J. N. TZIBIDES.

APPARATUS FOR HANDLING CIGARETTES AND SIMILAR ARTICLES.

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1,236,019. Patented Aug. 7, 1917.

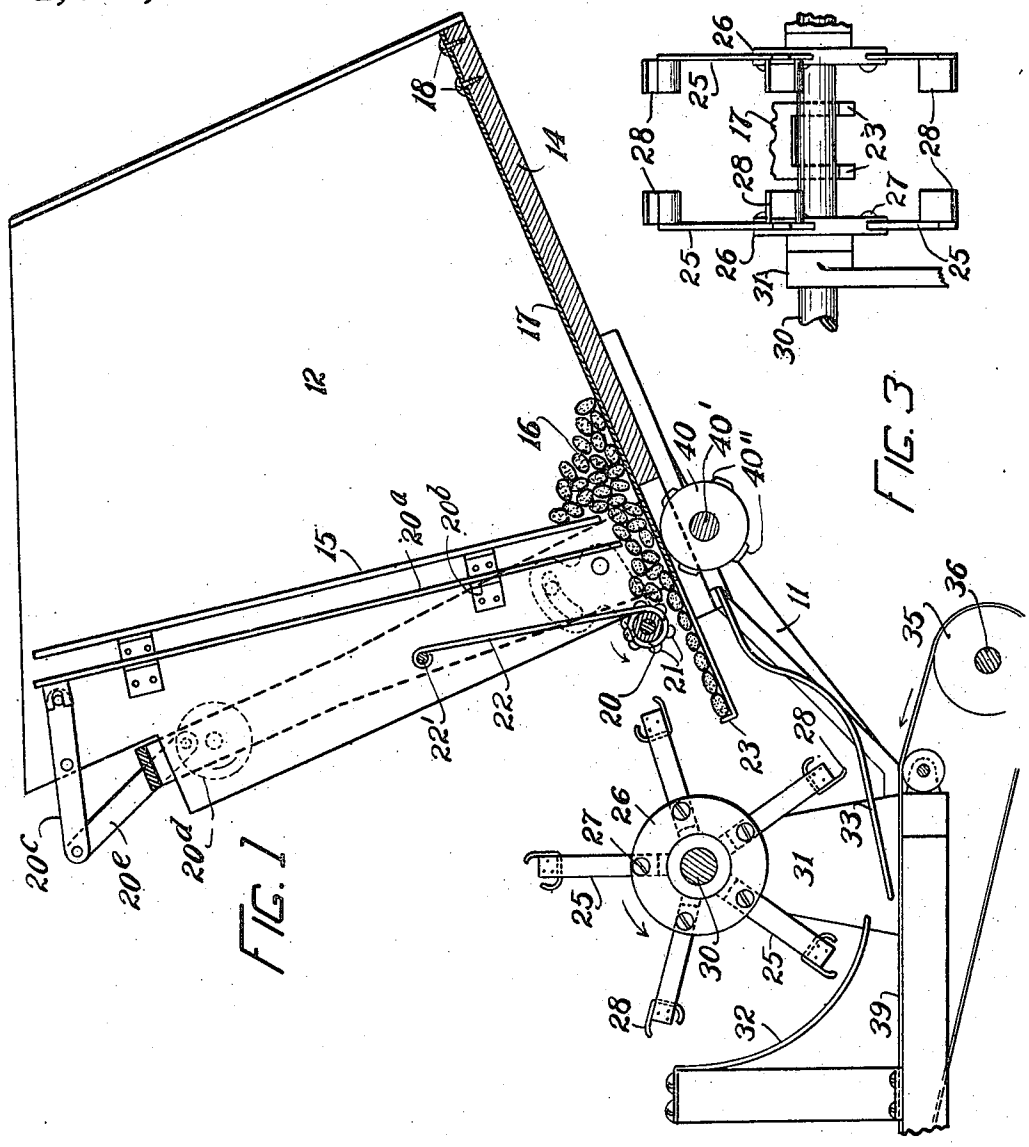


FIG. 1

FIG. 3

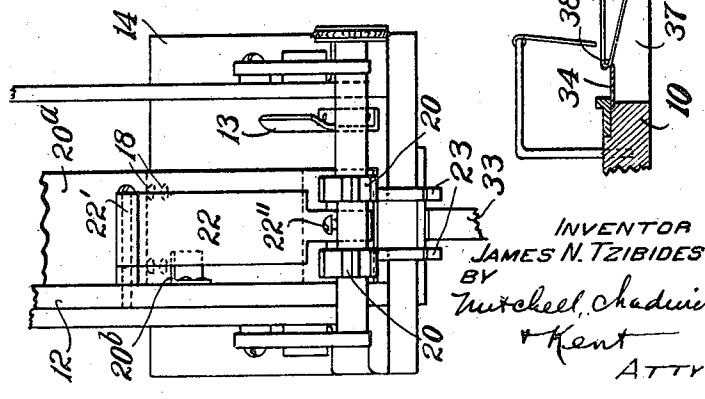


FIG. 2

WITNESSES

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APPARATUS FOR HANDLING CIGARETTES AND SIMILAR ARTICLES.

1,236,019. Specification of Letters Patent. Patented Aug. 7, 1917.

Application filed June 27, 1914. Serial No. 847,729.

To all whom it may concern:

Be it known that I, JAMES N. TZIBIDES, a subject of the King of Greece, residing at Beachmont, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Apparatus for Handling Cigarettes and Similar Articles, of which the following is a specification.

This invention relates to improvements in apparatus for handling cigarettes and similar articles. More particularly it relates to apparatus for taking cigarettes from a quantity in a magazine and arranging them singly, end to end, longitudinally on a conveyer belt. Although the invention is not limited in its scope merely to the handling of cigarettes, and may be applied to other articles and in other connections from that shown herein, it has been devised primarily, and is here represented as it may be arranged, as an auxiliary to apparatus shown in the Letters Patent No. 890,734, granted to me June 16, 1908, or to that shown in an application for patent on a machine for applying cork tips to cigarettes copending herewith, Serial No. 847,728, the purpose of the present apparatus being to charge or load automatically the conveyer belt 34 of the apparatus shown in my said patent.

One form of apparatus embodying the invention, by which the foregoing objects are accomplished, is shown in the accompanying drawings in which:

Figure 1 is an elevation showing a side view of the hopper in section on a plane through the center of the part 22 of Fig. 2;

Fig. 2 is an elevation showing a fragment of the front of the hopper, being that side of the hopper which is toward the left in Fig. 1; and

Fig. 3 is a view of the distributing wheel and associated parts from the same direction.

In the drawings the supporting and power driving connections are mostly omitted for the sake of clearness. The table 10 has brackets 11 which support a hopper comprised of two side plates, 12 and 13, the latter being removable, an inclined under plate 14 and abutment plate 15. The cigarettes 16 rest on auxiliary plate 17, preferably flexible, held at the rear end by screws 18 or other suitable means