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1,668,693

W. E. MOLINS

FEEDING APPARATUS FOR CIGARETTES AND LIKE ARTICLES

Filed Sept. 9, 1926

2 Sheets-Sheet 1

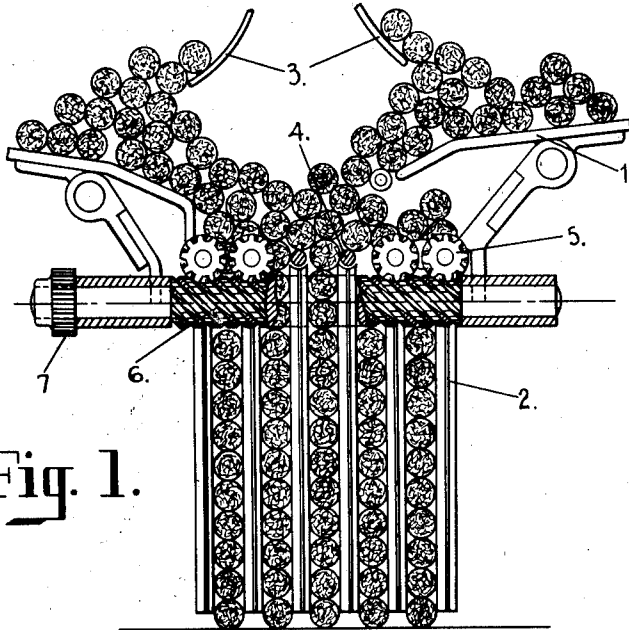


Fig. 1.

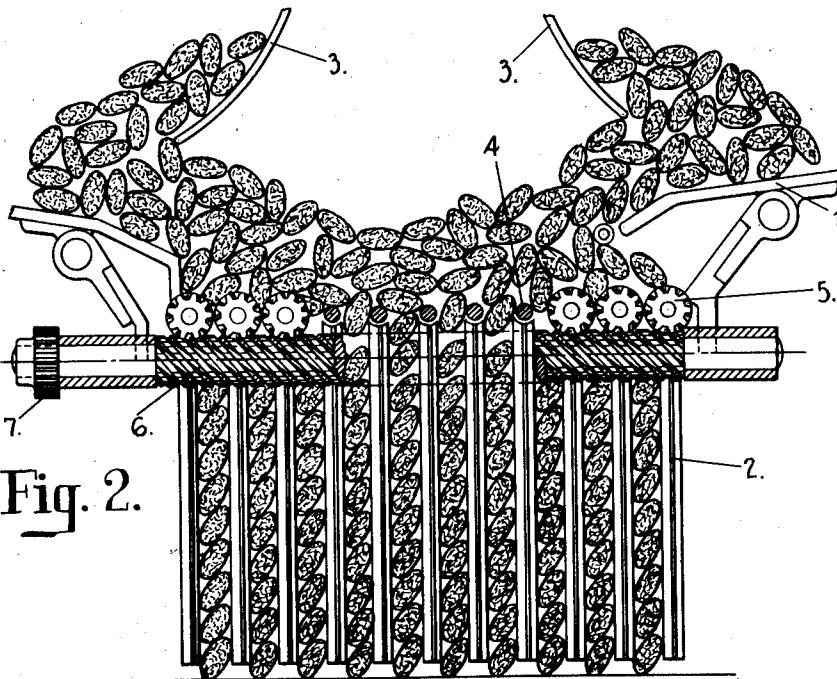


Fig. 2.

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Fig. 6.

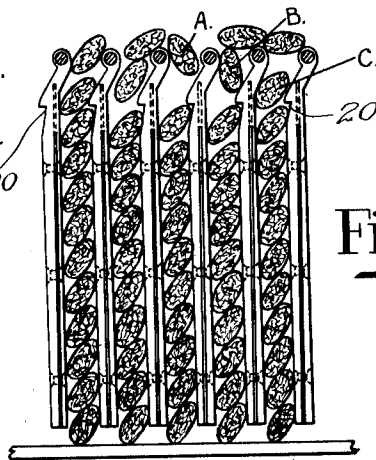
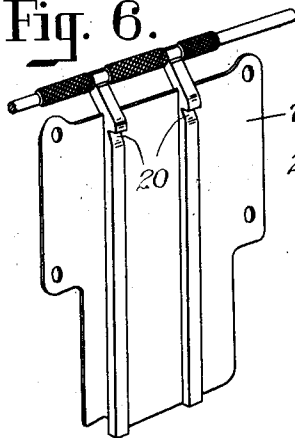


Fig. 3.

