July 1, 1930. A. G. ROSE 1,769,650

APPARATUS FOR FEEDING CIGARETTES OR LIKE ARTICLES

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Fig.1.

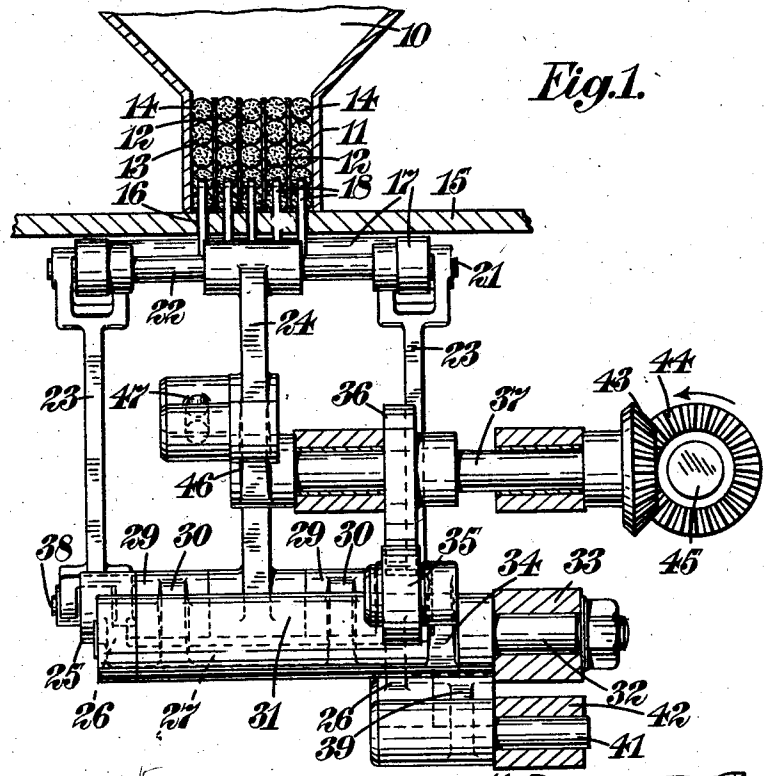
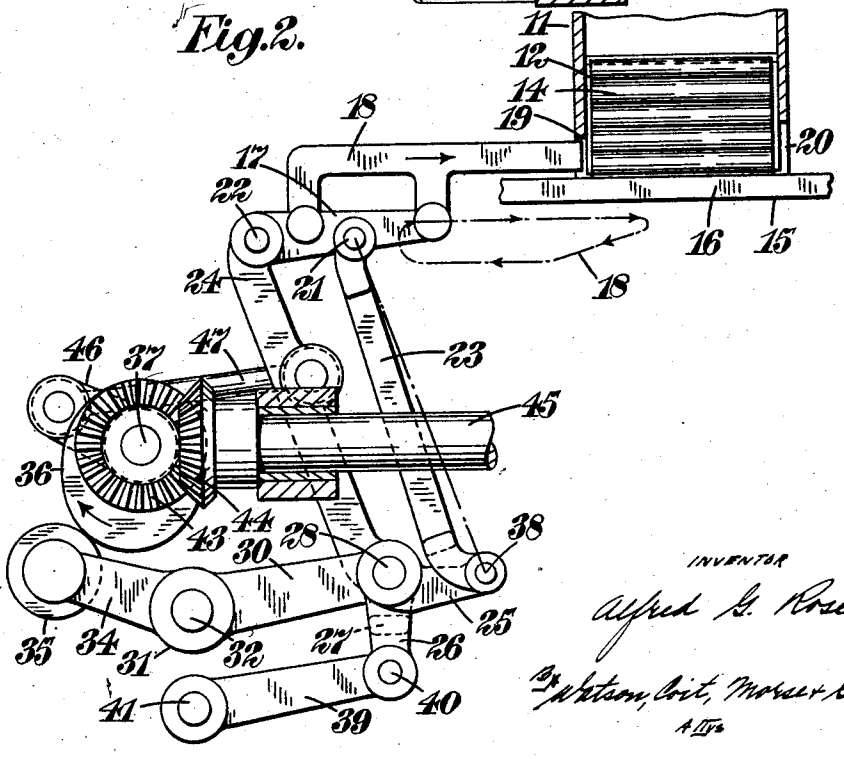



Fig.2.




