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PAPER FEEDING MACHINE.

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NO MODEL.

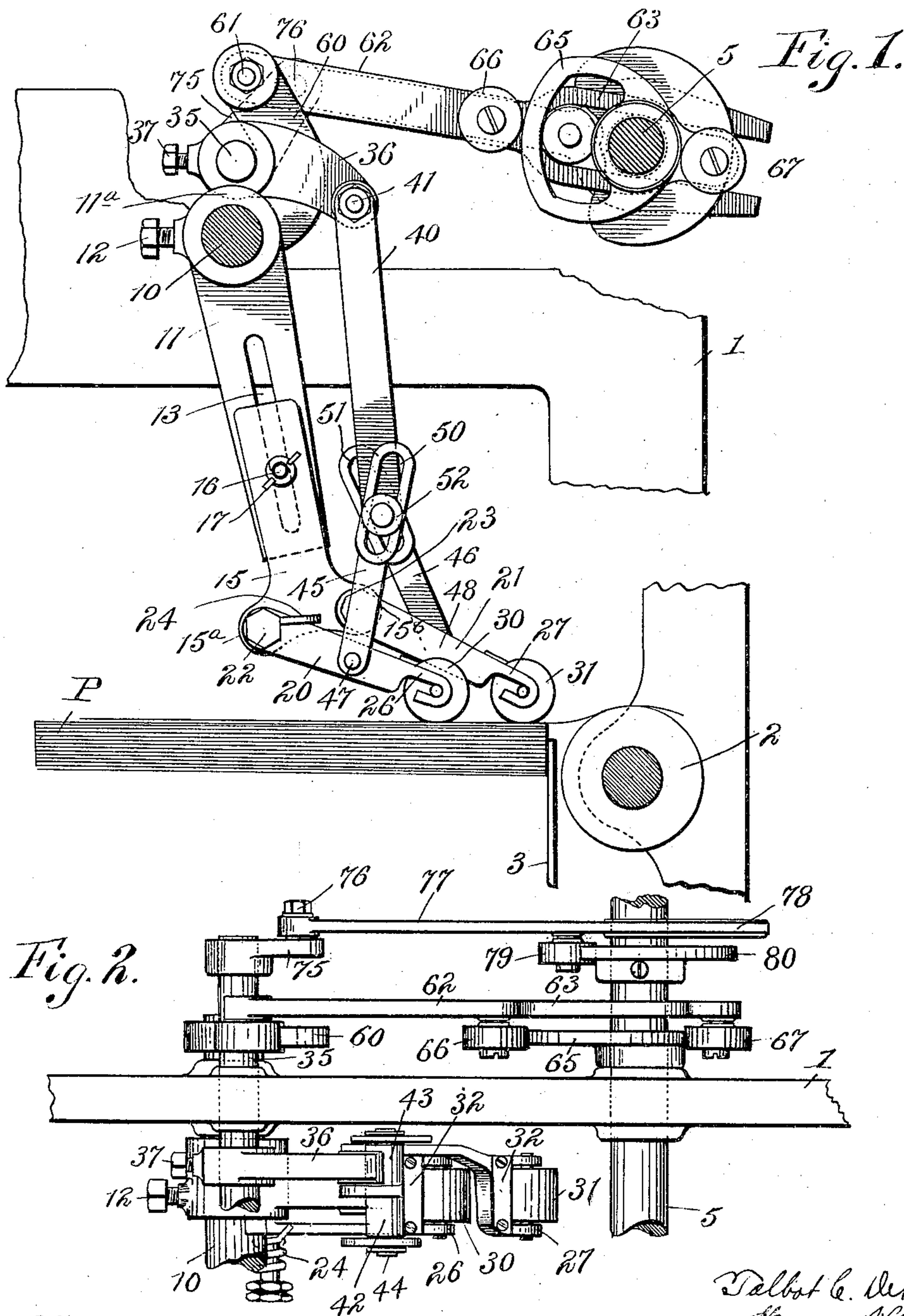


Fig. 2.

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PAPER-FEEDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 768,979, dated August 30, 1904.

