Oct. 22, 1940. G. D. HORGAN 2,218,611

CIGARETTE DELIVERY MECHANISM

Filed Jan. 4, 1939 3 Sheets-Sheet 1

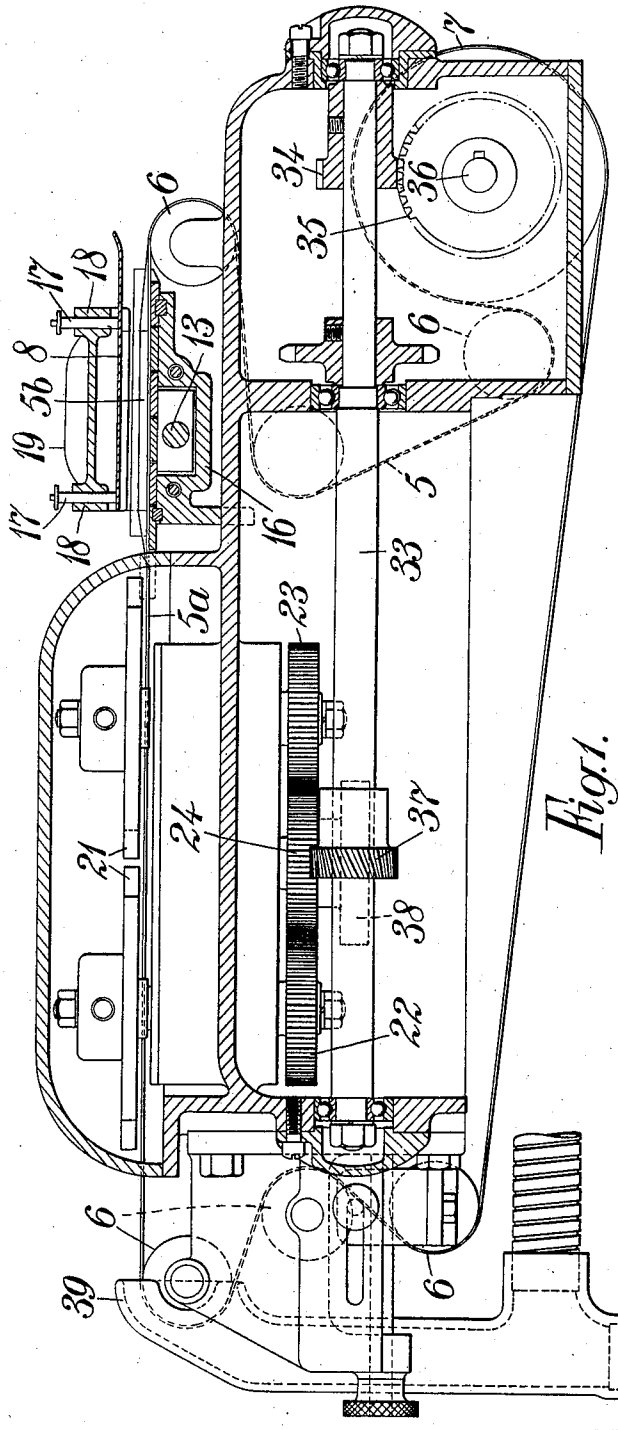


Fig. 1.