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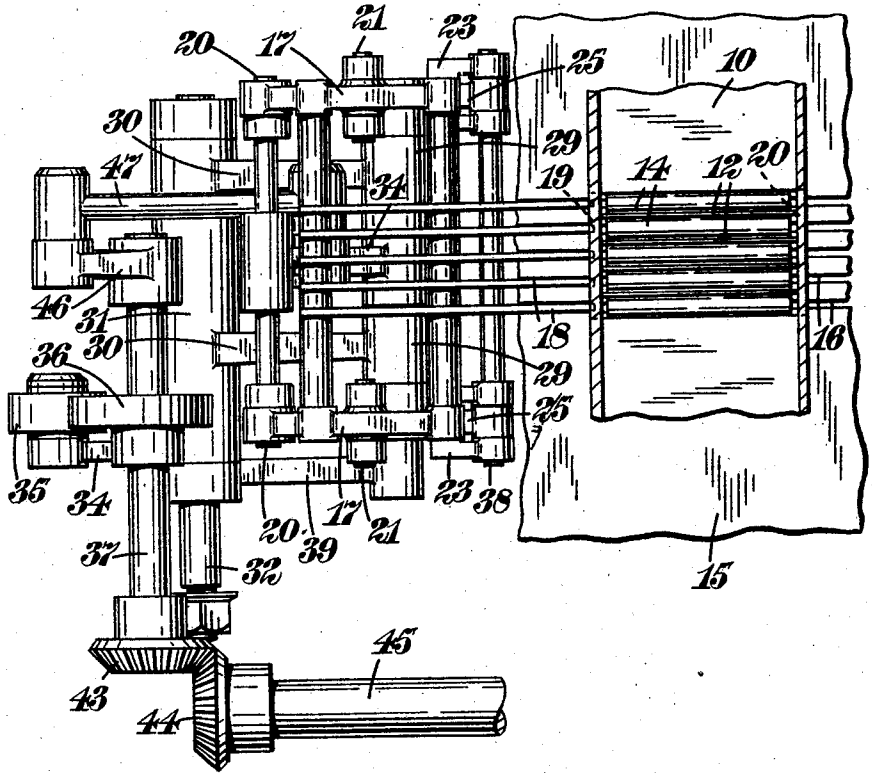
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*Fig.3.*




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APPARATUS FOR FEEDING CIGARETTES OR LIKE ARTICLES

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Fig.4.

