April 9, 1940. G. D. HORGAN 2,196,769

PACKETING MACHINE FOR CIGARETTES AND THE LIKE

Filed July 29, 1937 3 Sheets-Sheet 1

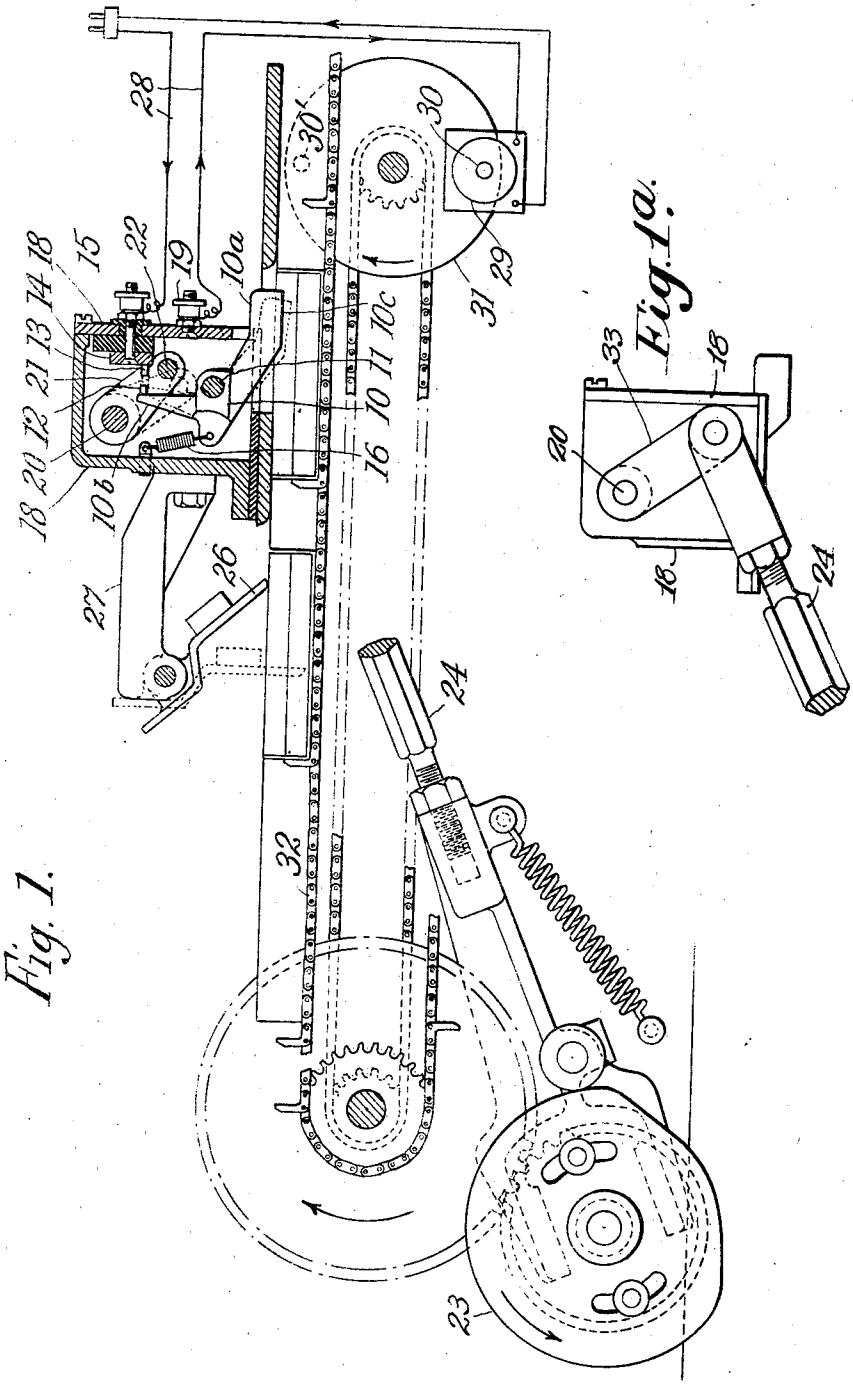


Fig. 1.

Fig. 1a.