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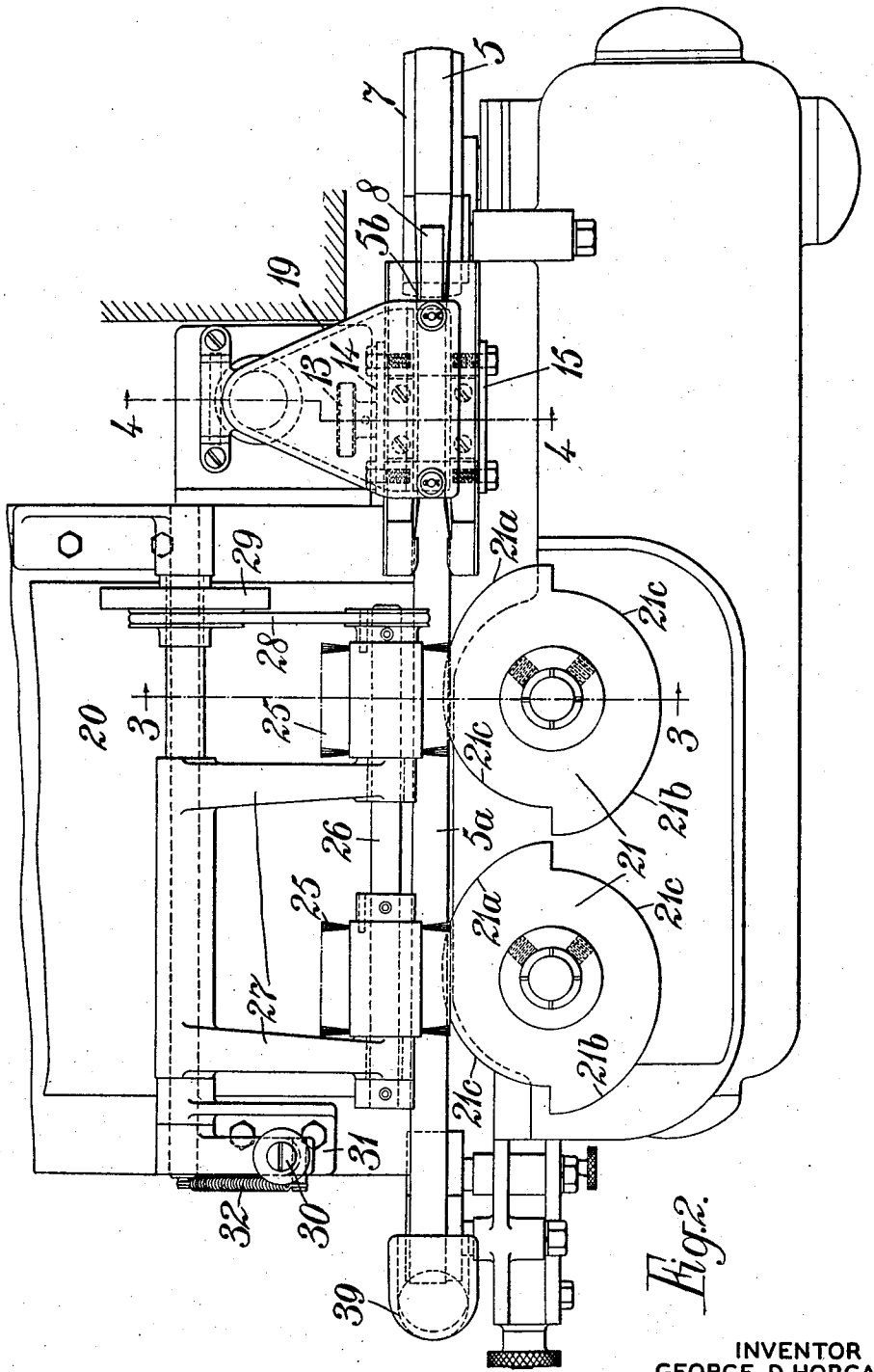


Fig. 2.

