May 23, 1939. J. W. CHALMERS 2,159,132

APPARATUS FOR FEEDING CIGARETTES AND OTHER ARTICLES OF SIMILAR SHAPE

Filed Jan. 26, 1937 3 Sheets-Sheet 1

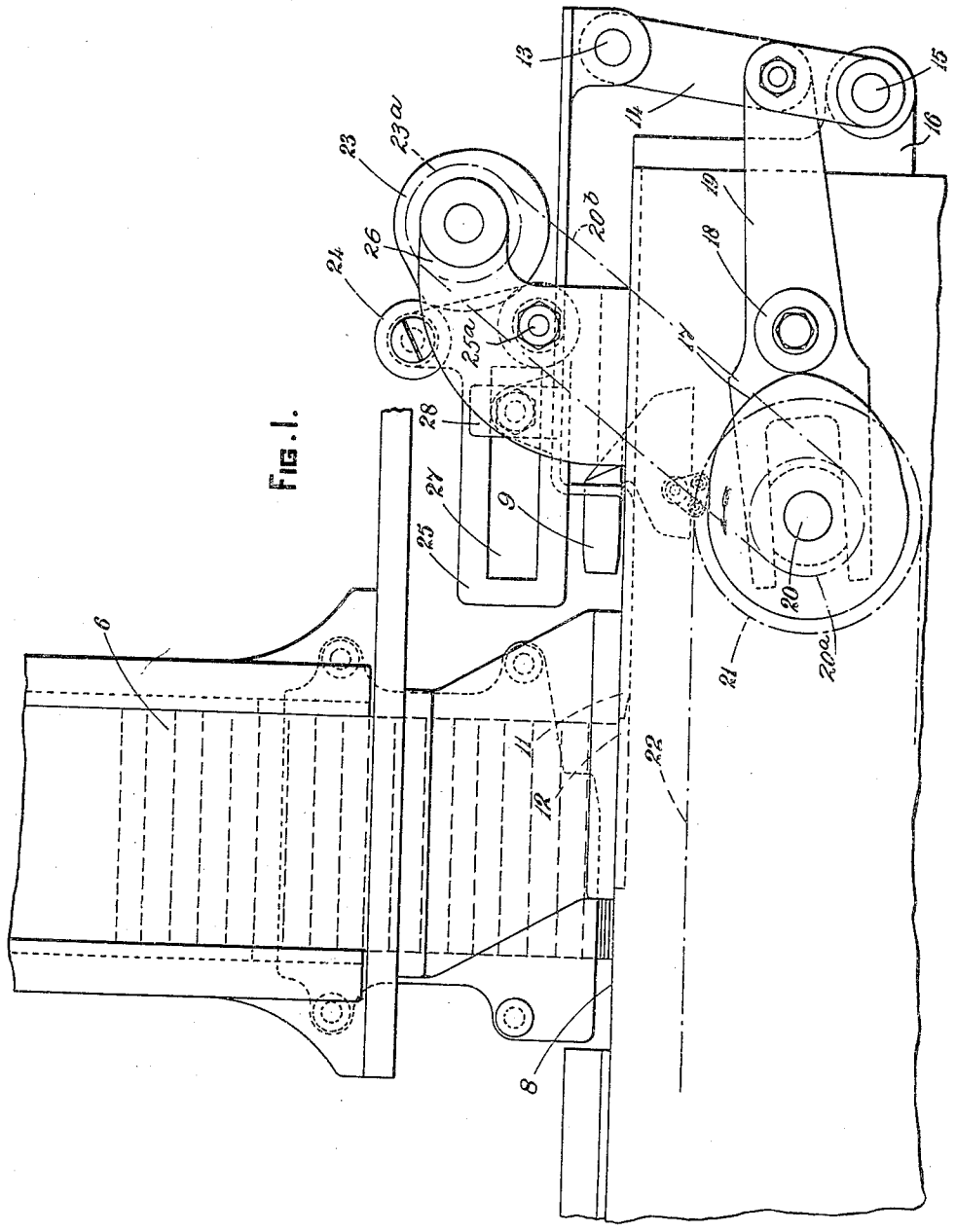

FIG. 1.