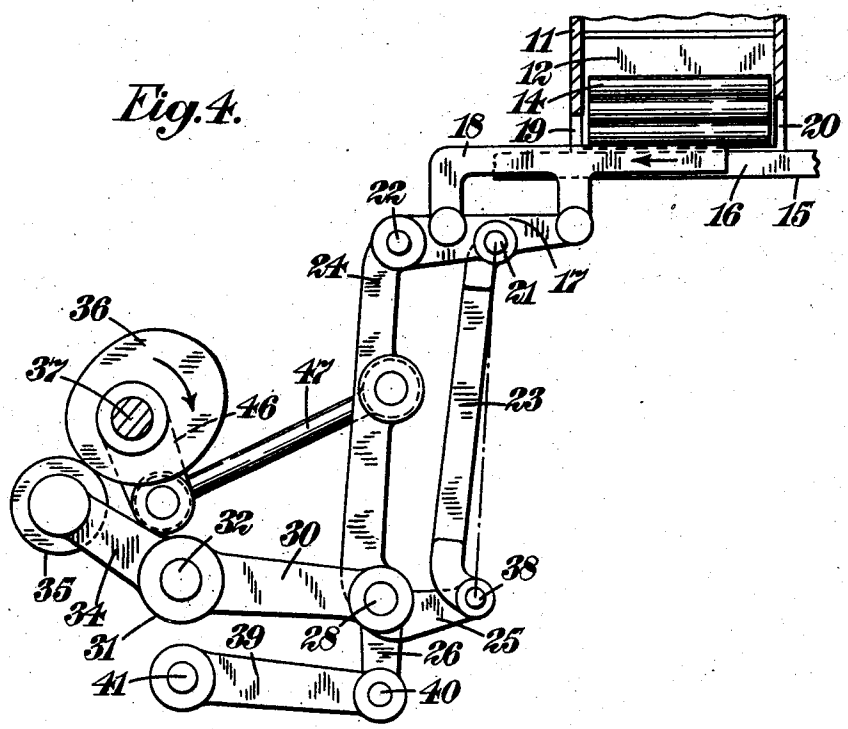
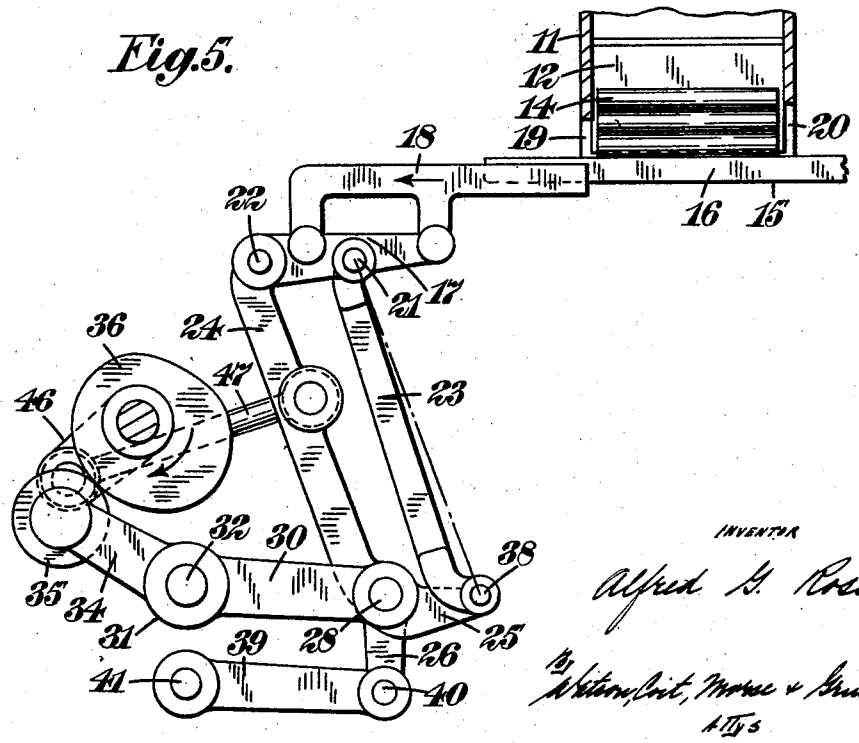



Fig.5.




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# UNITED STATES PATENT OFFICE

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## APPARATUS FOR FEEDING CIGARETTES OR LIKE ARTICLES

Application filed May 7, 1929, Serial No. 361,203, and in Great Britain May 24, 1928.

This invention is for improvements in or relating to apparatus for feeding cigarettes or like articles, i. e. articles of similar shape, all of which articles for brevity will be referred to hereinafter as "cigarettes."

This invention relates to apparatus for feeding cigarettes or articles of similar shape, wherein the articles to be fed pass from a hopper down a series of channels to a support-member and are conveyed one row, or more than one row, at a time, by means of a pusher or pushers provided on a reciprocating carrier, continuously travelling chain or the like, from the said support-member to a conveyor-channel, receiving-element, or the like.

According to the present invention there is provided in cigarette-feeding apparatus of the type described, means operable after the removal of a batch of cigarettes from the magazine to support the remaining cigarettes therein and to lower them on to the feed table or the like in such manner that they are maintained substantially horizontal during said lowering movement.

The invention is particularly concerned with cigarette-feeding apparatus comprising a hopper which communicates with a magazine that is divided by partitions into a number of vertical compartments into which the cigarettes pass, each compartment being arranged to receive one or more rows of superposed cigarettes, a table located beneath said magazine and onto which the lowermost horizontal row of cigarettes falls, and a reciprocating pusher arranged to push the lowermost horizontal row (or two or more horizontal rows) of cigarettes endwise through an opening in a wall of the magazine onto a conveyor or to a location where they are to be subsequently dealt with, for example, packeted.

In such known apparatus, the forward and backward movements of the reciprocating pusher have been made in one and the same horizontal plane, and it has been found in practice that during the backward movement of the pusher, the front ends of the lowermost horizontal row of cigarettes in the magazine fall onto the table while the rear ends thereof are still supported by the pusher with the result that the descent of the cigarettes in the various compartments of the magazine is irregular and the cigarettes are apt to become wedged or jammed in said compartments and the operation of the apparatus to become uncertain and unreliable.

