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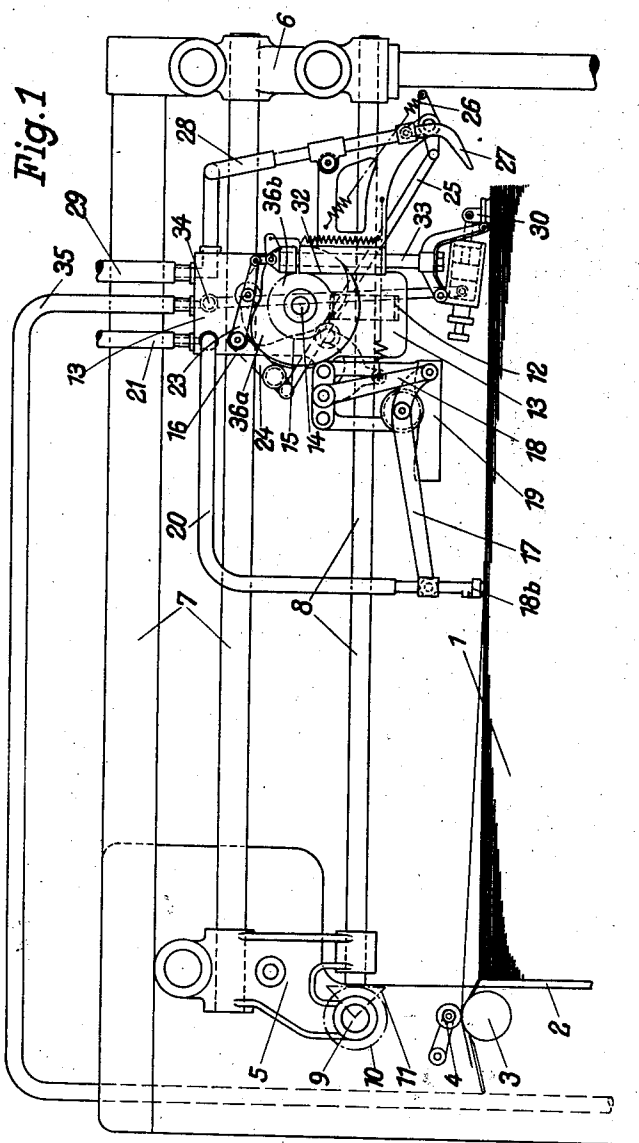
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2,000,261

SHEET SEPARATING AND CONVEYING DEVICE

Filed July 30, 1934

2 Sheets-Sheet 1



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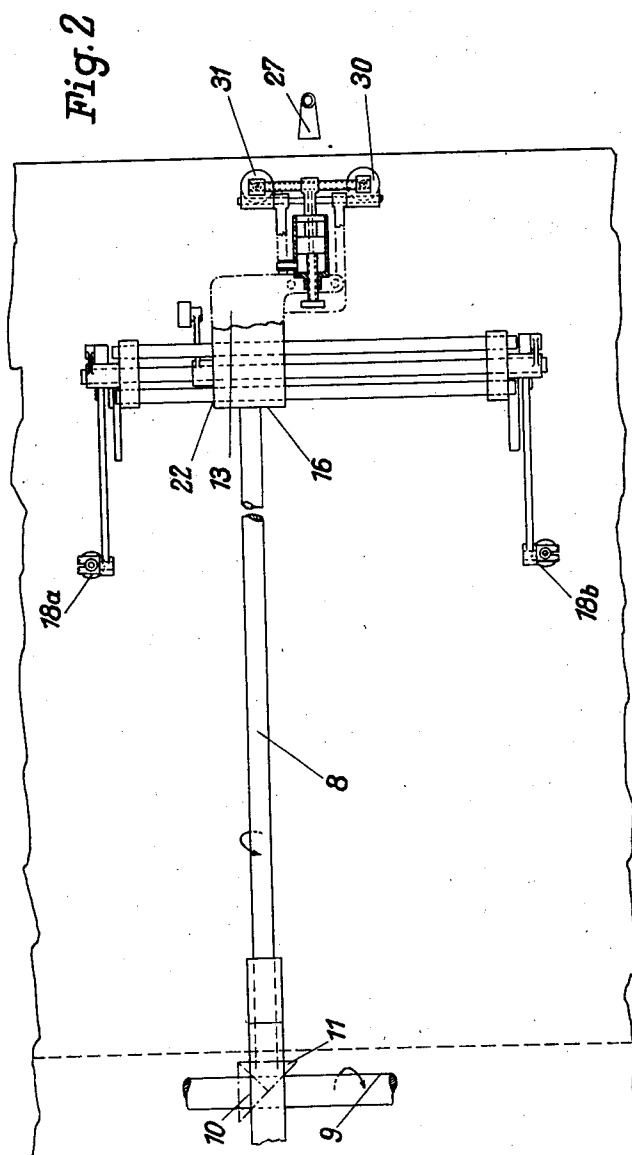
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SHEET SEPARATING AND CONVEYING DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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SHEET SEPARATING AND CONVEYING
DEVICE

