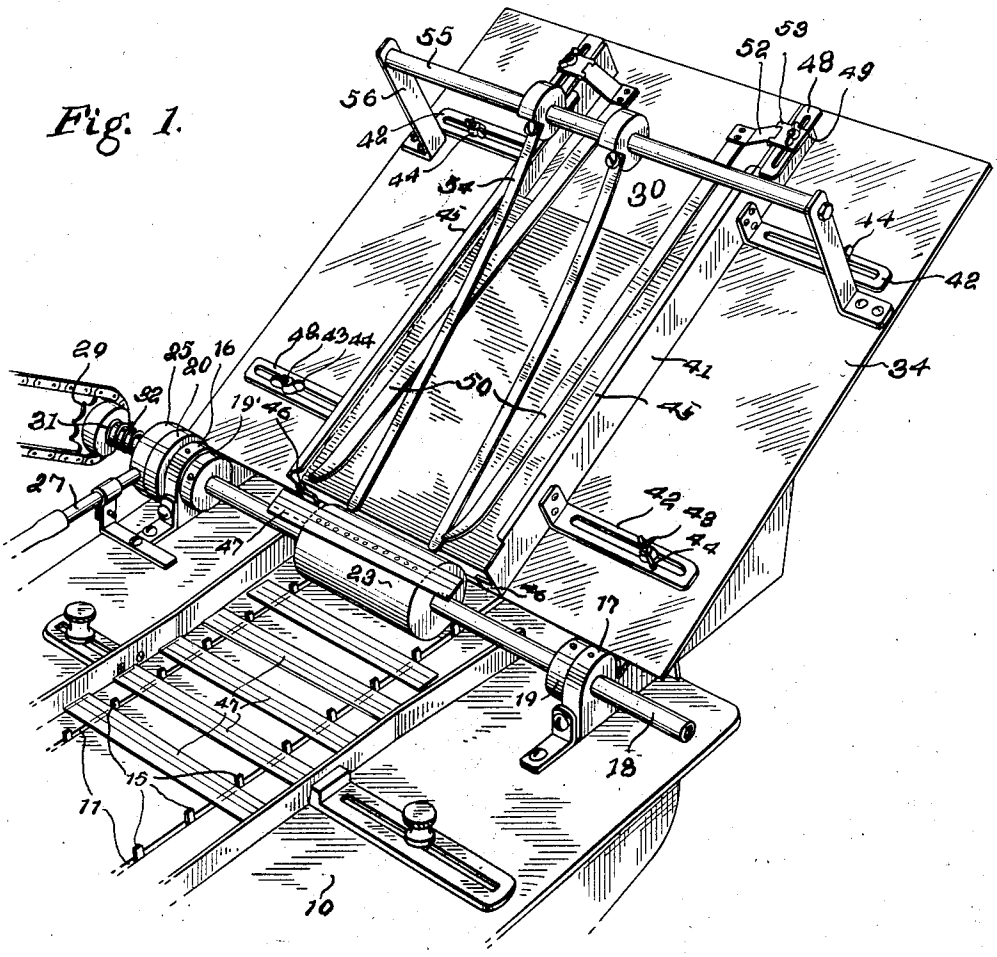
March 5, 1935. C. N. CIOLINO 1,993,240

PNEUMATIC FEEDER

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Fig. 1.



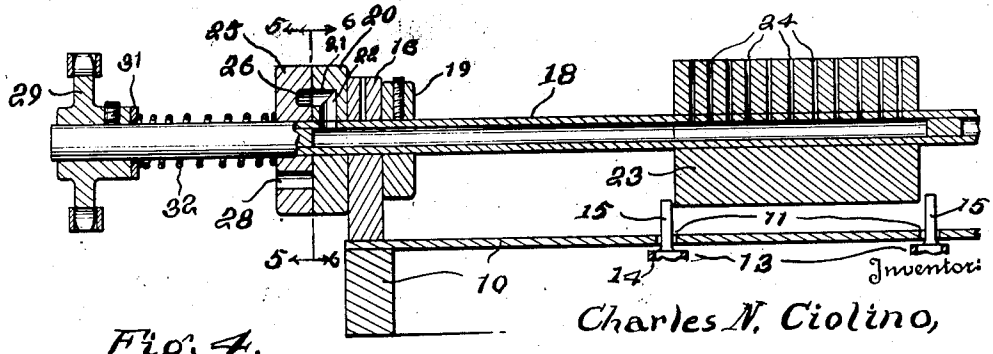


Fig. 4.

