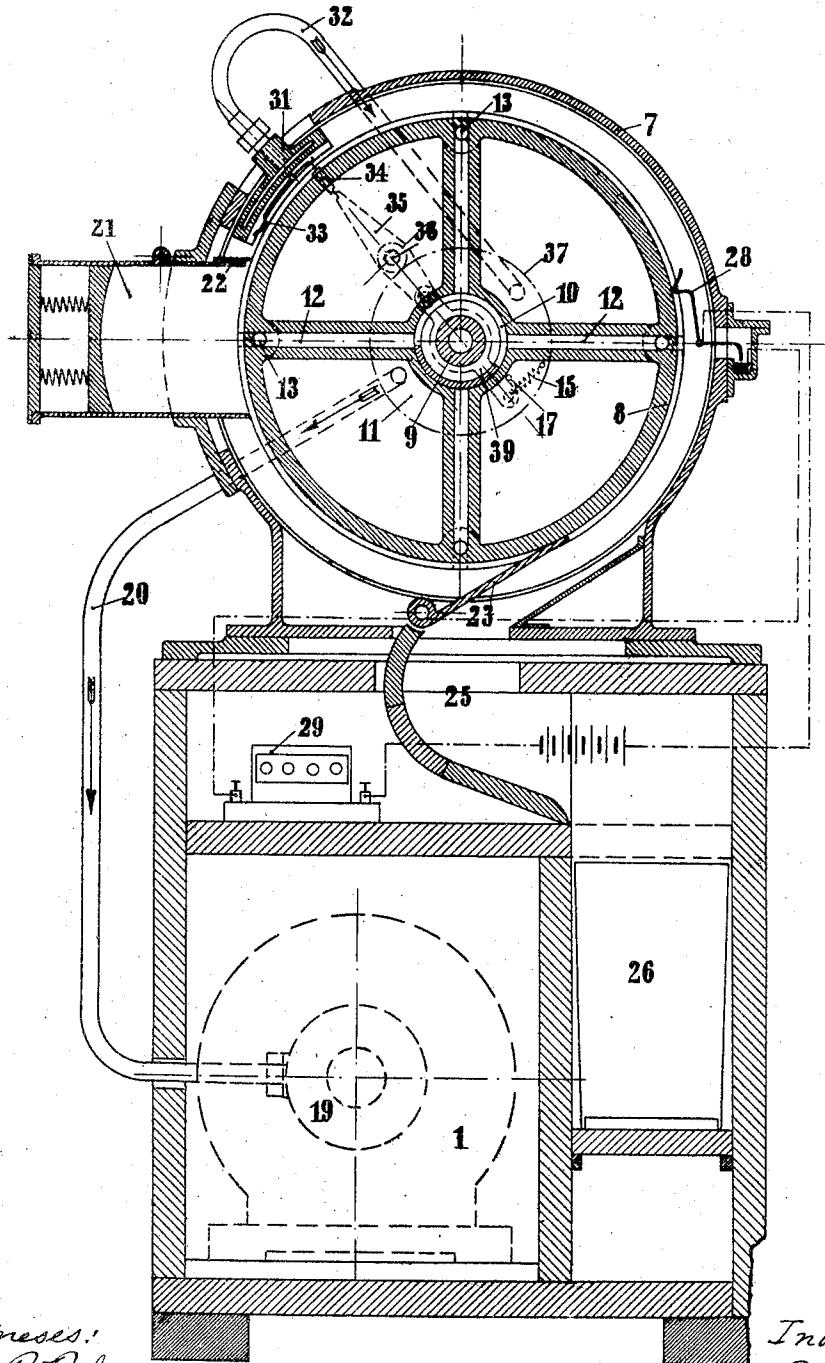
G. SCHLESINGER.
SHEET HANDLING MECHANISM.
APPLICATION FILED AUG. 2, 1910.

1,040,025.