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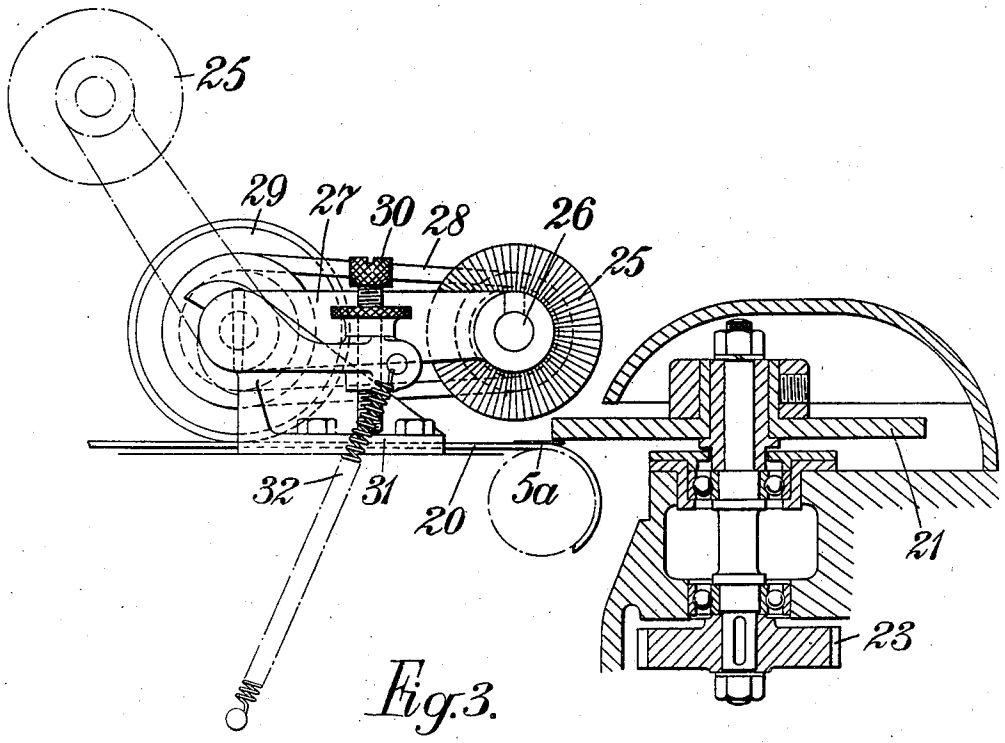


Fig. 3.

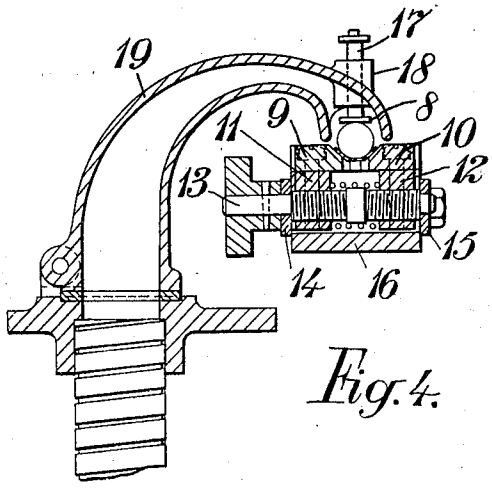


Fig. 4.

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UNITED STATES PATENT OFFICE

2,218,611

CIGARETTE DELIVERY MECHANISM

George Daniel Horgan, London, England, assignor to American Machine & Foundry Company, New York, N. Y., a corporation of New Jersey

Application January 4, 1939, Serial No. 249,233
In Great Britain January 5, 1938

2 Claims. (Cl. 198—31)

This invention relates to cigarette delivery mechanism known as cigarette catchers by which the cigarettes delivered axially from a continuous cigarette-rod making mechanism are deflected transversely of the line of delivery on to a collector band or bands upon which the cigarettes are adapted to lie in two parallel columns or rows.

It is known in cigarette catchers to provide a transversely movable deflector element comprising a bar mounted upon the crank pins of a pair of spaced crank discs so that the bar has an orbital movement and is maintained parallel to the line of delivery of the cigarettes.

With such an arrangement the cigarettes are deflected in pairs, the two leading cigarettes being transversely moved at each revolution of the crank discs. With such an arrangement the operative portion of the orbital revolution of the deflector bar occurs during a comparatively short angular displacement of the crank discs (in the neighbourhood of about 40°) so that it becomes essential to rotate the cranks at a comparatively high speed. This has the disadvantage that the deflector bar delivers a sharp blow to the cigarettes whereby damage is liable to be caused thereto.

It is an object of the present invention to provide an improved form of deflector for a cigarette catcher in which the above disadvantages are eliminated. The object is attained by arranging that the operative period of the deflector during which the cigarettes are moved is of greater duration than hitherto, whereby a correspondingly lower speed of the deflector is possible.

The invention consists in means for discharging cigarettes from a travelling conveyor on which the cigarettes lie parallel to the direction of travel, wherein the cigarettes are deflected by a surface which moves progressively across the conveyor and has a movement in the direction of travel of said conveyor.