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Fig. 2.

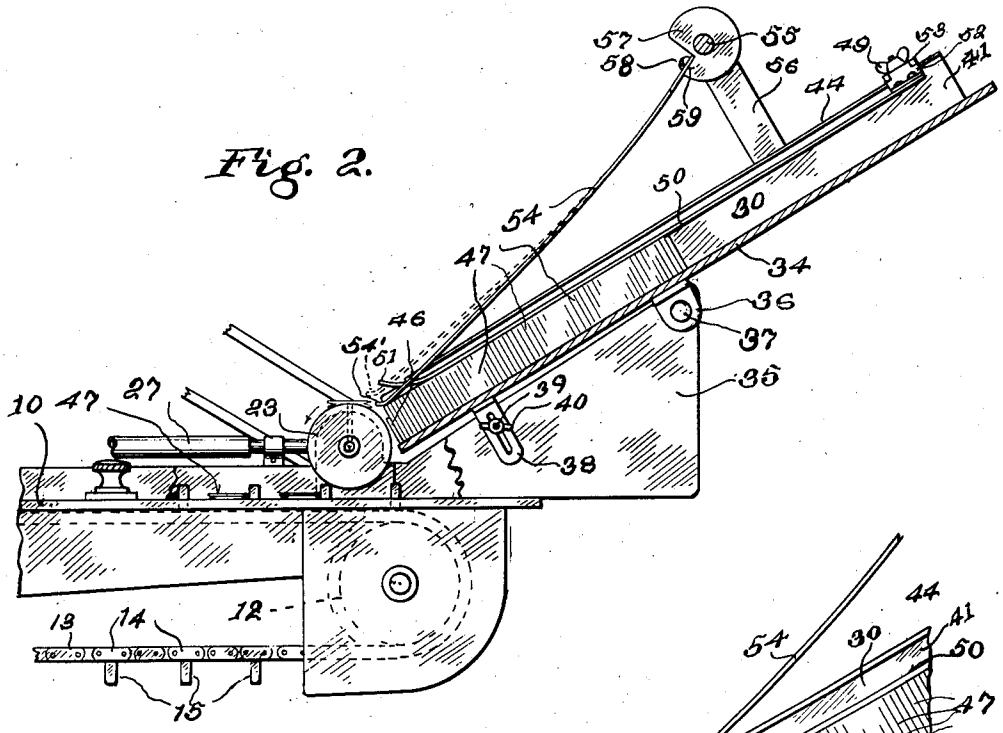
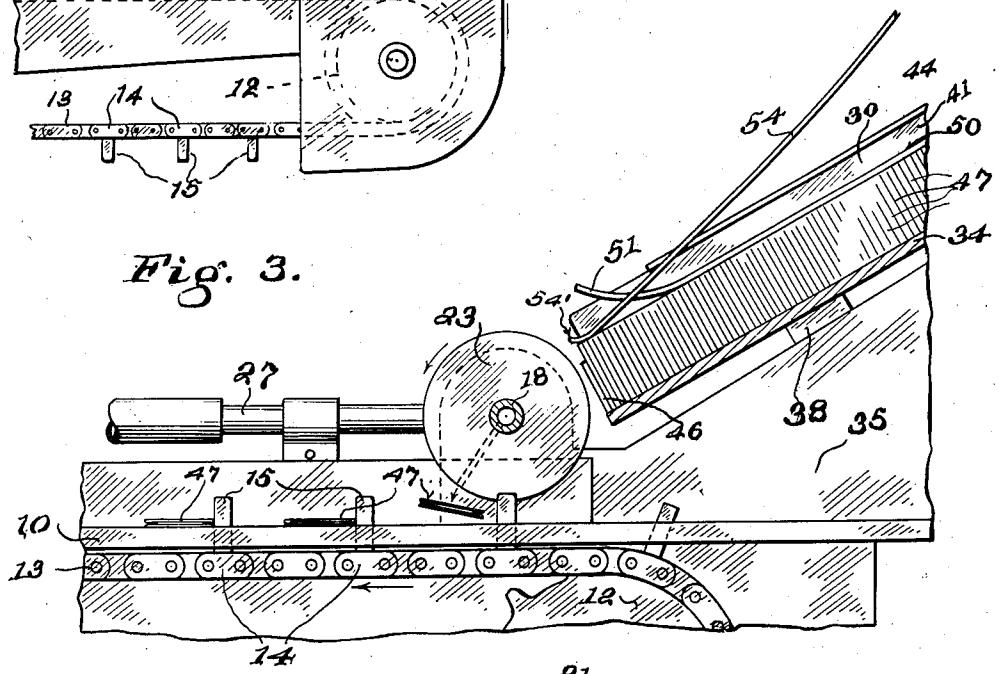


Fig. 3.