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Filed July 29, 1937 3 Sheets-Sheet 2

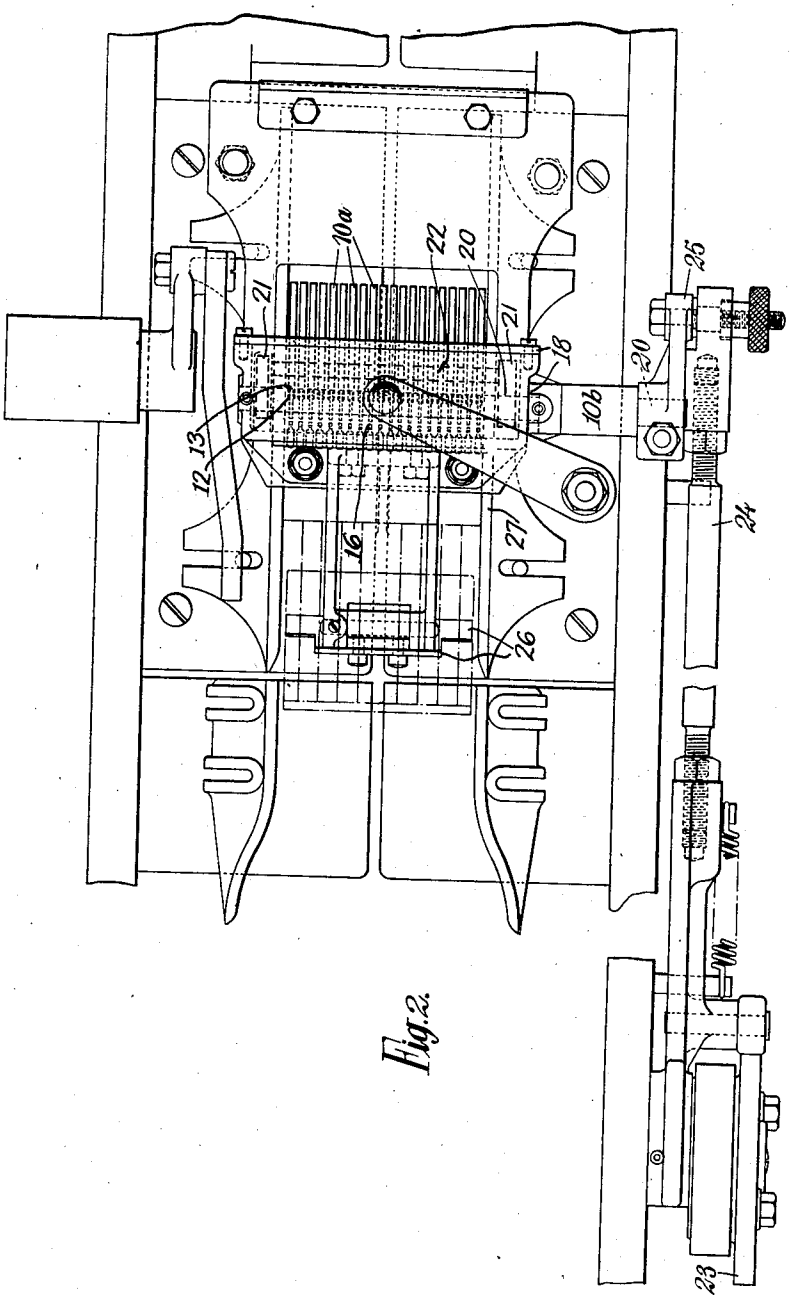


Fig. 2.

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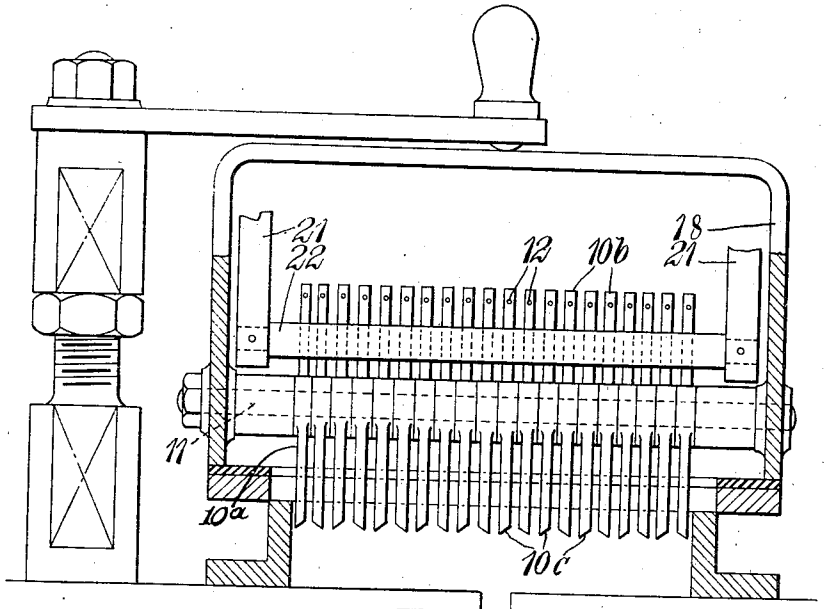


Fig. 3.