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4 Claims. (Cl. 271-26)

This invention relates to a sheet separating and conveying device provided with suction members adjustable in feeding direction and separating the rear edge of the top sheet of the pile from the latter, and with additional suction members adjustable and oscillatable in conveying direction between the separating means and the front edge of the pile for engaging the sheet freed from the pile from above and displacing it in conveying direction.

The invention refers particularly to an arrangement of the additional suction members and their drive, which simplifies and facilitates adjustability as required in handling sheets of different length and width.

In the known sheet separating and feeding devices of this type the additional suction members are adjustable also but separated from the separating device engaging the rear edge of the sheet, so that separate adjustments are necessary. Adjustment of the feeder to a new sheet size is thus rendered bothersome and involves the risk that the adjustment made to insure good cooperation between the sheet separating and feeding devices will not be maintained. Furthermore, the separate arrangement of the sheet separating device and the additional suction members requires special means for transmitting drive from the stationary driving parts to the adjustable driven parts.

According to the invention, the changing of the feeder to different sheet sizes is simplified and facilitated by arranging the additional suction members and the separating means with their driving parts on a joint pedestal body adjustable in feeding direction in such a way that they remain in unchanged driving connection with the stationary driving parts when the pedestal body is adjusted in feeding direction. Double adjustments are thus dispensed with and no attention need be paid to reestablishing the old relation between the additional suction members and the separating means. It is known to arrange a separating device engaging the rear edge of the sheet together with its driving means on a pedestal body adjustable in feeding direction so as to keep the driving connection unaltered during adjustment, and the invention consists in developing this idea and arranging in a feeder of the type described the additional suction members with their driving means as well as the sheet separating device with its driving means on a joint adjustable pedestal body.

As the additional suction members are preferably arranged in pairs to avoid distortion of

the sheets during feeding, the invention provides also for the adjustment of the additional suction members transversely to the feeding direction in view of the changing width of the sheets by arranging in the pedestal body a special control shaft for the drive of the additional suction members and separating means transversely to feeding direction, which is driven from the driving shaft extending in feeding direction by means of a worm gear whose driving wheel is non-rotatably yet longitudinally displaceably disposed on the driving shaft extending in feeding direction and driven by the pedestal body in any direction during adjustment.

One form of the invention is illustrated in the accompanying drawings, in which all non-essential parts have been omitted and in which Figure 1 is a front view of the sheet separating and feeding device with a joint carrying and pedestal body according to the invention; and Fig. 2, a plan of the device showing the position of the suction members acting in the front part and on the rear edge of the sheet and the air blasts.

Referring to the drawings, the sheet pile 1 rests in known manner with its front surface against the vertical guides 2 of the pile table, and its top plane, i. e., the sheet to be fed, is kept at constant height by known means according to the removal of sheets. In front of the guide rods 2 the constantly rotating guide roller 3 is disposed which cooperates with the up and down moving pressure rolls 4 and conveys the sheets delivered to it to the feeding station.