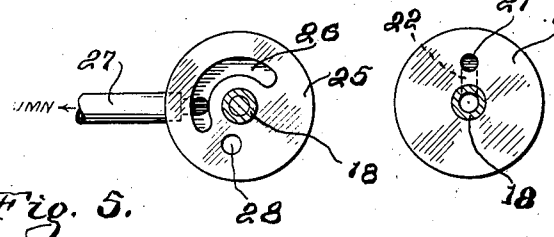


Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE

1,993,240

PNEUMATIC FEEDER

Charles N. Ciolino, Garfield, N. J., assignor to A. Gutierrez, Inc., Passaic, N. J., a corporation of New Jersey

Application October 27, 1932, Serial No. 639,920

7 Claims. (Cl. 271—12)

The invention relates to feeding devices for small articles which are to be removed from a stock or other accumulation of stock, and fed to apparatus for treating or printing or forming articles further. It is a special purpose to present a machine adapted to feed envelopes to a carrier, removing them from a stack, one at a time, and delivering them to a carrier adapted to hold them individually in a fixed position to receive an impression or other treatment.

It is an important aim of the invention to offer such a feeder peculiarly adapted to operate with the extremely thin and flimsy envelopes or "tubes" in which cigars are packed for retail sale.

It is also a purpose to construct a feeder which will require a minimum of space for the accommodation and movement of stock. A still further aim is to evolve a device for the functions required which will be extremely simple in construction, and readily tended by inexperienced operatives, as well as maintained in service at a low cost for repairs and replacements, which will be low in cost for manufacture and installation. It is also an important purpose to provide such apparatus which will be readily adaptable to various sizes of stock, and different materials.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention as will be understood from the following description and accompanying drawings, wherein

Figure 1 is a perspective view of one embodiment of the invention.

Figure 2 is a side elevation thereof with a part broken away.

Figure 3 is an enlarged detail of the roll at discharge position.

Figure 4 is a longitudinal section of the shaft, roll and mounting.

Figure 5 is a face view of the air suction and relief port block.

Figure 6 is a similar view of the rotating valve head of the roller shaft.

There is illustrated a machine including a table 10, which may be the platen or may be attached to the platen, of a stamping or printing machine, the details of which are not illustrated. The table has two parallel slots 11 therethrough and mounted on the under side of the table there is a pair of sprockets 12 carrying parallel conveyor chains 13 having links 14 at intervals from which the arms 15 project upwardly through the table slots, and above the table a suitable distance. These arms are uniformly spaced in each chain, and the arms of the two chains are transversely alined in pairs, each pair on a line at right angles to the slots 11.

At each side of the table bearings 16 and 17 are mounted, journalled in which there is a shaft 19 hollow throughout its middle part and beyond the bearing 16 at one side. Collars 19' are pinned to the shaft to retain it against sliding movement in the bearings, and immediately outward of the bearing 16 a rotating head 20 in the form of a thick metal disc is fixed on the shaft and suitably united therewith to seal the junction airtight. The head is formed with a planiform outer side face through which at a distance from the shaft a port 21 opens from a passage 22, leading into the shaft. On the middle part of the shaft there is mounted a feed roll 23 also sealed at its junction with the shaft, especially at the ends, and through the periphery of the roll at one line there is a longitudinal series of suction holes 24, communicating with the interior of the shaft, as shown. This roll has its lower periphery a distance below the upper extremities of the arms 15, and stops short of the table about half an inch, more or less, though it may be closer or more distant if desired. The roll is of a length slightly less than the distance between the slots 11, and is equally spaced therebetween. Set revolubly on the outer part of the shaft and abutting the head 20, there is a stationary manifold or suction and relief head or block 25 having a planiform inner face set snugly against the outer side face of the head 20. In the inner side face of this block 25 there is formed an arcuate channel 26 concentric with the shaft and spaced therefrom the same distance as the port 21, with which it registers on each rotation of the head 20. The channel extends over a radius of 170 degrees, more or less, this channel and the port 21 being so located with respect to the holes in the roll that in rotation of the roll and shaft counter clockwise as viewed in Figures 1, 2, and 3, the port 21 will enter into lap relation to the channel 26 when the holes 24 of the roll are moving upward past the chute or box 30 to be described. An air pipe 27 is engaged in a tapped opening in the periphery of the block 25 which communicates with the channel 26. The pipe 27 leads to an exhaust pump of any suitable kind, not illustrated, adapted to exhaust air through the shaft and pipe. Spaced a distance circumferentially from the channel at the same distance from the shaft,

and in the counter clockwise direction mentioned, there is a relief port 28 opening through the inner side face of the head 25 and also through the outer face thereof, communicating with the atmosphere.