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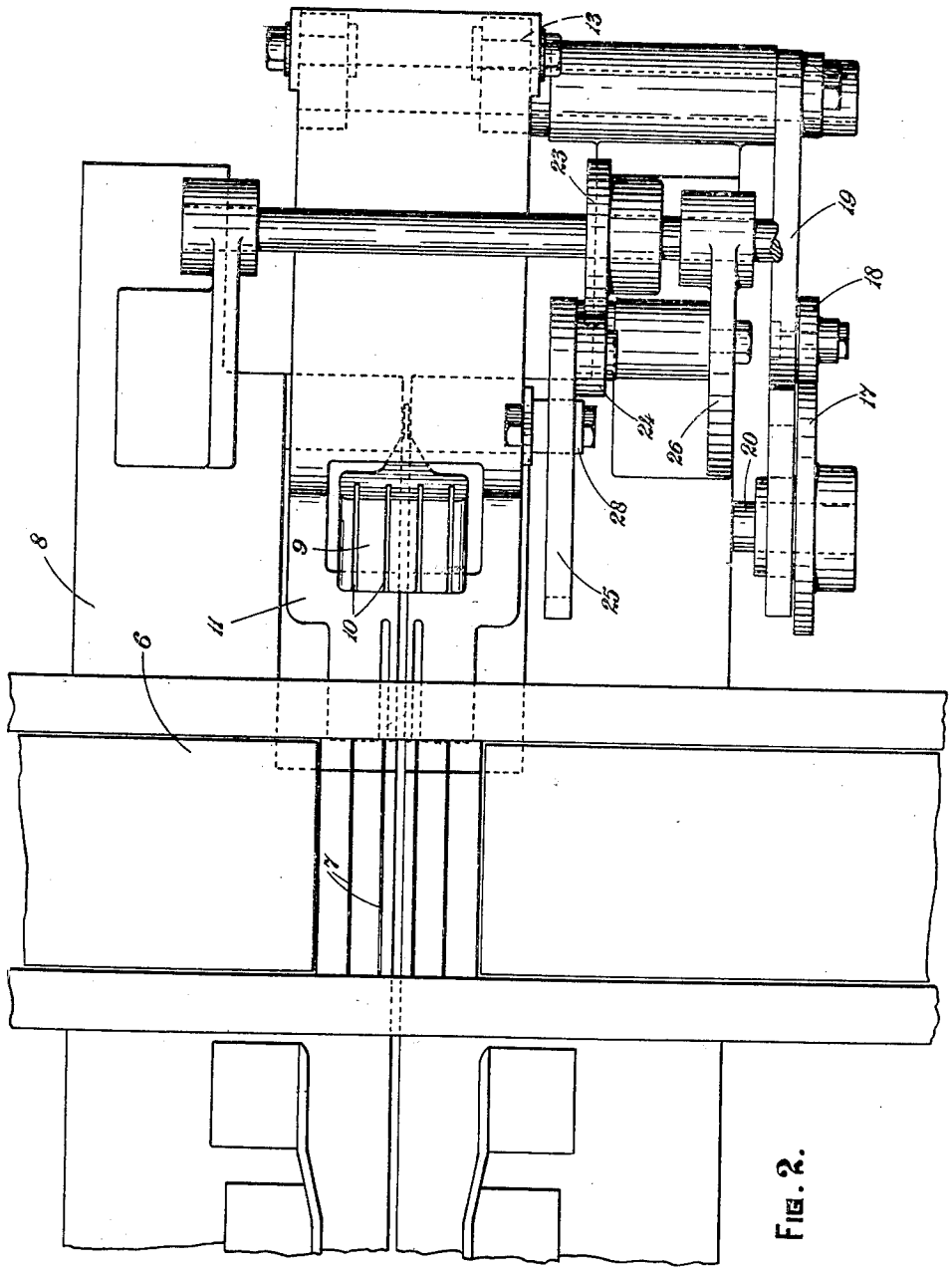

FIG. 2.

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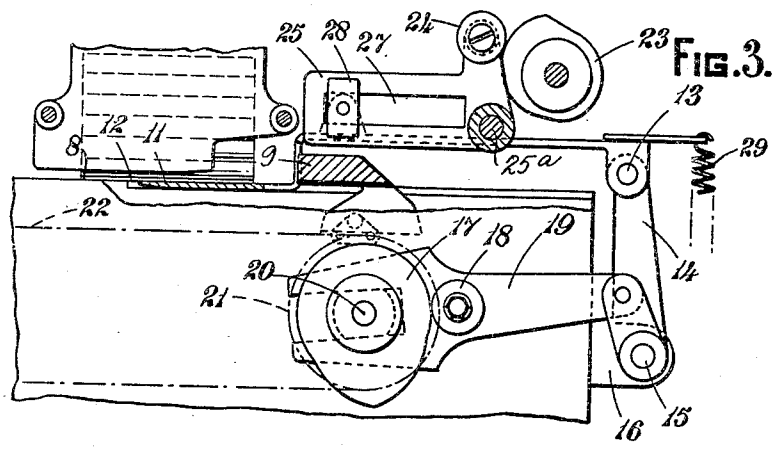

FIG. 3.