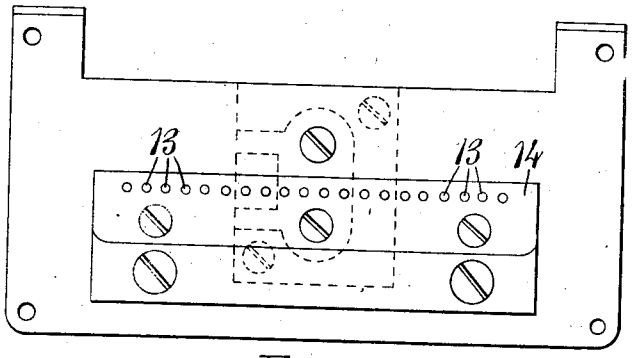


Fig. 4.

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UNITED STATES PATENT OFFICE

2,196,769

PACKETING MACHINE FOR CIGARETTES AND THE LIKE

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Application July 29, 1937, Serial No. 156,347
In Great Britain August 1, 1936

5 Claims. (Cl. 226—5)

This invention relates to packeting machines for cigarettes or like articles and has particular reference to detecting when a bundle is deficient in number whereby means may be set for subsequently ejecting the faulty packet.

Hitherto in such devices the cigarettes in the bundle in passing below detector fingers lift the fingers and thus the ends of the cigarettes are subject to pressure and are liable to become damaged, and an object of the present invention is to provide an improved method of and means for detecting whereby such damage is obviated.

A further object is to provide an improved form of detector whereby the detection is effective irrespective of the displacement of the cigarettes in the bundle due to the absence of one or more cigarettes therefrom.

According to the present invention displaceable detector fingers or elements are provided beneath which the bundles of cigarettes pass on their way to the packing means, and controlling means are provided adapted to raise the fingers until a bundle is in the detecting position whereupon the fingers are lowered to engage the cigarettes and again raised before the cigarettes leave the detecting position whereby the fingers are prevented from engaging the cigarettes at their ends.

The control means may be operated mechanically, electrically or by pneumatic means.

Preferably the control means are operated by cam means synchronised with the travel of the cigarette bundles whereby the fingers are raised until a bundle of cigarettes is located below the fingers.

According to another feature of the invention the detector fingers are arranged in pairs, one pair for each cigarette in the row, the ends of each pair being curved or shaped to agree substantially with the curve of the cigarette.

In the accompanying drawings,

Figure 1 is an elevation of a detector device according to the invention;

Fig. 1*a* is a fragmentary detail view in side elevation, showing the connection for operating the shaft 20 and rod 22 to regulate the action of the electrical control circuit;

Figure 2 is a plan view of the detector device;

Figure 3 is a sectional elevation on the line 3—3 of Figure 1;

Figure 4 is an end elevation of a fixed contact plate.

In carrying the invention into effect according to one convenient mode as applied to a machine for packeting cigarettes in bundles of twenty in slide and shell packets, the cigarettes in each bundle being disposed in a plurality of rows, the detector device is mounted over a guide or runway for the bundles of cigarettes and at a position where the cigarettes in the bundle are contiguous to one another.

The detector comprises a plurality of fingers 10 which are arranged in pairs and are freely pivoted on a transverse rod 11, there being ten pairs. The fingers are in the nature of bell crank levers having a horizontally extending arm 10*a* adapted to engage the upper row of cigarettes, and a vertical arm 10*b* which carries a contact pin 12 adapted in the absence of a cigarette to engage a fixed contact pin 13 carried by a suitable bar 14. The bar 14 is provided with twenty contact pins 13 and is insulated from its mounting 18 and is provided with a terminal screw 15 for coupling the bar in an electrical circuit.

The detector fingers 10 are each provided with a spring 16, adapted to move the fingers to a position in which the contact pins 12 engage those on the bar 14.

The transverse rod 11 on which the fingers 10 pivot is carried by the frame or mounting 18 which is insulated from the machine and which is also provided with a terminal screw 19 for connection in the circuit so that the fingers form switches for closing the circuit.

Instead of insulating the mounting 18 from the machine it may be located in one path of the electrical circuit.

Located in the upper part of the framework or finger mounting 18 is a transversely arranged rock shaft 20 which carries a pair of downwardly depending arms 21 which in turn carry an adjusting rod 22 located in front of the upwardly projecting arms 10*b* of the detector fingers 10, the arrangement being such that on pivoting the rock shaft 20 the adjusting rod 22 will pivot the fingers 10 against the action of the springs 16 and raise the horizontally extending arms 10*a* of said fingers.