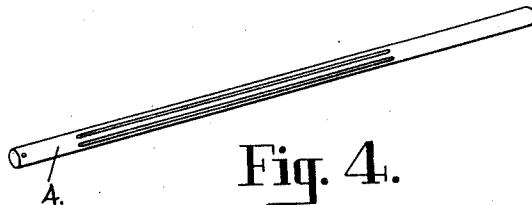


Fig. 4.

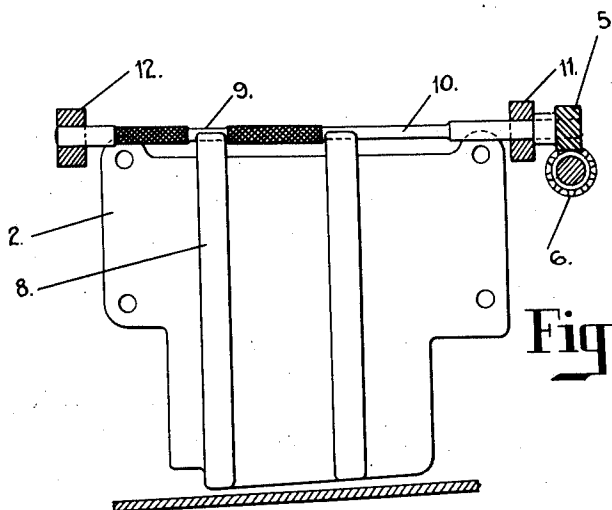


Fig. 5.

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UNITED STATES PATENT OFFICE.

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FEEDING APPARATUS FOR CIGARETTES AND LIKE ARTICLES.

Application filed September 9, 1926, Serial No. 134,563, and in Great Britain September 22, 1925.

This invention is for improvements in or relating to an apparatus for feeding cigarettes and like articles, and more particularly to a cigarette feeding apparatus of the type wherein cigarettes, located in a hopper, are automatically fed between a series of vertically disposed vanes adapted to arrange the cigarettes in superimposed rows comprising a predetermined number of cigarettes in each row.

It is an object of the present invention to provide in a cigarette feeding apparatus of the type referred to, means which will eliminate the possibility of cigarettes becoming jammed in the mouth of the vanes, and thereby interrupting the continuous feed of the apparatus.

A further object of the present invention is to provide a cigarette feeding apparatus of the type referred to, wherein oval cigarettes may be fed from the hopper to the channels formed between the vanes, in such a manner that the longer axes of the various cigarettes are all located in the same direction.

The present invention consists of a cigarette feeding apparatus of the type referred to which comprises means (for example a pair of rotatable rollers) adapted to ensure that one cigarette at a time is fed between a pair of vanes and prevent two or more cigarettes becoming jammed in the mouth of said vanes.

Further the present invention consists of a cigarette feeding apparatus of the type referred to wherein means, operatively connected to the vanes or formed integral therewith, are adapted to arrange oval cigarettes in the channels formed between the vanes, in such a manner that the longer axes thereof are located in a constant direction.

The invention is more particularly described with reference to the accompanying drawings, in which:—

Fig. 1 illustrates a device constructed according to the present invention.

Fig. 2 illustrates the device shown in Fig. 1 when modified to accommodate oval cigarettes.

Fig. 3 illustrates a modified construction of the device illustrated in Figs. 1 and 2.

Fig. 4 is a perspective view of a fluted roller adapted to be rotatably mounted at the top of each vane in the manner illustrated in Figs. 1, 2, 3 and 5.

Fig. 5 is a detailed side view of one of the

vanes showing the fluted roller mounted in position thereon, and

Fig. 6 illustrates a detailed construction of vane constructed according to the present invention.