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To all whom it may concern:

Be it known that we, TALBOT C. DEXTER and HENRY HALLSTREAM, both citizens of the United States, and residents of Pearl River, in the county of Rockland and State of New York, have invented certain new and useful Improvements in Paper-Feeding Machines, of which the following is a specification.

The present invention relates to improvements in the feeding-off devices of automatic paper-feeding machines in which a pile of sheets is supported upon an automatically-elevated table and the successive sheets are acted upon first by sheet-buckling devices or equivalent means for preliminarily separating the successive sheets at one edge and afterward by suitable feeding-off devices which take the partially-separated sheet and feed it forward from the machine to a printing-press, folder, ruling-machine, or other machine designed to operate upon sheets of paper.

The present invention has for its object to improve the construction and operation of the feeding-off devices. In these large automatic paper-feeding machines it is customary to provide two sets of feeding-off devices arranged about equal distances from the side edges of the pile of sheets and adapted to operate in parallel vertical planes above the pile of sheets to engage the top sheet of the pile in two parallel lines and move it forwardly out of the machine, with the front-edge of the sheet extending squarely across the machine. In operating upon piles of large sheets of paper the feeding-off devices must be arranged to automatically adjust themselves to the inequalities in the top surface of the pile, since the top surface of such piles almost invariably have elevations and valleys in them over which the feeding-off devices must pass without losing their grip upon the sheet which is being fed forward.

The main feature of novelty in our present invention consists in providing a sheet-moving mechanism with two independently-mounted sheet-moving instruments having independent "lost-motion" connections with

suitable elevating means which raise them away from the pile at the completion of their forward stroke and hold them in elevated position while they are moved rearwardly preparatory for a new stroke.

Our improved sheet-moving mechanism comprises a suitable carrier movable forwardly and backwardly over the pile and consisting, preferably, of a depending rock-arm, two sheet-moving instruments provided in their forward free ends with frictional sheet-engaging blocks or pads and independently journaled at their rear ends upon the movable carrier and provided with independent springs for normally depressing them into effective engagement with the top sheet of the pile, elevating means consisting, preferably, of a rock-arm supporting a vertically-extending rod or bar, and independent links pivotally connected with the independent feeding instruments and having pin-and-slot connections with said depending rod or bar, whereby the independent instruments are adapted to automatically accommodate themselves to any unevenness in the top of the pile of sheets and at the same time are provided with effective means for raising the instruments away from the pile when they complete their forward stroke and are moved rearwardly preparatory for another stroke.

In order that our invention may be fully understood, we will first describe the same with reference to the accompanying drawings, and afterward point out the novelty with more particularity in the annexed claims.

In said drawings, Figure 1 is a detail sectional elevation of part of a paper-feeding machine having our improved feeding-off devices applied thereto. Fig. 2 is a plan view of the same.

1 is part of the framework of any suitable paper-feeding machine, and 2 is one of a series of underfeed-rollers suitably journaled in the machine-frame in the path of the sheets and adapted to cooperate with the usual drop-feed rollers, (which are not shown.)

P indicates a pile of sheets which is sup-

ported on an automatically-elevated table or platform, (which is not shown.)

3 indicates one of a series of vertical plates or bars arranged at the front edge of a pile of sheets for maintaining it in alinement.

5 is the cam-shaft of a paper-feeding machine from which all of the operative parts of the machine are driven.

10 is a rock-shaft suitably journaled in the upper part of the feeding-machine frame above the pile of sheets and extending transversely of the machine from side to side. This rock-shaft 10 supports and actuates the feeding-off devices, which will presently be described, it being understood that in a machine of the type referred to two sets of feeding-off devices are arranged to operate in parallel vertical planes above the pile of sheets.

11 is a rock-arm keyed to the rock-shaft 10 by means of a set-screw 12 and projecting downwardly therefrom toward the pile of sheets. This rock-arm 11 is preferably formed with a longitudinal slot 13.

15 is an adjustable extension of rock-arm 11, said extension being formed with enlargements 15^a and 15^b for the purpose presently to be explained. The extension 15 is adapted to fit upon one face of the slotted end of rock-arm 11 and is confined thereon by means of a headed bolt 16, passing through the slot 13 and through a perforation in the extension 15, and a nut 17, threaded upon the bolt 16 and securely clamping the extension 15 upon the rock-arm 11 in the desired adjusted position. This extension 15 may be adjusted toward or away from the pile of sheets for lengthening or shortening the rock-arm 11.