upon the under plate 14, but otherwise resting loosely upon it. Under the lower end of plate 15 is a space over plate 17 for passage of cigarettes 16. A device to prevent the choking of the cigarettes, as they pass plate 15, consists in part of a rotating wheel 20 upon which are a series of projections 21, adapted to engage such cigarettes upon plate 17 as are in its path and push backward all but those which can pass under it by sliding on their flat sides on the plate 17. This stirs and tends to break any jam of cigarettes which might interfere with the regularity of feed. To this effect a swinging tongue 22 coöperates, being pivoted at 22′, and periodically pushed toward the right in Fig. 1 when engaged by screw head 22″ rotating on the shaft that carries wheel 20. As best seen in Fig. 2, this wheel 20 is preferably arranged in duplicate, so that both ends of a cigarette are engaged simultaneously, and the tongue 22 swings between, in the middle. An upturned lip 23 on the forward end of plate 17 holds those few cigarettes which are outside of the place where the wheel 20 acts until they are picked up by the distributer. Any arch of cigarettes which may form between the front barrier thus formed by the parts 20, 21 and 22, and the abutment plate 15, is broken down by the periodic action of a downward thrusting plate 20^a which slides on ways 20^b as the lever 20^c is oscillated by a suitably driven crank 20^d and connecting rod 20^e. The distributer comprises a double series of radial arms 25 held adjustably in two disks 26 by screws 27, the disks being fast side by side upon shaft 30 which rotates in bearings 31 over table 10. Arms 25 are each provided with pockets 28 at their extremities, and are arranged in pairs, they and their disks being separated from each other sufficiently to clear plate 17 and yet pick up the ends of the foremost cigarette, plate 17 being narrower than the length of the cigarettes. Each pair of arms 25 carries its cigarette thus picked up, until its pockets are inverted and the cigarette drops out by gravity. A rearward-inclined guide or chute 32 is provided to receive it. The cigarette slides backward and downward on this, and is delivered by it to a forward-inclined guide or chute 33, on which it slides forward and downward, passing under the end of guide 32 to the feeding belt 39. Belt 39 is carried on wheel 35, which is rotatable on shaft 36. The belt which is endless, moves through a recess 37 in the table 10 to and about a smaller roller, 38, which is placed adjacent to the edge of a feeding belt 34 running