One method of carrying the invention into effect will hereinafter be more particularly described with reference to the cigarette packing machine described in my British patents specification Nos. 216,326 and 238,355. In the machines described in the said specifications, cigarettes are fed from the delivery end of a hopper into the mouths of a series of vanes, and the vanes are automatically vibrated so as to facilitate the movement of the cigarettes in the channels formed between the vanes. The cigarettes are arranged to fall under gravity into the path of an endless conveyor which is adapted to convey the cigarettes through packing mechanism which encloses the cigarettes in an outer packet or wrapper.

Referring to Figs. 1 and 2 of the drawings, there is illustrated a number of cigarettes supported upon the base-plate 1 of a hopper constructed according to my British Patent No. 216,326. The base 1 of the hopper is continuously vibrated in order to ensure that cigarettes are fed from the main part of the hopper into the smaller compartment formed above the vane plates 2 by the oscillating baffle plates 3.

Mounted at the upper end of each vane plate 2 is a fluted roller 4, which is adapted to extend along the upper edge of each vane. Each roller 4 has secured to the free end thereof a wormwheel 5 which is adapted to mesh with a worm 6 driven by a pinion 7 from the main drive of the machine.

The fluted rollers 4 are adapted to rotate in bearings 11 and 12 mounted at either end of the vane plates 2. Secured on either side of the vane plates 2 are strips 8, the upper ends of which are adapted to shroud reduced portions 9 and 10 of the roller 4 so as to prevent the cigarettes jamming or locking between the strips 8 of one vane and the roller of the adjacent vane. The thickness of the strips 8 plus the thickness of a vane plate 2 is arranged to be equivalent to the diameter of a fluted roller 4, so that the outer surface 8 of the strips are tangential to the fluted portion of the rollers 4.

When the apparatus is required to feed cork tipped cigarettes, the end of the fluted roller 4 adjacent to the worm wheel 5 is

provided with an extended reduced portion 10, adapted to permit the cork tipped portion of the cigarettes to pass between the rollers without engaging with the surfaces thereof, as it has been found in practice that due to the difference between the co-efficients of friction of paper and cork, cork tipped cigarettes are liable to be crossed or dislodged if the tipped portion of the same is allowed to contact with the fluted surface of the rollers.

Due to the fact that the adjacent portions of a pair of fluted rollers mounted upon a pair of adjacent vanes are moving in opposite directions the tendency of one roller is to remove cigarettes from the mouth of the vanes and the other roller to draw cigarettes between the vanes. This action of an adjacent pair of rollers obviates two cigarettes becoming jammed in the mouth of a pair of vanes and consequently ensures the continuous feed of cigarettes through the channels formed between a pair of vanes.

Further in the case of oval cigarettes, there is a tendency for cigarettes to become lodged in the mouth of a pair of vanes with their minor axes located in the direction of the channel formed between a pair of vanes, and the action of the rotating rollers hereinbefore referred to, prevents the cigarettes resting in the mouth of the vanes as one of the rollers tends to draw the cigarettes from one side into the vanes, and the other roller tends to carry a cigarette from the other side into the mouth of the next pair of vanes. Further as the rollers which tend to draw the cigarettes into the channels between pairs of vanes are located on corresponding sides of the said channels, the tendency of these rollers is to locate oval cigarettes with their longer axes located in corresponding directions.

It has been found, however, that in order to positively ensure that each oval cigarette is arranged in the channel between a pair of vanes with its longer axes located in a predetermined direction, the vanes are preferably shaped in the manner indicated in Fig. 3, wherein the mouth of each pair of vanes is inclined to the subsequent channel formed between the vanes. By arranging the mouth of each pair of vanes so that it is inclined to the subsequent channel formed between the vanes each oval cigarette which is fed into the mouth of the vanes is positively guided into a position wherein its longer axis is located in a direction which corresponds to the inclination of the mouth of the vanes. The effect of the inclined mouth of each pair of vanes upon a cigarette is clearly demonstrated in three stages by the positions of the cigarettes A, B and C, shown in Fig. 3.

Further each vane is provided at the junction between its two inclined sections with a

recessed portion 20 which is formed on that side of the vertical section which faces in the direction of movement of the cigarettes as they move down the inclined mouth of the vanes. The recessed portion 20 ensures that the trailing end of the longer axis of each oval cigarette drops into the said recess and locates each cigarette correctly with reference to preceding one.