The shaft 18 is extended a material distance outwardly of the head 25, and has mounted at the extremity a driven sprocket 29 on which there is engaged a chain which is to be operated from the same source as the conveyor chains 13, so that the roll rotates once for each pair of arms 15 passing thereunder.

The sprocket 29 is formed at the inner side with a suitable anti-friction device 31, and between this and the head 25 there is confined a helical spring 32 engaged around the shaft loosely or in spaced relation to the shaft, so that it compresses the block 25 against the head 20, while the shaft and head rotate.

An inclined stock chute or box 30 is mounted on the table, consisting of a planiform plate 34 set on the inclined upper edges of brackets 35 forming parts of the bearings 16 if desired, secured on the upper side of the table 10, and projecting longitudinally of the slots 11 outwardly from the table a distance. The plate has pivot ears 36 secured on the under side pivoted on pintles 37 at the extreme outer upper parts of the brackets so that it may be adjusted around this axis, and has depending flat longitudinally slotted tongue brackets 38 lying closely beside the brackets 35 and receiving therethrough the studs 39 having wing nuts 40 thereon by which the tongues 38 are clamped against the brackets 35 to hold the chute at adjusted positions. The lower or inner edge of the plate 34 swings very close to the roll 23, and has transversely adjustable on its upper face two parallel vertical guide strips or plates 41, each provided with laterally projected longitudinally slotted arms 42 fixed thereon and set snugly and slidably on the upper face of the plate 34. Studs 43 are set near the outer lateral edges of the plate 34 projecting upwardly through the slots of the arms, and having wing nuts 44 thereon by which the plates 41 are held in adjusted positions to accommodate wider or narrower stock. The upper edges of the plates 34 are turned in to form retaining flanges 45, which also stiffen the plates, these flanges stopping a distance inwardly from the lower edge of the plate 34. The end portions of the plates 41 are bent inwardly at right angles in a plane vertical to that of the plate 34 and alined with the lower edge of the latter plate, these inturned parts serving as foot flanges 46 to partly support stock lying between the plates 41, as will be further explained.

The stock 47 in the present instance consists of long narrow flat-folded tubes or envelopes such as are used for enclosing cigars, and are customarily formed of transparent cellulose material. The stock is arranged in a single stack one side of which lies upon the plate 34 with the longitudinal axes of the tubes extending transversely between the plates 41, the flanges 45 being spaced above the stock, and the end portions of the tube at the bottom of the stack resting upon the foot flanges 46 while the middle face portion of this bottom tube 47 may lie against or close to the roll 23.

The plates 41 are provided with out-turned flanges 48 at their upper ends longitudinally slotted and having adjustable thereon retainer strips 50 by means of thumbscrews 49, each consisting of a strip of thin sheet metal, planiform and rectilinear, resting on the top edges of the stock 47, the lower ends of the strips 51 being slightly curved upward from the stock. At their upper ends the strips are provided with lateral upwardly inclined arms 52 pivoted on sliding plates 53 held on the flanges 48 by the thumbscrews 49 and comprising the base pieces of the strips 50. By this arrangement the strips 50 may lie across the upper edges of the tube stock 47 throughout the chute, excepting the lowermost tubes.

In addition, stripper springs or fingers 54 are provided, mounted adjacent the upper end of the chute so as to press resiliently upon the lowermost tubes in the stock 47, and having attenuated extremities the terminal end portions 54' of which are turned upward on a short radius, so that while pressing on the next to the last tube in the stock, or upon the second or third adjacent one, the last one will be relieved of contact and the ends of the stripper will be inclined upwardly from the stock over the last tube. The strippers also terminate very close to the roll 23 and may project beyond the plane of the foot flanges 46. The mounting of the strippers consists of a transverse bar 55 mounted in upstanding brackets 56 at respective sides of the plate 34. Two collars 57 are revolubly and slidably mounted on the bar, and held adjustably thereon by set screws 58. The ends of the stripper fingers 54 are secured on flats 59 of these collars, so that by rotating adjustment of the collars the tension of the springs may be varied, and by sliding adjustment of the collars the strippers may be accommodated to the width of the stock between the plates 41.