transversely with respect to belt 39. Cigarettes lying transversely on belt 39 therefore lie longitudinally of belt 34, end to end in single file, when deposited thereon. The belt 34 corresponds to feed belt "34" in my Patent No. 890,734, dated June 16, 1908; and the table 10 corresponds to table "31" therein. Any suitable gearing connections may be provided so that the frequency with which the pockets 28 deposit cigarettes on belt 39 bears a definite and constant ratio to the speed of belt 34; and this should be adjusted so that the cigarettes on belt 39 will lie at such distances apart that the leading one will not arrive at and be transferred to belt 34 until that next in advance of it has been carried out of line by belt 34.

In the operation of the apparatus, the front barrier 15 is to be set with the opening under it high enough so that cigarettes will pass under freely by action of gravity, as the removal of those in front makes room. The inclination of the bottom 17 is such that all cigarettes which escape will tend to slide down to the lip 23 at the end of the bottom, and this effect is made certain by a recurrent agitation of the cigarettes produced by a rotating wheel 40 on shaft 40′ provided with projecting knobs 40″ which lift and drop the bottom 17. The low location of wheel 20 makes it impossible for more than a single layer to pass to the lip 23. The constantly recurring movement of the projections 21 pushes back those that cannot pass under and keeps them all straight in the transverse direction.

It is desirable that the wheel 20 be so located that several individual cigarettes will always be below and beyond it. This can be provided for in the construction, according to the size of the cigarettes or other articles on which the apparatus is to operate. The arms 25, carrying the pockets 28, are adjustable radially from or toward the shaft 30, and this adjustment should be made in coördination with the position of lip 23, so that the fingers will lap the end of the bottom support 17 far enough to engage and lift the foremost cigarette or other article, but not far enough to interfere with the second cigarette.