Patented Oct. 1, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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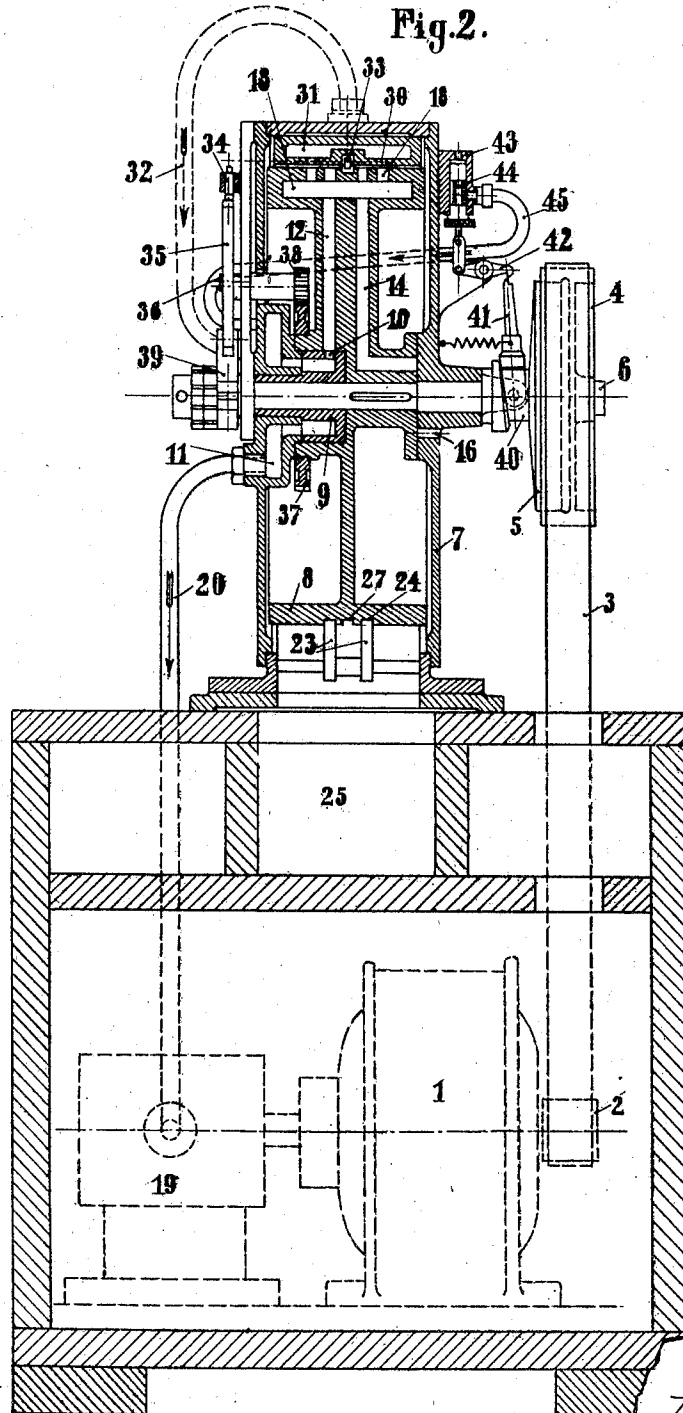
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORG SCHLESINGER, OF BERLIN-WILMERSDORF, GERMANY.

SHEET-HANDLING MECHANISM.

1,040,025.

Specification of Letters Patent.

Patented Oct. 1, 1912.

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To all whom it may concern:

Be it known that I, GEORG SCHLESINGER, doctor engineer, a citizen of the German Empire, residing at Berlin-Wilmersdorf, in the German Empire, have invented certain new and useful Improvements in Sheet-Handling Mechanism, of which the following is a specification.

This invention relates to an apparatus for taking off, counting or arranging sheets of paper, tickets, cards and the like, working with air pressure.

The chief peculiarity of the apparatus is that a "surface" which is caused to pass in front of the sheets, tickets, cards or the like is furnished with holes through which air can be drawn, during a certain part of the movement of the "surface", by means of an air suction apparatus. This is effected by bringing the holes, at the place where the "surface" is to seize a sheet or the like, into communication with the air suction apparatus by means of a slide-valve and then bringing them into the delivery position where they are disconnected from the air suction apparatus, by means of a second valve arrangement, and are connected with the outer air.

The example of the invention hereinafter described and illustrated in the accompanying sheets of drawings is a machine for counting tickets, cards and the like, more particularly for statistical purposes. In this example of the machine the operating "surface" is a cylinder and has no to and fro motion but only a rotatory one.

In the drawings Figure 1 is a cross section and Fig. 2 a longitudinal section of the machine.