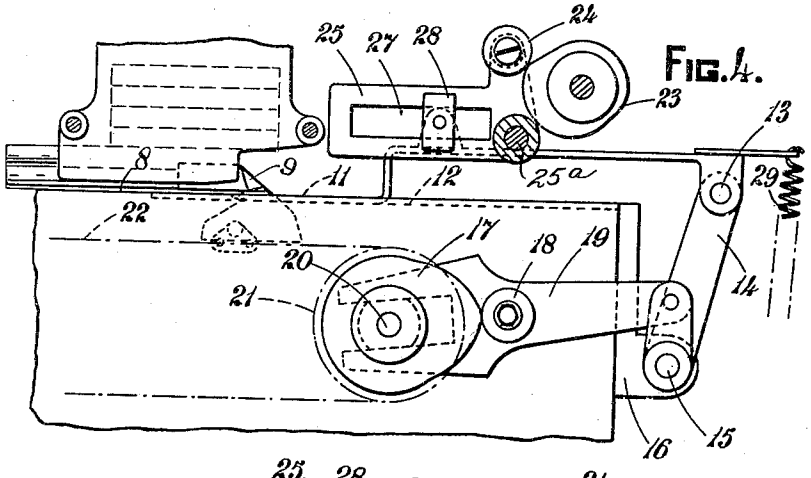

FIG. 4.

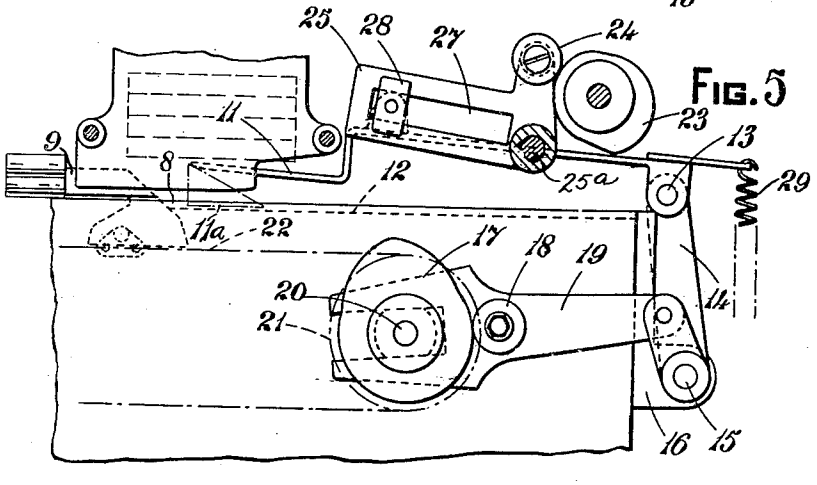

FIG. 5

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UNITED STATES PATENT OFFICE

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APPARATUS FOR FEEDING CIGARETTES AND OTHER ARTICLES OF SIMILAR SHAPE

John Walker Chalmers, Deptford, London, England, assignor to Molins Machine Company, Limited, Deptford, London, England

Application January 26, 1937, Serial No. 122,475.
In Great Britain February 6, 1936

5 Claims. (Cl. 214—8.5)

This invention is for improvements in or relating to apparatus for feeding cigarettes or other articles, e. g. articles of a shape similar to that of a cigarette.

When feeding cigarettes to a packing machine or a wrapping machine it is customary to deliver the cigarettes on to the bed of the machine by feeding them in vertical rows with the longitudinal axes of the cigarettes substantially parallel with the bed of the machine between guides disposed between a hopper and the bed of the machine. Batches of cigarettes are formed by removing one or more of the lowermost cigarettes from each of the vertical rows. The batch is usually removed by a conveyor which passes over the bed of the machine and between the guides.

It is an object of the invention to provide an improved apparatus for gently lowering on to the bed of the machine cigarettes which remain between the guides when a batch has been removed from therebetween and to control the cigarettes while they are being so lowered.

The invention will be described by way of example with reference to the accompanying drawings in which:

Figure 1 is a side elevation of a part of a cigarette packing machine, and illustrates mechanism by means of which the cigarettes are fed to the machine.

Figure 2 is a plan of Figure 1.

Figures 3, 4 and 5 are views showing some of the mechanism illustrated in Figure 1, drawn to a smaler scale and showing the mechanism in various positions which it occupies during its operation.

Like references refer to like parts throughout the specification and drawings.