The inclined mouth and recessed portion 20 of each vane is preferably formed by the strips 8, as is clearly illustrated in Figs. 3 and 6, but it will be appreciated that the vanes 2 could be suitably shaped into the desired configuration so as to constitute the guiding elements for the cigarettes. It is to be clearly understood that in the foregoing claims the term "vanes" includes a shaped vane or a composite vane built up of shaped strips and a plain dividing plate as is illustrated in the accompanying drawings.

The rotating fluted rollers hereinbefore referred to act as lips on the mouth of the vanes and ensure that the cigarettes are drawn into the mouths of the vanes one at a time, the inclination of the mouth of the vane ensuring that each oval cigarette is automatically swung into its correct position before it engages with the preceding cigarette located between a pair of vanes.

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

1. A cigarette feeding apparatus which comprises a hopper adapted to accommodate cigarettes, a series of vanes located beneath the delivery end of said hopper and a pair of rotatable rollers mounted one on either side of the mouth of the channel formed between each pair of vanes.

2. A cigarette feeding apparatus which comprises in combination a hopper adapted to accommodate cigarettes, parallel vanes located beneath the delivery end of said hopper, a pair of rotatable rollers mounted upon the upper edges of each pair of vanes so as to constitute the lips of the mouth of the channel formed between each pair of vanes.

3. In a cigarette feeding apparatus, in combination, a hopper adapted to accommodate cigarettes, a series of spaced, parallel vanes located beneath the delivery end of said hopper and a roller mounted adjacent and parallel to the upper edge of each vane.

4. In a cigarette feeding apparatus, in combination, a hopper adapted to accommodate cigarettes, a series of spaced, parallel vanes located beneath the delivery end of said hopper and a serrated roller mounted adjacent and parallel to the upper edge of each vane.

5. In a cigarette feeding apparatus, in combination, a hopper adapted to accommodate cigarettes, a series of spaced, parallel vanes located beneath the delivery end

of said hopper, a roller mounted adjacent and parallel to the upper edge of each vane and strips extending along the faces of said vanes in the direction of movement of cigarettes between them and partially shrouding said rollers.

6. In a cigarette feeding apparatus, in combination, a hopper adapted to accommodate cigarettes, a series of spaced, parallel vanes located beneath the delivery end of said hopper, a roller mounted adjacent and parallel to the upper edge of each vane and strips extending along the faces of said vanes in the direction of movement of cigarettes between them, said strips extending above the upper edges of said vanes and having the extending portions inclined to the planes of the vanes.

7. A cigarette feeding apparatus which comprises in combination a hopper adapted to accommodate cigarettes, and vanes located beneath the delivery end of said hopper, the mouth of the channel between each pair of vanes being inclined to the subsequent channel separating the vanes in such a manner that oval cigarettes fed into the mouth of the said channel are automatically arranged with the longer axes thereof located in a substantially constant direction.

8. A cigarette feeding apparatus which comprises in combination a hopper adapted to accommodate cigarettes, vanes located beneath the delivery end of said hopper, rotatable rollers disposed between the delivery end of the hopper and the mouth formed between each pair of vanes arranged to turn

oval cigarettes about their axes and deliver them one at a time into the mouth of each pair of vanes, said mouth being inclined to the subsequent channel separating the vanes in such a manner that the cigarettes are automatically arranged in the channel with the longer axes thereof located in a substantially constant direction.

9. A cigarette feeding apparatus which comprises in combination a hopper adapted to accommodate cigarettes, a pair of vanes located beneath the delivery end of said hopper, means forming a mouth between the pair of vanes inclined to the subsequent channel separating the vanes and the face of one vane being recessed at the junction between the mouth of the vanes and the subsequent channel so as to receive the trailing end of the longer axis of an oval cigarette.

10. A cigarette feeding apparatus which comprises in combination a hopper adapted to accommodate cigarettes, a pair of spaced vanes located beneath the delivery end of said hopper having a pair of continuously rotating fluted rollers mounted at the mouth of the channel formed between the vanes, the mouth of each channel being inclined to the subsequent channel separating the vanes and the face of the vane facing in the direction of movement of a cigarette in said mouth being recessed at the junction between the mouth of the vanes and the subsequent channel.

In testimony whereof I hereunto affix my signature.

WALTER EVERETT MOLINS.