In the top of the frame of the device two bearing brackets 5 and 6 are secured which are firmly connected by a carrying shaft 7 and in the lower journals of which the driving shaft 8 is rotatably positioned. By means of the single revolution shaft 9 disposed in the frame rotary driving motion is transmitted by the two bevel gears 10 and 11 to the driving shaft 8 at same speed. The driving shaft 8 is splined over its full length to permit the helical gear 12 displaceably attached thereto and engaging the groove by means of a wedge plug to vary its axial position as required. While in any position on the shaft 8 the gear 12 will transmit without fail the rotary motion to the second helical gear meshing with it.

On the carrying shaft 7 the carrying and pedestal body 13 is displaceably arranged so as to permit convenient adjustment in sheet

feeding direction according to the position of the rear edge of the sheet. In the center of the body 13 which is hollow the cam shaft 14 is rotatably located. The helical gear 15 pinned to the shaft 14 is in mesh with the lower helical gear 12 displaceably disposed on the shaft 8 and transmits the rotary motion at the same speed to the cam shaft 14.

To the wall 16 of the body 13, which lies in front relative to the feeding direction of the sheet, the moving levers 17 and 18 for the suction members 18a and 18b acting near the center of the sheet to be fed, the lifting member 19 and the suction pipe connection 20, 21 are articulated. The two front suction members 18a, 18b with their operating levers 17, 18 are adjustable relative to one another in the direction of the width of the sheet on two guide rods secured in the body 13, but their relative distance need be changed only if particularly thin papers sag on the two side edges or in the center of the sheet. For this purpose only regulation is provided for the two front suction members 18a, 18b, which require no adjustment transversely to the feeding direction in case of standard papers and sufficient paper stiffness.

The pipings 20, 21 may be of telescope type with cup packing or, as shown, consist of rubber hose.

The left-hand side wall 22 of the body 13 is constructed as journal for the driving elements 23, 24 and 25, 26 of the air blast 27 whose air piping 28 is in direct communication with the blast air piping 29 inserted in the surface of the body 13.

The suction members 30, 31 operating on the rear edge of the pile and drawing up and tilting the topmost sheet are stationarily connected with the body 13 by means of their vertically displaceable guide rod 32 disposed in the guide 32. The suction piping 34 of these suction members is in direct communication with the suction air supply piping 35 screwed into the surface of the body 13.

Inside the hollow body 13 and on the cam shaft 14 the cams 36a, 36b are pinned side by side, which, by their more or less eccentric shape, bring about the lifting motions of the parts separating the sheet from its support and conveying it further at the proper time.

This new and peculiar combination of all the operating elements into a single carrying and pedestal body represents the embodiment of the invention.

The adjustment of the sheet separating and conveying device when passing from one sheet size to another requires only two manipulations, viz., to adjust the body 13 according to the new position of the rear edge of the sheet and, in case of flappy paper possessing little stiffness, to regulate the distance between the two front suction members.

The necessary adjustment during a change of size has thus been reduced to a minimum with respect to time and skill, so that the device according to the invention facilitates the handling and increases the output of sheet separating and conveying means.

I claim:—

1. A sheet separating and conveying device, having, in combination, a suction member adjustable in feeding direction for separating the rear of the topmost sheet from the pile, additional suction members between the sheet separating means and the front end of the pile, said additional members being adjustable in feeding direction and oscillatable for engaging the sheet from above and displacing it in feeding direction, driving means for said additional suction members, a hollow pedestal body adjustable in feeding direction and carrying said additional suction members and their driving parts, sheet separating means and driving means therefor, said sheet separating and driving means being arranged in said hollow body and remaining in unchanged and uninterrupted driving connection with the stationary driving means.

2. In a device according to claim 1 a cam shaft arranged transversely to feeding direction in the pedestal body, a driving shaft extending in feeding direction, and a worm gear for transmitting rotation to the driving shaft, the driving wheel of said worm gear being non-rotatably yet longitudinally displaceably arranged on the driving shaft and cooperating in the adjustment of the pedestal body.

3. In a device according to claim 1 transverse guide rods on the pedestal body, transversely adjustable operating and lifting members for the additional suction members arranged with their suction members on said guide rods and a cam for jointly actuating the additional suction members.

4. In a device according to claim 1 a lifting member on the pedestal body, operating levers and a lifting cam for controlling the additional suction members.

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