The aforesaid disadvantage is obviated by the present invention according to which the descent of the cigarettes in the magazine is controlled by means which as described above support the cigarettes and maintain them horizontal while they are lowered on to the feed table. To this end, the reciprocating pusher may be movable horizontally to feed a batch of cigarettes from the magazine and vertically to lower the cigarettes above said batch on to the feed table.

In a convenient construction, the pusher is movable to advance through the bottom of the feed magazine (thereby discharging a batch therefrom) and to return at a level below the upper surface of the feed table, and means are provided to maintain the pusher horizontal throughout its entire travel.

For a more complete understanding of the invention one embodiment thereof will now be described by way of example, with reference to the accompanying drawings in which:—

Figure 1 is an end elevation partly in section of the apparatus,

Figure 2 is a side elevation partly in section,

Figure 3 is a plan, and

Figures 4 and 5 are side elevations showing certain parts of the pusher-operating mechanism in different positions to that shown in Figure 2.

Like reference numerals indicate like parts throughout the drawings.

The apparatus comprises a hopper 10 which is charged with cigarettes by hand or otherwise as may be convenient. This hopper communicates with a magazine 11 which is divided by vertical partitions 12 into five compartments 13 each adapted to contain one row of superposed cigarettes 14. It will be understood that the cigarettes gravitate from the hopper into said compartments,

but for convenience no cigarettes are shown in the hopper. The lower end of the magazine 11 is open and adjacent thereto is a table 15 having five slots 16 therein each of which extends in a direction parallel to the axes of the cigarettes in the corresponding compartment 13, is narrower than said compartment, and is arranged centrally thereof. On a pusher 17 are mounted five pushing fingers 18 in the form of thin blades of rectangular cross-section with their longer sides vertical. Each of said pushing fingers is appropriated to one of the compartments 13 and each is arranged to discharge two cigarettes therefrom. An opening 19 is provided in one wall of the magazine 11 to permit the passage of the pushing-fingers 18, and an opening 20 through which the cigarettes are discharged is provided in the opposite wall of said magazine.

The pusher 17 carries two spindles 21, 22. On the spindle 21 two links 23 are pivotally mounted at their upper ends, and a link 24 is pivotally mounted at its upper end on the spindle 22. A bell-crank element having two horizontal arms 25 and two vertical arms 26 connected by a bridge-member 27 is mounted on a spindle 28 carried in bearing-bosses 29 on the corresponding ends of two arms 30, which arms extend from a boss 31 pivotally mounted on a spindle 32 supported in a bracket 33. An arm 34 extends from the boss 31 and carries at its outer end a roller 35, which engages a cam 36 on a shaft 37. The lower end of the link 24 is pivotally mounted on the spindle 28, and the lower end of each of the links 23 is pivotally mounted on a spindle 38 carried in the outer ends of the horizontal arms 25 of the aforesaid bell-crank element. The weight of the links 23 and 24 and the connected elements, aided if necessary by a spring or the equivalent, acts to retain the roller 35 in operative engagement with the cam 36. A link 39 is pivotally mounted at one end on a pin 40 carried by one of the vertical arms 26 of the aforesaid bell-crank element (which arm is longer than the other) and at its other end on a stud 41 mounted in a bracket 42.

The shaft 37 is rotated by means of a bevel wheel 43 thereon which meshes with a bevel wheel 44 on a shaft 45 which may be driven by any convenient means. A crank 46 is secured to the shaft 37 and is operatively connected by a connecting rod 47 to the link 24.

The pivotal points of the links 23 and 24 are so arranged that said links together with the pusher 17 and the horizontal arms 25 of the aforesaid bell-crank element constitute a parallel-motion device. Similarly the pivotal points of the arms 30 and 39 are arranged so that these arms form part of a second parallel-motion device. When the shaft 37 is rotated the conjoint action of the said parallel-motion devices causes the pusher 17 to remain horizontal while continuously travelling in a closed path indicated by the chain line 48 in Figure 2. It will be appreciated that the shape of said path depends upon the shape of the cam 36 and the throw of the crank 46.