Referring to the drawings, cigarettes are contained in a hopper 6, and the cigarettes pass between guide elements 7 shown in the drawings as vanes or partitions, and move towards a supporting member which in the drawings comprises the bed 8 of the machine. A pusher piece 9 is mounted on an endless chain 22, for continuous movement through an endless path. The pusher piece 9 is movable over the supporting member 8, as can be seen from Figures 1, 3, 4 and 5, and between the guide elements 7, the pusher piece being provided with slots 10 (see Figure 2) to permit this latter movement. The pusher piece 9 may be arranged to remove only the lowermost row of cigarettes from between the guide elements 7, or it may be arranged to remove from between the guide elements a batch comprising a plurality of superimposed rows, such for example as a batch comprising two rows of cigarettes.

A cigarette engaging member 11 is arranged to oscillate between the supporting member formed by the bed 8 of the machine and those cigarettes which are wholly above the pusher piece whilst the pusher piece is obstructing the path which is to be traversed by the cigarettes as they move towards the supporting member. By reference to Figures 3, 4 and 5 it will be seen that the cigarette engaging member 11 when in its lowermost position is arranged to move into an aperture 12 formed in the supporting member 8, so that the articles may be positively lowered by the member 11 until the cigarette engages with the supporting member. When in its lowermost position the cigarette engaging member forms part of the support for the cigarettes and the member 11 is provided with a slot to permit the pusher piece 9 to pass over the member 11 whilst the latter is in its lowermost position.

As shown in Figure 5, the member 11 is moved in a path 11*a* which is traced out by the tip end of the member 11 and comprises a substantially right angled triangle, the operation of the member 11 being described below. The member 11 is pivoted at 13 to an arm 14 which comprises a carrier for the cigarette engaging member 11, the arm 14 also being secured to a spindle 15 journalled in a bracket 16 secured to the supporting member 8. The arm 14 is oscillated about the axis of the spindle 15 by a cam 17, which cam cooperates with the roller 18 journalled on a link 19 which is connected with the spindle 15 thereby causing the pivot 13 and the member 11 to be moved at predetermined intervals in the direction of movement of the pusher piece 9 and in a direction reverse thereto. As will be seen from the drawings, the cam 17 is secured to the spindle 20 to which the sprocket 21 which drives the conveyor chain 22 is secured. By this arrangement it will be seen that the member 11 is operated horizontally in timed relationship with the pusher piece 9, and the cam 17 is arranged to impart to the member 11 a component of movement in the direction of movement of the pusher piece 9 while the latter is passing between the guide elements 7 and while the member 11 is moving upwardly along the hypotenuse of the triangular path. Downward movement of the member through that part of the triangular path which is substantially perpendicular to the supporting member 8 is effected by a cam 23 which is rotated in timed relationship with the cam 17 and sprocket 21, the cam 23 cooperating with a roller

24 journalled in a rocker 25 pivoted at 25a to a bracket 26 and causing the member 11 to be moved about the pivot 13. The cam 23 is rotated from the shaft 20 by sprocket wheels 20a and 23a, the sprocket wheels being connected by a chain 20b and the sprocket wheel 20a being secured to a shaft 20. A spring 29 is provided to maintain the rollers 18 and 24 in contact with the cams 17 and 23 respectively and also urges the member 11 upwardly while the latter has a component of movement in the direction of movement of the pusher element 9. The rocker 25 is provided with a slot 27. A sliding member 28 engages with the slot 27 and is secured to the member 11. The slotted rocker comprises a guide for the sliding member 28.

While the pusher piece 9 is moving between the guide elements 7, it supports those cigarettes which are above it until it has passed over the member 11, whereupon the latter rises as shown in Figure 5, and engages with and supports those cigarettes which are wholly above the pusher piece 9. The member 11 is, while the pusher piece is moving thereover, being moved along the base of the triangular path 11a in a direction reverse to that in which the pusher piece is moving so that it may be free to rise and to engage the cigarettes above the pusher piece as soon as possible. As can be seen from Figures 3 to 5, the member 11 is arranged to engage the cigarettes along a distance which is greater than half their length to control them while they are being lowered. When the pusher piece 9 is moved completely out of the space directly below the stack of cigarettes, the cam 23 causes the member 11 to move downwardly into the position shown in Figures 1 and 3, thereby lowering the cigarettes between the guide elements positively and gently on to the supporting member and into position to be engaged by the pusher piece.

It will be seen from Figures 3, 4, and 5 that when the member 11 moves downwardly it moves in a path substantially at right angles to the supporting surface of the supporting member 8, because the downward distance through which the member 11 travels is relatively short and the position of the pivot 13 during the downward movement is such that the axis of the pivot is disposed substantially centrally of the downward path and at a distance therefrom such that the arc made by the member 11 moving downwardly about the pivot is substantially a straight line.