The pockets 28 are preferably in the form of open-topped receptacles inclosed on three sides, in which, as clearly seen in Fig. 1, the side in advance is shorter than the side at the rear. This enables the advance side to clear the leading cigarette which lies behind lip 23 while the rear side engages and lifts it. As the revolution of the wheel progresses, the cigarette slips loosely around within the pocket from its rear to that portion which is nearest the center, and then to that which is forward, and, when the revolution has progressed so far that that finger points downward, and no longer supports it, it finally drops out. The invention further comprises means to transfer the cigarettes from the pockets to the belt 39 gently, regularly and with accuracy of position. The guide 32 is so arranged, curved and inclined that the cigarette, when it gets to the place where it is to drop, is close above this guide 32. The cigarette then slides down the incline to guide 33, and thence down to belt 39. If it should fail to slide freely the rear walls of the pockets 28 will push it gently. At the end of the incline 32 the cigarettes drop out of reach of the parts 28. The guide 33 assists in the regularity of spacing of cigarettes on belt 39 because the one that is moving more rapidly and so would tend to arrive on belt 39 closer to the one ahead of it, is thrown farther upon the guide 33 and has to slide back farther upon its gentle inclination than one which drops more nearly in a vertical direction from the end of guide 32, so that they arrive on belt 39 at fairly regular intervals. These guides are of especial service when the apparatus is working rapidly, at which time the individual cigarettes are thrown with some violence from the pockets 28. The guide 32 extends from about the level of the axis of the distributing wheel; and the guide 33 sloping in the opposite direction, terminates far enough below it to allow cigarettes to pass freely under the end of guide 32 to or on the belt 39. The belt 34 travels at a relatively high speed, so that as soon as a cigarette is deposited thereon it is whisked away, and a fresh part of belt 34 is quickly ready to receive the next cigarette, even though it may have lain on belt 39 close to its predecessor. The cigarettes being thus assembled on belt 34 remain thereon ready for delivery by it, in single file longitudinally, as fast as needed. While their progress is blocked the belt 34 slips idly under them; but whenever no obstacle exists a cigarette is carried onward on the belt till an obstacle is met, or till it is discharged from it by any means that may be provided. Consequently the machinery should be speeded so that the rate of taking individuals at the point 23 will equal the rate they are needed to be delivered by belt 34. Any irregularities in the time of passage of individuals through the apparatus to that belt will be equalized by the fact that a few always remain assembled on that belt.

I claim:—

1. In combination, an agitated support for a row of articles, arranged so that articles tend to move in one direction thereon; means continuously open to the passage of a single layer of articles thereon and preventing the movement past itself of more than said single layer; a stop for said articles continuously barring the advance of

said single row of articles; and a revoluble wheel having a pocket whose travel laps the end of the support and thereby lifts the leading article from the row.

2. In combination, means for forming articles in a row and moving them in the direction of the row; means preventing the passage of more than a single row and limiting the travel of the leading article in said direction; means having an uncovered pocket adapted to hold a single article loosely, by gravity, and moving upward through the position of the end article in the row; thereby removing the end article, said pocket having a rear wall adapted to engage the article, and an advance side adapted to hold it when engaged till inversion of the pocket; and means to invert the pocket whereby the article falls out.

3. In combination, a support for a row of articles; a stationarily positioned stop thereon; means whereby articles are formed into a row of single depth and tend to move to the stop; and open-topped lifting means, moving upward periodically past the stop, lapping the end of the row and thereby removing the article that is at the stop.

4. In combination, a support for a row of articles; means whereby articles in the row tend to move to a predeterminate position; a revoluble wheel having a pocket adapted to remove the article occupying said position, carry it over its axis and discharge it; there being an inclined plate below the point of discharge, adapted to guide the discharged article; a second plate adapted to receive articles projected by the incline of the first plate and inclined in an opposite direction, and a conveyer belt continuously moving in one direction under the end of the second inclined plate, the said inclines being arranged and adapted to standardize the spacing of the articles as they are deposited on the belt.

5. In combination, a support for a row of articles; means whereby articles in the row tend to move to a predeterminate position; a revoluble wheel having a pocket adapted to remove the article occupying said position, carry it over its axis and discharge it; there being a guide plate below the point of discharge, curved along and close enough to the path of the further downward movement of the pocket after the discharge for the pocket to engage and push along any article remaining on said guide plate.

6. In combination, a support for a row of articles; means whereby articles in the row tend to move to a predeterminate position; a revoluble wheel having a pocket adapted to remove the article occupying said position, carry it over its axis and discharge it; there being a guide plate below the point of discharge, curved along and close to the path of the further downward movement of the pocket after the discharge; the terminal part of the guide plate being at a gentle incline, and there being under its end a free space to receive the article falling therefrom, and beyond and below its end a guide plate inclined in the opposite direction adapted to receive and discharge by gravity to said free space any articles discharged with considerable speed from the first mentioned guide plate, the said free space affording opportunity for articles to drop vertically from the end of said gentle incline past said guide plate which is opposite the incline.