The invention also consists in means for discharging cigarettes from a travelling conveyor on which the cigarettes lie parallel to the direction of travel, comprising a cam element rotatable in a plane parallel to the conveying surface and having a cam surface adapted to move progressively across the conveyor surface, the peripheral speed of the cam surface being approximately equal to the speed of the conveyor.

The invention further consists in means for discharging cigarettes from a travelling conveyor on which the cigarettes lie parallel to the direction of travel comprising a pair of deflecting elements rotatable in a plane parallel to the conveying surface and adapted to deflect alternate cigarettes laterally off the conveying surface by cam surfaces which progressively move across the conveying surface and also move in the direction of travel of the conveyor.

According to the invention the cigarettes as delivered from the cut-off are received upon a travelling surface which moves at a somewhat higher speed than that of the cigarette rod whereby the cigarettes are spaced out. The travelling surface feeds the cigarettes to a pair of deflector elements comprising rotary cams which transfer the cigarettes from the travelling surface on to adjacent transversely disposed collector bands. Each cam element is adapted to deflect alternate cigarettes and they are mounted independently of one another, whereby they may be independently adjusted to be in correct phase with the appropriate cigarette.

Each cam element has a pair of oppositely disposed cam surfaces which extend for about 90° so that each element deflects two cigarettes per revolution.

Further features of the invention will be hereinafter described and defined in the claims.

In the accompanying drawings:

Figure 1 is an elevation partly in section of a cigarette discharging apparatus according to the invention,

Figure 2 is a corresponding plan,

Figure 3 is a sectional elevation taken on the line 3—3 of Figure 2,

Figure 4 is a sectional elevation taken on the line 4—4 of Figure 2.

In carrying the invention into effect according to one convenient mode by way of example an endless travelling band or spacer belt **5** is provided and is supported upon guide wheels **6** and a driving pulley **7** so that an upper carrying lap **5a** is arranged in alignment with the delivery of cigarettes from the cut-off, which is not illustrated, but may desirably be disposed to the right of the belt **5**, as seen in Fig. 1. This spacer belt **5** is driven at a somewhat higher rate than the speed of delivery of the cigarettes and is adapted to receive the cigarettes and space them out. For this purpose means are provided for lightly gripping the cigarettes as they are delivered to the belt **5**. This gripping is effected by troughing the belt **5** at **5b**, providing a gravity plate **8** which is adapted to seat upon the cigarettes and lightly press them into the troughed part. The troughing of the belt **5** is effected by supporting plates **9** and **10** which are shaped to provide a groove through which the belt passes. The plates **9** and **10** are secured to blocks **11** and **12** which are laterally adjustable by the adjusting screw **13** whereby the shape of the troughing may be varied to suit the cigarettes being dealt with. The adjusting screw **13** is carried by bearing plates **14** and **15** secured to a mounting **16**. The gravity plate **8** is provided with guide pins **17** freely passing through guides **18** conveniently carried by a shorts removing nozzle **19**.

The upper conveying lap **5a** of the band extends beyond the collector band **20** and lies slightly

above the surface of such collector band, which is arranged in the usual manner transversely to the line of delivery of the cigarettes. The upper conveying lap **5***a* of the spacer belt may be supported by a platform or shelf element which is brought up as close as possible to the collector band **20** and may be cut away at one side according to the curvature of the band around its supporting roller.

Associated with the spacer band or web **5** is a pair of cigarette deflecting devices, each of which comprises a rotary cam member **21** mounted to rotate upon a vertical axis. Each cam element is provided with two oppositely disposed cam surfaces **21***a*, **21***b* which extend for about 90°, the rise of the cam being such as to extend across the spacer band a distance sufficient to ensure that the cigarette being engaged by the cam shall be pushed from the band. The intermediate parts **21***c* of the cam members are concentric with the axis thereof.

The shape and disposition of the cam surfaces **21***a*, **21***b* are such that when the cigarettes are fed by the spacer band into the deflecting zone, they are gradually pushed from the band by the cam surface.