20 and 21 are independent sheet-moving fingers journaled, respectively, upon bolts 22 and 23, mounted in the enlargements 15^a and 15^b of the rock-arm extension 15. These feed-fingers 20 and 21 are freely journaled upon said bolts, and each one is provided with an independent spring 24, mounted upon the bolt 22 or 23 and engaging the finger for giving it a normal downward tendency to move into engagement with the top of the pile of sheets. The forward end of each feed-finger 20 and 21 is of yoke shape, as shown at 26 and 27, and mounted in the downwardly-presented hook ends of the yoke-arms of said fingers are the soft-rubber friction-rolls 30 and 31, which are free to rotate in their bearings except when engaged by the knife-edges 32, when the fingers are moved forwardly in a manner well understood in the art.

35 is a second rock-shaft suitably journaled in the machine-frame and extending from side to side of the machine above and parallel with the main rock-shaft 10. This second rock-shaft 35 carries a forwardly-projecting rock-arm 36, which is adjustably keyed to it by means of the set-screw 37. The hub of the main rock-arm 11 is cut out, as indicated

in dotted lines at 11^a in Fig. 1, to receive the lower portion of the hub of rock-arm 36, the walls of said cut-out portion insuring the proper relative position of the rock-arm and affording a convenient means for adjusting them in unison transversely of the machine, the set-screws 12 and 37 being of course loosened before such adjustment can be accomplished.

40 is a rod or bar journaled at 41 in the outer end of rock-arm 36 and extending downwardly therefrom toward the independent feed-fingers 20 and 21. Said rod or bar 40 is formed at its lower end with the lateral extensions or lugs 42 and 43, in the outer ends of which are mounted the pins or screws 44.

45 and 46 are independent links pivoted, respectively, to the feed-fingers 20 and 21 at 47 and 48. These links 45 and 46 are formed at their upper ends with the elongated slots 50 and 51, with which engage, respectively, the pins 44, mounted in the lugs 42 and 43, suitable washers, such as 52, being confined by pins 44 to afford proper lateral bearing for the slotted upper ends of said links.

The rod or bar 40, links 45 and 46, and the pin-and-slot connection between said rod or bar and said links afford the independent lost-motion connection between the elevating means and the independent sheet-feeding fingers for the purpose of allowing each feed-finger entire freedom in automatically adjusting itself to the inequalities in the pile of sheets. For rocking the main rock-arm 11 forwardly and backwardly over the pile for imparting a feeding movement to the independent feed-fingers we provide the rock-shaft 10 with an upwardly-extending rock-arm 60, having pivotally connected to its upper end at 61 a link or pitman 62, which is formed with a slotted or yoked forward end 63, which embraces and guides upon the cam-shaft 5.

65 is the main cam, keyed to the shaft 5 and operating upon the antifriction-rollers 66 and 67, which are freely journaled upon the link 62 at opposite ends of the guide-yoke 63, so as to give the rock-arm 11 a positive movement forward and back over the pile.

The feed-finger-elevating rock-shaft 35 is intermittently rocked for raising and lowering the feed-fingers at the proper moment by means of an upwardly-projecting rock-arm 75, journaled at 76 to a link 77, formed with a bifurcated or yoked end 78, which embraces and guides upon the cam-shaft 5 and carries an antifriction-roller 79, which operates upon the periphery of a semicircular cam 80, which is keyed to the cam-shaft 5.

The operation of our sheet-feeding devices will be clear with but few words of explanation. Two sets of the feeding devices just described are employed in each machine, the operating means for the rock-shafts 10 and 35

not being duplicated. When the feeding devices start to operate, the frictional feed blocks or pads 30 and 31 are in contact with the top of the pile of sheets and the rock-arms 11 are in their extreme rear positions. The rock-arms move forwardly, causing the friction-pads of the independent feed-fingers to frictionally engage the top sheets of the pile and move it forward from the pile, each finger being free to independently adjust itself to any inequalities in the top of the pile. When the feed devices reach the limit of their forward movement, in which position they are shown in Fig. 1 of the drawings, the rock-shaft 35 is moved to elevate rod or bar 40, which raises the feed-fingers 20 and 21 through the pin-and-slot connection with the links 45 and 46. The rock-arms 11 are then moved rearward again while held in elevated position preparatory for a new stroke, when the feed-fingers are again lowered into engagement with the top of the pile and the operation is repeated.