The electric-motor 1 drives the shaft 6 of the machine by means of the belt-pulley 2, the belt 3, the loose pulley 4 and the friction cone 5. The shaft 6 is journaled in the casing 7, and has keyed on it a drum 8. The boss of this drum surrounds a circular slide-valve 9, which is journaled in the frame and itself forms the bearing for the end of the shaft 6 remote from the pulley 4. The slide-valve 9 remains stationary during regular working; it is hollow and has in its periphery a slot 10 more than 180° long. The hollow of the slide-valve is connected with a hollow space 11 of the casing.

The drum 8 has a number of spokes, in the drawing four are shown, in each of which is arranged a system of channels.

From the slot 10 of the slide-valve 9 a channel 12 leads in each spoke to a channel 13 arranged in the rim of the drum. From the channel 13 an angular shaped channel 14 leads to the opposite face of the boss of the drum 8. This face lies against a surface of the casing 7, the circular arc shaped slot 16 of which connects the channel 14 with the outer atmosphere. From each channel 13 holes 18 lead to the peripheral surface of the drum 8. At the side of the electric-motor 1 opposite to the belt pulley 2 the armature shaft is connected with an air pump 19 which draws air from the hollow space 11 in the casing 7 through the pipe 20.

The sheets or tickets to be taken off, arranged or counted are placed in the holder 21. A brush 22 placed at the edge of the holder 21 prevents more than one sheet or ticket being taken by the drum. Opposite to the holder 21 are fixed strippers 23 of any suitable known kind, the points of which lie in grooves 24 in the periphery of the drum. Connected with the strippers is the delivery chute 25 through which the sheet or ticket falls into a basket 26, for example. In a groove 27 in the periphery of the drum rests the counter 28 of known construction, which, on the passage past it of a sheet or ticket, is raised, and by means of an electric contact moves the counting gear 29. The counting gear may, however, be moved mechanically by the counter 28 or in any other suitable way.

The action of the machine is as follows: By the air-pump 19 the air pressure is reduced in those channels 13 which are brought into communication with the hollow space 11 by the slot 10 of the slide-valve 9. This happens for each channel 13 while it passes the holder 21. Through the outer air pressure, and by means of an elastic pressing apparatus, the contents of the holder 21 are pressed against the drum 8, and the outermost sheet or ticket is taken away while the remainder are held back by the brush 22. The ticket taken away moves with the drum 8 past the counter 28, which it raises once, to the strippers 23, by which it is removed from the drum. When the ticket reaches the strippers, the mouth of the corresponding channel 14 also reaches the slot 16 of the casing 7, while the mouth of the channel 12 comes out of communication with the slot 10 of the slide-valve 9.

The outer air then enters through the slot 16 and the channel 14 into the channel 13, so that the difference of pressure above and below the ticket is removed. The ticket is then no longer held by the drum and is pushed down in a tangential direction. It then slides through the curved delivery chute 25 and falls into the basket 26.

Notwithstanding the brush 22, it may happen that two tickets instead of one are taken by the drum. Then comes into action an auxiliary apparatus which holds back the surplus ticket and attaches it to the next following openings 18. Above the drum 8 is arranged, near the periphery of the drum, a hollow body 31 provided with suction openings 30, the inner space of which hollow body is connected with the hollow space 11 by a pipe 32. To the hollow body 31 is pivoted a lever 33, with which is connected a slide 34 outside the casing 7. The slide 34 can be moved into the path of a lever 35, which is pivoted to the casing 7 and moved to and fro by an eccentric 36. The eccentric makes, at each revolution of the drum, as many oscillations as there are present channels 13. For this purpose a toothed wheel 37 is keyed on the boss of the drum 8 and gears with a toothed wheel 38 on the shaft of the eccentric 36. The lever 35 engages at its lower end with a ring 39 fixed to the slide-valve 9.

So long as the upper end of the lever 35 is free it oscillates to and fro while the lower end remains stationary. But when the slide 34 comes into the path of the lever 35 the upper end of the latter is held fast, the lower end then moves the slide-valve 9 forward. The spring 15 on the ring 39 moves the lever 35 back into its normal position which is fixed by the stop 17.