From Figures 3 and 5 it will be seen that the cam 17 is so shaped that the pivot is arranged to dwell in one position during the downward movement of the member 11.

What I claim as my invention and desire to secure by Letters Patent is:

1. In apparatus for feeding cigarettes, guides between which cigarettes pass substantially vertically downwards, a support to which the cigarettes are delivered, a pusher element movable over the support to remove a batch of cigarettes from between said guides, a pivoted cigarette engaging member to engage the cigarettes above the pusher element when the latter has partly removed a batch of cigarettes from between the guides and to lower the cigarettes between the guides to said support after removal of the batch from between the guides, means to move the pivot of the cigarette engaging member in the direction of movement of the pusher element and in a direction reverse thereto and means operative in timed relationship with said last named means to move the cigarette engaging element about its pivot in a vertical plane, said pivot being so disposed between the support and the position at which the cigarettes between the guides are first engaged by said member and at such a distance from said position that that part of the member which engages the cigarettes is moved downwardly in a path approximately perpendicular to the support.

2. In apparatus for feeding cigarettes, guides between which cigarettes pass substantially vertically downwards, a support to which the cigarettes are delivered, a pusher piece movable over the support to remove a batch of cigarettes from between said guides, a movable carrier, a cigarette engaging element movable with the carrier and pivoted thereto for movement relatively to the carrier in a vertical plane, a guide pivoted about a fixed axis for movement in a vertical plane, a connecting member connecting the cigarette engaging member and said guide, said connecting member being movable relatively to the guide, a cam operative in timed relationship with the pusher piece to impart to the carrier a component of movement in the direction of movement of the pusher piece after the latter has partly removed a batch from between the guides, means to move the cigarette engaging member upwardly about its pivot while the carrier has said component of movement to engage the cigarettes above the pusher piece, and a further cam operative in timed relationship with the first mentioned cam to move the cigarette engaging member downwardly about its pivot in a path approximately perpendicular to said support to lower on to the support cigarettes remaining between the guides after a batch has been completely removed from therebetween by the pusher piece.

3. In apparatus for feeding cigarettes, guides between which cigarettes pass substantially vertically downwards, a support to which the cigarettes are delivered, a pusher piece movable over the support to remove a batch of cigarettes from between said guides, a movable carrier, a cigarette engaging element movable with the carrier and pivoted thereto for movement relatively to the carrier in a vertical plane, a guide pivoted about a fixed axis for movement in a vertical plane, a connecting member connecting the cigarette engaging member and said guide, said connecting member being movable relatively to the guide, a cam operative in timed relationship with the pusher piece to impart to the carrier a component of movement in the direction of movement of the pusher piece after the latter has partly removed a batch from between the guides, means to move the cigarette engaging member upwardly about its pivot while the carrier has said component of movement to engage the cigarettes above the pusher piece, and a further cam operative in timed relationship with the first mentioned cam and while the carrier is stationary to move the cigarette engaging member downwardly about its pivot in a path approximately perpendicular to said support to lower on to the support cigarettes remaining between the guides after a batch has been completely removed from therebetween by the pusher piece.

4. In apparatus for feeding cigarettes, guides between which cigarettes pass substantially vertically downwards, a support to which the cigarettes are delivered, a pusher piece movable over the support to remove a batch of cigarettes from between said guides, a cigarette engaging mem-

ber movable upwardly in timed relationship with the pusher piece and with a component of movement in the direction of movement of the pusher piece to engage the cigarettes above the pusher piece after the latter has partly removed a batch from between the guides and movable downwardly in a path approximately perpendicular to the support to lower on to the support cigarettes remaining between the guides after a batch has been completely removed from therebetween by the pusher piece, and means for so moving said cigarette engaging member.

5. In apparatus for feeding cigarettes, guides between which cigarettes pass substantially vertically downwards, a support to which the cigarettes are delivered, a pusher piece movable over the support to remove a batch of cigarettes from between said guides, a cigarette engaging member movable upwardly in timed relationship with the pusher piece and with a component of movement in the direction of movement of the pusher piece to engage the cigarettes above the pusher piece after the latter has partly removed a batch from between the guides and movable downwardly in a path approximately perpendicular to the support to lower on to the support cigarettes remaining between the guides after a batch has been completely removed from therebetween by the pusher piece, said member engaging the cigarettes along a distance greater than one-half their length to control them while they are being lowered, and means for so moving said cigarette engaging member.

JOHN WALKER CHALMERS.