The two cam deflecting elements **21** are spaced apart a suitable distance to conform with the final spacing of the cigarettes on the catcher band and are driven in any suitable way, for example by spur gears **22**, **23** meshing with an intermediate pinion **24**. As the cigarettes are advanced by the travelling spacer belt **5** the first cigarette is engaged by one of the cam surfaces of the first deflecting element at a point adjacent the commencement or low part of the cam surface and the cigarette is gradually pushed across the belt during its continual advance until the highest point of the cam finally moves it off the spacer belt on to the collector band. The following cigarette coincides with a part **21***c* of the first deflector cam element intermediate its two oppositely disposed cams **21***a*, **21***b* and is thus not affected by such element and so passes on to be deflected by the second cam deflector. The cam deflector elements **21** are independently adjustable on their shafts so that they may be angularly adjusted to be in correct phase with the advancing cigarettes.

The peripheral speed of the cam deflectors is approximately equal to the speed of the spacer band so that the cigarettes and appropriate cam surface advance at approximately the same rate.

According to the preferred arrangement rotary brushes **25** are provided which in addition to preventing rolling of the cigarettes aid in maintaining the cigarettes parallel with the spacer band while under the influence of the cams.

The brushes **25** are mounted upon a spindle **26** carried in a pivotal mounting **27**. The spindle **26** is driven by a belt **28** from a roller **29** in frictional contact with the collector band **20**. The spacing of the brushes **25** from the collector band is adjustable by a screw stop **30** which engages a mounting **31** and is held down thereon by a spring **32**. The brushes may be pivoted to an inoperative position in which they are retained by the spring **32**. The mounting for the brushes is secured to the collector band support. The preference for such rotary brushes as a means for preventing rolling of the cigarettes and for maintaining the cigarettes parallel with the spacer band while under the influence of the cams is not intended to exclude the use of other forms of devices of ancillary character, such as a resilient roller of known or otherwise suitable type of that purpose, and hanging retarding curtains or the like.

The drive for the spacer belt **5** and the cam deflectors **21** is taken from a shaft **33** driven from any suitable part. This shaft carries a gear **34** which drives a gear **35** on the spindle **36** of the belt drum **7**. A second gear **37** on the shaft **33** drives a gear **38** which is secured to a vertical spindle which drives the intermediate pinion **24** by which the cam gears **22**, **23** are driven.

A nozzle **39** is provided for removing shorts from the spacer belt **5** at its forward end. This nozzle **39** and the nozzle **19** are connected to a suitable source of suction.

It will be appreciated that as the cam portions of each cam deflector each occupies an arc substantially 90° the speed of the elements will be considerably lower than in the known apparatus whilst the objectionable feature of impacting on the cigarette is avoided.

Moreover by the arrangement of the spacer band over the collector band as described above there will be practically no drop of the cigarettes as they are deflected on to the collector bands.

I claim:

1. Apparatus for discharging cigarettes comprising a traveling conveyor on which the cigarettes lie parallel to the direction of travel; a pair of deflector elements rotatable in a plane parallel to the conveyor and each arranged to deflect alternate cigarettes from the conveyor in a lateral direction, said elements having deflecting cam surfaces, means for rotating said elements so that the deflecting cam surfaces progressively move across the conveyor and in the direction of travel at a speed approximating to that of the conveyor; a collector band located to receive the deflected cigarettes; rotary brushes located in the discharging zones and rotatable about axes parallel to the direction of travel of the conveyor, means to support said brushes in floating adjusted position for engaging the cigarettes as they are moved across the conveyor by the deflectors, and means to bias said brushes toward an adjustable limit relatively to the path of movement of the deflected cigarettes.

2. Apparatus for discharging cigarettes comprising a traveling conveyor on which the cigarettes lie parallel to the direction of travel; a pair of deflector elements rotatable in a plane parallel to the conveyor and each arranged to deflect alternate cigarettes from the conveyor in a lateral direction, said elements having deflecting cam surfaces, means for rotating said elements so that the deflecting cam surfaces progressively move across the conveyor and in the direction of travel at a speed approximating to that of the conveyor, a collector band located to receive the deflected cigarettes, brushes located in the discharging zones to rotate about axes parallel to the direction of travel of the conveyor, and friction driving means engaging the collector band and driving said brushes, said brushes engaging the cigarettes as they are moved across the conveyor by the deflectors.

GEORGE DANIEL HORGAN.