This apparatus acts as follows: When two tickets are taken by the drum the upper one remains attached to the hollow body 31, while the lower one goes on with the drum. This is effected by the pipe 32 and the suction openings 30 being so proportioned that the suction action of the openings 30 is less than that of the openings 18, and the upper ticket is left hanging to the hollow body 31; the lever 33 is thereby raised somewhat higher than it otherwise would be. The slide 34 is consequently thrust farther out, holds fast the lever 35 and causes a movement of the slide-valve 9 in the direction of rotation of the drum. The next passing channel 13 is therefore exhausted of air somewhat later than usual, and just after it has passed the holder 21. It therefore takes no ticket from the latter but seizes the one hanging to the hollow body 31 and takes it with it. The lever 33 is thereby released and the slide-valve 9 is returned into its original position by the spring 15. In case of the holder 21 becoming empty the machine stops auto-

matically. For this purpose the boss of the friction-cone 5 is provided with an inclined groove 40 in which engages the lower end of a lever 41 fulcrumed on the casing 7. The lever 41 therefore makes a stroke at each revolution of the friction-cone 5. Over the upper end of the lever 41 is pivoted a lever 42, one end of which can enter the path of the lever 41, while the other end hangs to a piston which rests on an adjustable spring 44 in the cylinder 43. The space over the piston is in communication with the atmosphere, the space below the piston communicates with the suction space 11 by a pipe 45.

So long as a vacuum prevails in the suction space 11 the piston is pressed down against the action of the spring 44 by the pressure of the atmosphere acting upon it. But immediately the holder 21 becomes empty the atmosphere can enter through the holes 18 and the vacuum in the suction space 11 and below the piston of the cylinder 43 is destroyed. The spring 44 then raises the piston and with it the lever 42, so that the end of the latter comes into the path of the lever 41 which is thereby held and draws the friction-cone 5 out of the pulley 4, thus stopping the machine. Instead of arranging the channels 13 in a rotatable drum they may be arranged in a slide to which a to and fro movement is imparted. This arrangement is specially suitable for apparatus used for the taking off of sheets of paper.

The invention is not limited to the example described, but can be modified in various ways to suit the special purpose for which it is to be employed.

I claim:

1. A sheet handling mechanism comprising a casing, a rotary drum in said casing and having a series of suction chambers or slots on its periphery and two sets of channels communicating with the suction chambers, a pump having communication with one set of said channels and exhausting the air from said chambers or slots, a valve co-operating with and opening and closing said channels by the movement of the rotary drum, and controlling the communication of the pump with one set of said chambers or slots; while the other set of channels is connected or disconnected with the outside air, a stationary hollow body provided with suction openings adjacent to the periphery of the rotary drum and in communication with the suction pump, a slide valve controlling the communication of the pump with said hollow body, and means for actuating said slide valve when more than one ticket is held by the suction chambers.

2. A sheet handling mechanism comprising a casing, a rotary drum in said casing and having a series of suction chambers or slots on its periphery, and two sets of chan-

nels communicating with the suction chambers, a pump having communication with one set of said channels and exhausting the air from said chambers or slots, a valve coöperating with and opening or closing said channels by the movement of the rotary drum, and controlling the communication of the pump with one set of said chambers or slots, while the other set of channels is connected or disconnected with the outside air, a stationary hollow body provided with suction openings and a groove adjacent to the periphery of the rotary drum and in communication with the suction pump, a lever in said groove pivoted to the hollow body and resting on the drum, a sliding bar connected to said lever, an oscillating lever controlling the position of the valve and adapted to be engaged by the lever in said groove when more than one ticket is engaged or carried by said chambers.

3. A sheet handling mechanism comprising a casing, a rotary drum in said casing

and having a series of suction chambers or slots on its periphery, and two sets of radial channels communicating with the suction chambers, a pump having communication with one set of said channels, and exhausting the air from said chambers or slots, a valve coöperating with and opening and closing said chambers by the movement of the rotary drum, and controlling the communication of the pump with said chambers or slots, a cylinder, one end of which communicates with the outside air and the other end with the suction end of the pump, a piston in said cylinder, and means connected with said piston for disconnecting the motive power from said drum when the feeding of sheets to said drum terminates.

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

GEORG SCHLESINGER.

Witnesses:

HANS STOLLER,
RUDOLF HARM.

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