The oscillations of the rock shaft 20 are controlled by a rotary cam 23 through the link 24 pivoted to an arm 33 (see Fig. 1*a*) on the rock shaft in such a manner that the arms 10*a* of the fingers 10 are lifted as a bundle of cigarettes moves into the detecting position and gently lowered onto the cigarettes, the arms being again lifted before the cigarettes have moved away from the detector whereby no pressure is exerted by the fingers on the ends of the cigarettes and thus damage thereto is prevented.

It will be appreciated that if a bundle contains the correct number of cigarettes, the presence of

cigarettes will prevent any of the finger contacts 12 engaging the fixed contacts 13 so that the detector circuit will remain open. On the other hand, if the bundle is deficient in number, the appropriate finger or fingers 10 will pivot to a position such that contact is made and the circuit completed whereby an appropriate device is set for subsequent operation to eject the faulty packet.

Preferably the detector fingers 10 are arranged in pairs, one pair for each cigarette. This is for the purpose of avoiding non-detection in the event of the upper row of cigarettes (of which one or more is missing) rolling to positions resting upon two cigarettes in the lower row in which position it may be possible to prevent a full downward movement of the appropriate finger. By providing two fingers for each cigarette it is ensured that at least one finger will move to a circuit closing position.

The cigarette engaging edges 10c of the fingers may be curved complementary to the curvature of the cigarettes.

Immediately preceding the detector device a pivotally mounted flap 26 may be provided adapted to be engaged by the oncoming cigarettes to move them into endwise coincidence or alignment before they reach the detector. The pivoting flap 26 may be carried by a mounting 27 bolted to the detector framing 18.

It will be appreciated that according to the invention the detector fingers are positively controlled in contradistinction to the type of detecting means in which the oncoming cigarettes engage the fingers by their ends and lift them out of the way. Instead of a cam control, an electrical or pneumatic control may be provided.

The contacts 12 and 13 are arranged in a circuit 28 containing a solenoid 29 whereby upon the detection of a faulty bundle the solenoid is energized to set a pin or element 30 on a rotary member 31 synchronized with the motion of the bundle conveyor 32, so that the pin subsequently, when in position 30', causes the operation of known or otherwise suitable means (not shown) for ejecting the faulty packet.

Any other suitable means intermediate the detector and the faulty packet ejecting means may be provided.

I claim:

1. A machine for packing cigarettes or like shaped articles supplied in bunches each containing a plurality of rows of said articles, wherein said spaced bunches travel along a predetermined path and provision is made of detector fingers mounted above the path of the articles, and controlling means operative to raise the fingers until a bunch is in the detecting position, whereupon the fingers are lowered to engage the sides of the articles and are again raised before the articles leave the detecting position, said detector fingers being arranged in pairs, one pair for each article in a row.

2. A machine for packing cigarettes or like shaped articles supplied in bunches each containing a plurality of rows of said articles, wherein said spaced bunches travel along a predetermined path and provision is made of detector fingers mounted above the path of the articles, and controlling means operative to raise the fingers until a bunch is in the detecting position, whereupon the fingers are lowered to engage the sides of the articles and are again raised before the articles leave the detecting position, said detector fingers being arranged in pairs, one pair for each article in a row, the article engaging edges of the fingers being shaped to correspond with the curvature of an article.

3. A machine for packing cigarettes or like shaped articles supported in bunches, each containing a plurality of rows of said articles, wherein said spaced bunches travel along a predetermined path and provision is made of detector fingers mounted above the path of the articles, and controlling means operative to raise the fingers until a bunch is in the detecting position, whereupon the fingers are lowered to engage the sides of the articles, and are again raised before the articles leave the detecting position, said controlling means comprising a bar engaging the fingers and extending lengthwise of the series thereof, and means for oscillating the bar to pivot the fingers out of the article engaging position against the action of returning springs.

4. A machine for packing cigarettes or like shaped articles supported in bunches, each containing a plurality of rows of said articles, wherein said spaced bunches travel along a predetermined path and provision is made of detector fingers mounted above the path of the articles, and controlling means operative to raise the fingers until a bunch is in the detecting position, whereupon the fingers are lowered to engage the sides of the articles, and are again raised before the articles leave the detecting position, said controlling means comprising an oscillating bar engaging the fingers and extending lengthwise of the series thereof, means comprising a rotary cam for oscillating the bar, said cam being synchronised with the travel of the bundles of articles.

5. A machine for packing cigarettes or like shaped articles supplied in bunches each containing a plurality of rows of said articles, where in said spaced bunches travel along a predetermined path and provision is made of detector fingers mounted above the path of the articles, means to control said detector fingers positively, and in which a pivotally mounted flap is provided in front of the detecting position and is operative to align the ends of the articles before a bundle reaches the detecting position.

GEORGE DANIEL HORGAN.