Having thus described our invention, the following is what we claim as new therein and desire to secure by Letters Patent—

1. The combination with a support for a pile of sheets, of a movable carrier, two sheet-moving instruments independently mounted upon said carrier in operative relation to the pile of sheets, and elevating means having an independent "lost-motion" connection with each of said instruments, whereby said instruments will be free to independently follow any unevenness in the top of the pile of sheets, substantially as set forth.

2. The combination with a support for a pile of sheets, of a movable carrier having means for moving it to and fro over the pile, two sheet-moving instruments independently pivoted upon said carrier, and elevating means having an independent pin-and-slot connection with each of said instruments, substantially as and for the purpose set forth.

3. The combination with a support for a pile of sheets, of a rock-arm mounted above the said pile-support, means for rocking said rock-arm to and fro over the pile, two sheet-moving instruments independently pivoted upon said rock-arm and supported thereby in operative relation to the top of the pile of sheets, and elevating means having an independent "lost-motion" connection with each of said instruments, substantially as and for the purpose set forth.

4. The combination with a support for a pile of sheets, of a longitudinally-extensible sectional rock-arm mounted above the said pile-support, means for rocking said rock-arm to and fro over the pile, two sheet-moving instruments independently pivoted upon said rock-arm and supported thereby in operative relation to the top of the pile of sheets, and elevating means having an independent "lost-

motion" connection with each of said instruments, substantially as and for the purpose set forth.

5. The combination in a feeding-machine, of a suitable frame, a support for a pile of sheets, a rock-shaft journaled in said frame above the said pile-support, a rock-arm keyed to and depending from said rock-shaft, said rock-arm being formed of two adjustably-connected sections by which the rock-arm may be lengthened or shortened, means for rocking said rock-shaft to cause the rock-arm to move to and fro over the pile, two sheet-moving instruments independently pivoted upon said rock-arm and supported thereby in operative relation to the top of the pile of sheets, and elevating means having an independent "lost-motion" connection with each of said instruments, substantially as and for the purpose set forth.

6. The combination with a support for a pile of sheets, of a rock-shaft journaled above said pile-support, suitable cam mechanism for rocking said shaft, a rock-arm depending from said rock-shaft, two sheet-moving instruments independently pivoted upon the lower end of said rock-arm, and elevating means independently connected with each of said instruments, substantially as set forth.

7. The combination with a support for a pile of sheets, of a movable carrier mounted above said pile-support, two sheet-moving instruments independently pivoted upon said carrier and supported thereby in operative relation to the top of the pile of sheets, an independent spring engaging each sheet-moving instrument for holding it into effective engagement with the top of the pile of sheets, and elevating means having independent "lost-motion" connections with said sheet-moving instruments, substantially as set forth.

8. The combination with a support for a pile of sheets, of a movable carrier supported above the pile-support, two sheet-moving instruments independently pivoted upon said carrier and supported thereby in operative relation to the top of the pile of sheets, a rock-shaft having means for operating it, a rock-arm projecting from said rock-shaft, a rod or bar pivoted upon said rock-arm and depending therefrom, an independent link pivotally connected to each sheet-moving instrument, and pin-and-slot connections between said independent links and said depending rod or bar, substantially as set forth.

9. The combination with a support for a pile of sheets, of a rock-shaft journaled above said support, a rock-arm depending from said rock-shaft, two sheet-moving fingers independently pivoted upon said depending rock-arm and provided with frictional sheet-engaging pads, a second rock-shaft journaled above the pile-support and provided with a second rock-arm,

a rod or bar pivotally mounted upon said second rock-arm and depending therefrom, independent links pivotally connected with said sheet-moving fingers and each link formed
5 with a longitudinally-slotted upper end, oppositely-projecting pins mounted upon the lower end of said rod or bar and engaging the slotted ends of said independent links, and suit-

able cam mechanism for operating said two rock-shafts, substantially as set forth.

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