7. The combination of a holder, including a bottom on which a quantity of articles may rest, and a barrier restraining forward movement of contents of the holder, except close to the bottom, there being no barrier to the passage of a single row close to the bottom; an extension bottom beyond the barrier, whereon articles which have passed the barrier may lie, having a stop; means shaking the articles past the barrier and to the stop in single row; and means acting repeatedly at intervals to remove the single article which is at the stop.

8. The combination of a holder, including a bottom on which a quantity of articles may rest, and a barrier restraining forward movement of contents of the holder, except close to the bottom; an extension bottom beyond the barrier, whereon articles which have passed the barrier may lie, having a stop; means shaking the articles past the barrier and to the stop in single row; means acting repeatedly at intervals to remove the single article which is at the stop; and a second barrier, between the first barrier and the stop, permitting the free passage of a single row of articles on said bottom, and pushing backward repeatedly articles that are above the level of said single row.

9. The combination of a holder, including a bottom on which a quantity of articles may rest, and a barrier restraining forward movement of contents of the holder, except close to the bottom; an extension bottom beyond the barrier, whereon articles which have passed the barrier may lie, having a stop; means shaking the articles past the barrier and to the stop in single row; means acting repeatedly at intervals to remove the single article which is at the stop; a toothed roll arranged and rotating between said barrier and said stop, with room for only a single row of articles to pass it on said bottom, articles above the height of said single row being repeatedly pushed backward by its teeth.

10. The combination of a holder, including a bottom on which a quantity of articles may rest, and a barrier restraining forward movement of contents of the holder, except close to the bottom; an extension bottom be-

yond the barrier, whereon articles which have passed the barrier may lie, having a stop; means shaking the articles past the barrier and to the stop in single row; means acting repeatedly at intervals to remove the single article which is at the stop; a toothed roll arranged and rotating between said barrier and said stop, with room for only a single row of articles to pass it on said bottom, articles above the height of said single row being repeatedly pushed backward by its teeth; a movable element between said roll and said barrier adapted to engage articles standing above said single row, and means for swinging it backward from the roll pushing the articles back therefrom.

11. The combination of a holder, including a bottom on which a quantity of articles may rest, and a barrier restraining forward movement of contents of the holder, except close to the bottom; an extension bottom beyond the barrier, whereon articles which have passed the barrier may lie, having a stop; means shaking the articles past the barrier and to the stop in single row; means acting repeatedly at intervals to remove the single article which is at the stop; a toothed roll arranged and rotating between said barrier and said stop, with room for only a single row of articles to pass it on said bottom, articles above the height of said single row being repeatedly pushed backward by its teeth; and a member between the said barrier and said roll oscillating up and down transversely to the general direction of movement of the articles, thereby breaking down any arches that may form.

12. The combination of a holder, including a bottom on which a quantity of articles may rest, and a barrier restraining forward movement of contents of the holder, except close to the bottom; an extension bottom beyond the barrier, whereon articles which have passed the barrier may lie, having a stop; means shaking the articles past the barrier and to the stop in single row; means acting repeatedly at intervals to remove the single article which is at the stop; a toothed roll arranged and rotating between said barrier and said stop, with room for only a single row of articles to pass it on said bottom, articles above the height of said single row being repeatedly pushed backward by its teeth; and elements, located between said roll and barrier, oscillating respectively transversely and longitudinally of the direction of movement of articles.

13. The combination of a holder for a quantity of articles having an inclined bottom and a front barrier adapted to permit the escape of a few articles at any time down the incline; means for agitating the bottom; a rotary secondary barrier permitting the passage of only a single row of articles, and agitators directly acting upon the articles that are between the two barriers and above the bottom row.

14. Feeding mechanism for rod-form articles comprising a conveyer belt adapted to receive and convey said articles with the said articles lying end to end upon it; a holder for a quantity of said articles adapted to contain them lying side to side upon and beside each other; means to shake the said articles into a row in the holder, in which row the articles lie side by side; and means to transfer them one by one periodically from the said row to the said conveyer belt, whereby their arrangement is changed from a side to side arrangement in the holder into an end to end arrangement on the conveyer belt.

Signed by me at Boston, Mass., this 25th day of June, 1914.

JAMES M. TZIBIDES.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."