In operation, a suitable exhaust being connected to the pipe 27 a vacuous condition will be produced at proper intervals or may be maintained in the channel 26, so that each time the port 21 laps the channel air will be drawn in through the holes 24 of the roll 23 causing the then adjacent bottom tube of the stock in the chute to be held firmly to the roll. The tube thus engaged and held on the roll will be thereby moved upwardly against the extremities of the strippers 54, lifting and flexing these slightly, the tube body being also caused to bend outwardly and move past the ends of the strippers. The tube will be carried over the top of the roll, being inverted from its original position, carried downwardly toward the table 10, and under the roll partly, where it will be discharged just in advance of two approaching arms 15. Before the tube is released or discharged from the roll, the port 21 will have passed beyond the channel 26 and will be closed against the face of the head 25 between the channel and the port 28 momentarily. The elasticity of air will cause the vacuous condition to be maintained in the roll and shaft 18, however, for a time, and the tube will consequently be held to the roll until the port 21 laps the port 28 by which atmospheric pressure is admitted to the roll, which will by air piston action cause the tube 47 on the roll to be discharged against the table 10 where it may be engaged by the next two arms 15 passing.

If desired, air under pressure may be supplied at the outer side of the port 28, so that more positive movement of the work from the roll is secured.

I claim:—

1. In a feed apparatus, an inclined stock chute for stacked articles, a transverse roll at the bottom thereof having its periphery presented to

the bottom of the stack, a means to rotate the roll, means below the roll to convey stock in a direction opposite the movement of the adjacent roll face, suction openings on the face of the roll in a longitudinal series of limited extent circumferentially of the roll, and means to exhaust air from said openings while opposed to the stack and during movement of the roll therefrom to a lower part thereof, and to release the work at the lower limit of feed movement under the roll.

2. The structure of claim 1 in which said means to convey stock is a conveyor device mounted for movement horizontally beneath said roll in a direction opposite that of the adjacent part of the roll, said conveyor having transversely spaced pairs of arms to engage articles from the roll.

3. The structure of claim 1 in which a plurality of stripper springs are mounted over the upper part of the chute, inclined downwardly toward the chute, and having attenuated extremities projected close to the roll spaced from the latter less than the thickness of a unit of stock to be fed, and being slightly curved upward at the extreme tips, whereby to press on the edges of stacked flat articles and the like close to the roll, and to engage an article when lifted by the roll and cause flexure of a flexible article and also yield thereto by flexure.

4. In a machine of the character described, the structure of claim 1 in which the roll is provided with a hollow coaxial shaft formed with a rotary valve head having a port thereon communicating with the interior of the shaft, a stationary block revoluble on the shaft adjacent the head having air passages arranged to lap with the port at times, a seat element fixed on the shaft outwardly of the block and a protractile spring confined between the seat element and the block, an air duct connection with the block, and means to rotate the shaft.

5. In a machine of the character described, the structure of claim 1 in which the roll is provided with a hollow shaft formed with a rotary valve head, having a plane face at right angles to the shaft having a port thereon communicating with the interior of the shaft, a stationary block revoluble on the shaft abutting the head and having air passages arranged to lap with the port at times, a seat element fixed on the shaft outwardly of the block and a protractile spring confined between the seat element and the block, an air duct connection with the block, and means to rotate the shaft.

6. A device of the character described, comprising a table, an endless conveyor having a reach movable across the table, a rotary hollow shaft journalled transversely over the conveyor, a roll thereon having a periphery close above the table and formed with a longitudinal series of air openings in the periphery communicating with the interior of the shaft, an inclined plate having its lower part close to the roll, to receive a stack of articles to rest at the periphery of the roll, laterally adjustable chute walls on the plate, and retainers consisting of resilient rectilinear spring strips adjacent each wall adapted to lie on stock between the walls and each having a lateral arm pivoted on the top edge of the adjacent wall.

7. In a feed for stacked flat material, an inclined plate, side walls laterally adjustable thereon to receive stock transversely therebetween, retainer support pieces longitudinally adjustable on the upper portions of the walls, arms pivoted on the support pieces movable into and outwardly of the space between the walls, and respective resilient rectilinear spring strips extended from the swinging ends of said arms, downwardly to the chute, shaped and positioned to lie flat across the edges of stock arranged transversely in the chute.

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