The operation of the apparatus is as follows:—Assuming that the various parts of the apparatus occupy the positions shown in Figures 1, 2 and 3, when the shaft 37 is rotated the pusher 17 moves forwardly and the pushing-fingers 18 discharge a batch of ten cigarettes through the opening 20 in the front wall of the magazine 11 and push said batch along the table 15 to a conveyor or other receiving-member to be subsequently dealt with. During the time that the pushing-fingers are moving forwardly they are located above the feed-table 15 and advance through the magazine 11, and the cigarettes in the lowermost horizontal row above the batch which is being discharged rest on the upper horizontal surfaces of said pushing-fingers. Consequently the cigarettes contained in the various compartments 13 of the magazine above the said horizontal row also remain horizontal. As soon as convenient after the aforesaid batch of cigarettes has been pushed out of the magazine, the pushing-fingers move downwardly and rearwardly in the slots 16 in the table as shown in Figure 4 so that the cigarettes supported by the pushing-fingers are gradually lowered until the lowermost row thereof comes to rest on the table 15. The cigarettes while being thus lowered are supported in a horizontal position by the pushing fingers, and thus the risk of them becoming jammed in the magazine is eliminated. The pusher 17 descends until the pushing-fingers are below the level of the upper surface of the feed-table and continues its rearward movement as shown in Figure 5. When the pushing-fingers are clear of the magazine, the pusher returns to the position shown in Figure 2 to discharge the next batch of cigarettes from the magazine. This cycle of operations is repeated continuously, and the pushing-fingers remain horizontal thoughout the whole of their travel.

The invention is not restricted to the precise constructional details described as various changes can be made without departing from the invention.

I claim:

1. In apparatus of the type described for feeding cigarettes or similar articles, the combination of a magazine to contain a supply of the articles aforesaid, a pusher located at the lower end of the magazine and means for operating the pusher to eject a batch of cigarettes from the magazine by horizontal movement therefrom and subse-

quently to lower the articles superimposed on that batch to the base of the magazine by vertical movement of a nature such that the articles are maintained horizontal during the lowering movement.

2. In apparatus of the type described for feeding cigarettes or similar articles, the combination of a magazine to contain a supply of the articles in a plurality of superimposed batches, a feeding device located at the lower end of the magazine and arranged to make end-on engagement with the lowermost batch of articles therein and at the same time to support upon its upper surface the batches which are above the one with which the pusher makes end-on engagement, means for reciprocating the pusher horizontally to eject the batches one at a time from the magazine, and means for lowering the pusher at the end of each forward feeding stroke in such manner as to lower the articles supported by it to the base of the magazine while maintaining said articles substantially horizontal.

3. In apparatus of the type described for feeding cigarettes or similar articles, the combination of a magazine to contain a supply of the articles aforesaid in a plurality of superimposed batches, a support upon which the lowermost articles in the magazine are adapted to rest, a pusher located at the lower end of the magazine and so constructed as to make end-on engagement with the lowermost batch of articles and to support upon its upper surface the superimposed batches, and means for operating the pusher first to advance through the bottom of the magazine ejecting a batch therefrom, and then to return at a level below the upper surface of the support aforesaid, and means to maintain the pusher horizontal throughout its entire travel.

4. In a cigarette feeding apparatus of the type described, the combination of a magazine divided by partitions into a plurality of vertical compartments down which the cigarettes are adapted to gravitate, a table located beneath said magazine to support the lowermost row of cigarettes therein, an ejecting pusher located at the lower end of the magazine and comprising a plurality of fingers, one appropriated to each of the vertical compartments aforesaid, arranged to make end-on engagement with the lowermost row of cigarettes in the magazine and to support upon their upper surfaces the superimposed rows, and means to reciprocate the pusher in such manner that the fingers aforesaid advance horizontally through the magazine to eject the lowermost row therefrom and at the end of each advance as aforesaid descend to lower the super-imposed rows on to the table aforesaid while maintaining them substantially horizontal.

5. In cigarette feeding apparatus of the type described the combination of a magazine to contain a supply of cigarettes in a plurality of superimposed rows, a pusher located at the lower end of the magazine and adapted to make end-on engagement with the lowermost row of cigarettes therein and to support on its upper surface the superimposed rows, means for reciprocating the pusher in a closed path to advance through the magazine in end-on engagement with the lowermost row and then to descend to a lower level and to return to its initial position, and a parallel motion linkage operatively connected to the pusher and arranged to maintain it substantially horizontal during its entire travel.

In testimony whereof I affix my signature.

ALFRED GERMAN ROSE.