M. C. GRAHL.

ARRANGEMENT FOR FLATTENING CIGARETTES OR CIGARETTE TUBES.

APPLICATION FILED JULY 31, 1914.

1,184,444.

Patented May 23, 1916.

4 SHEETS—SHEET 1.

Fig. 1.

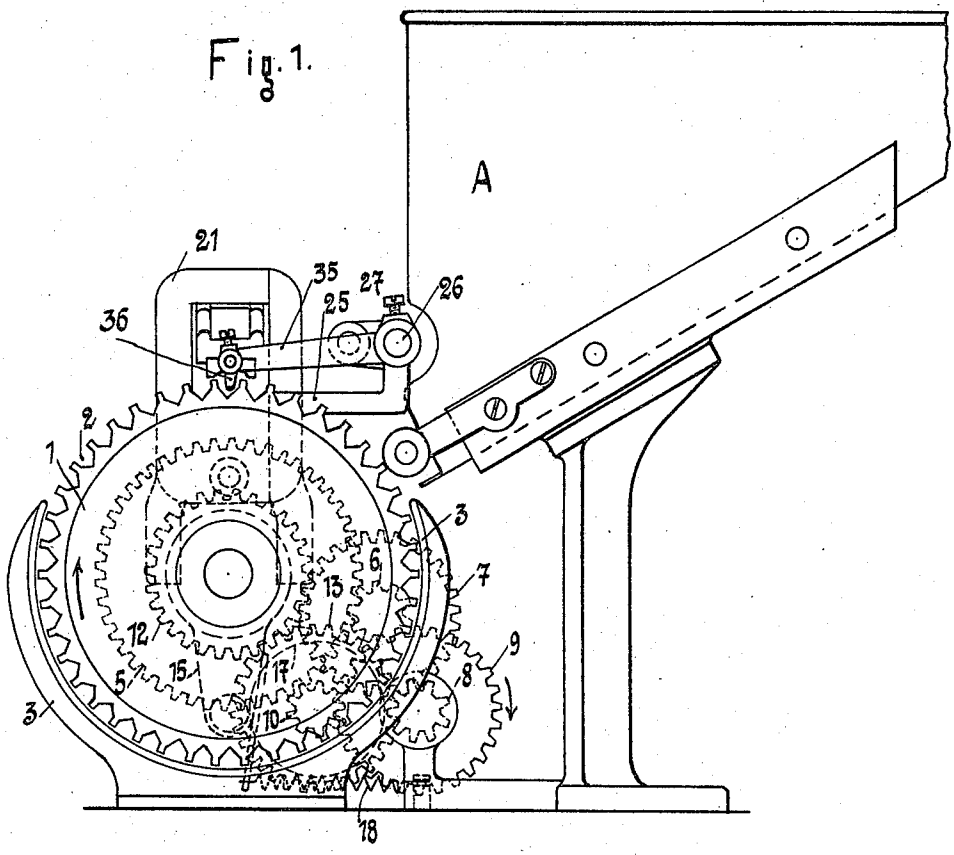
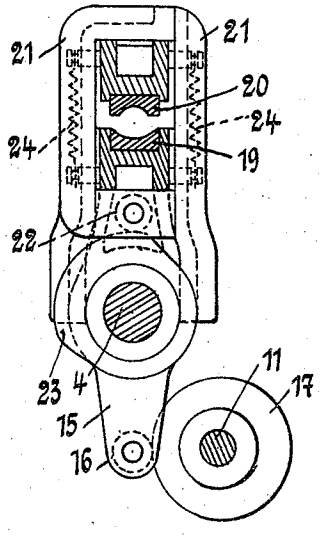


Fig. 4.



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Jos. Bebans.

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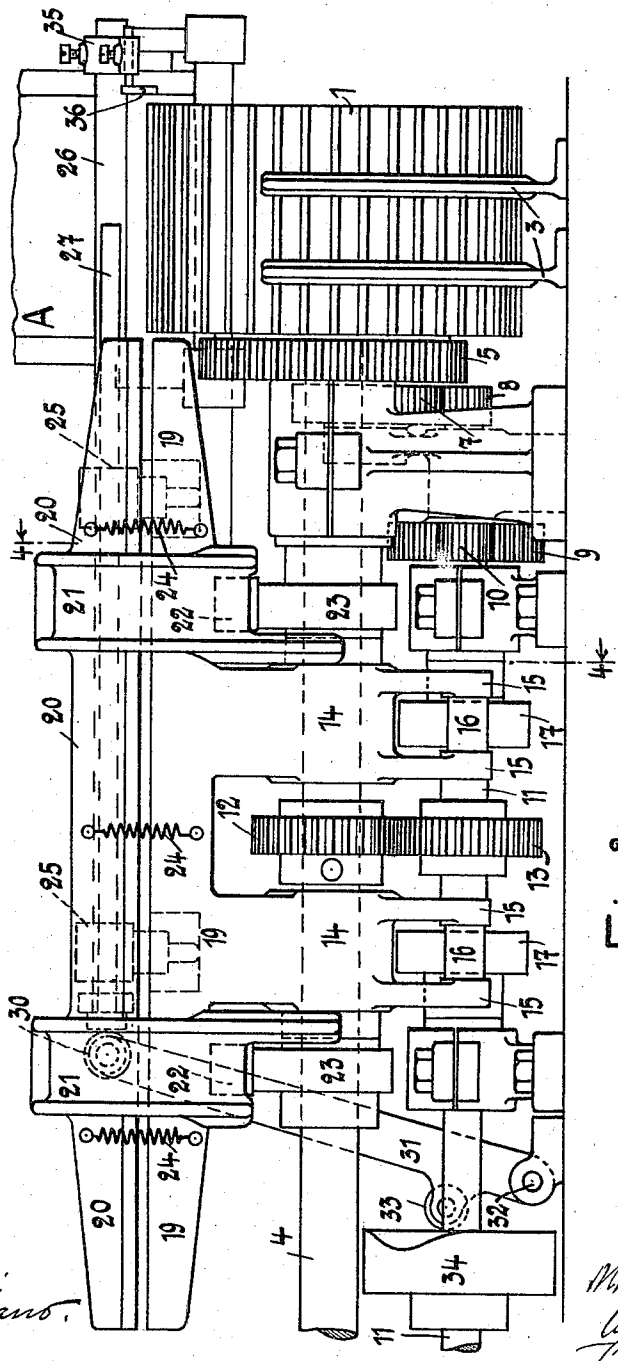


Fig. 2.

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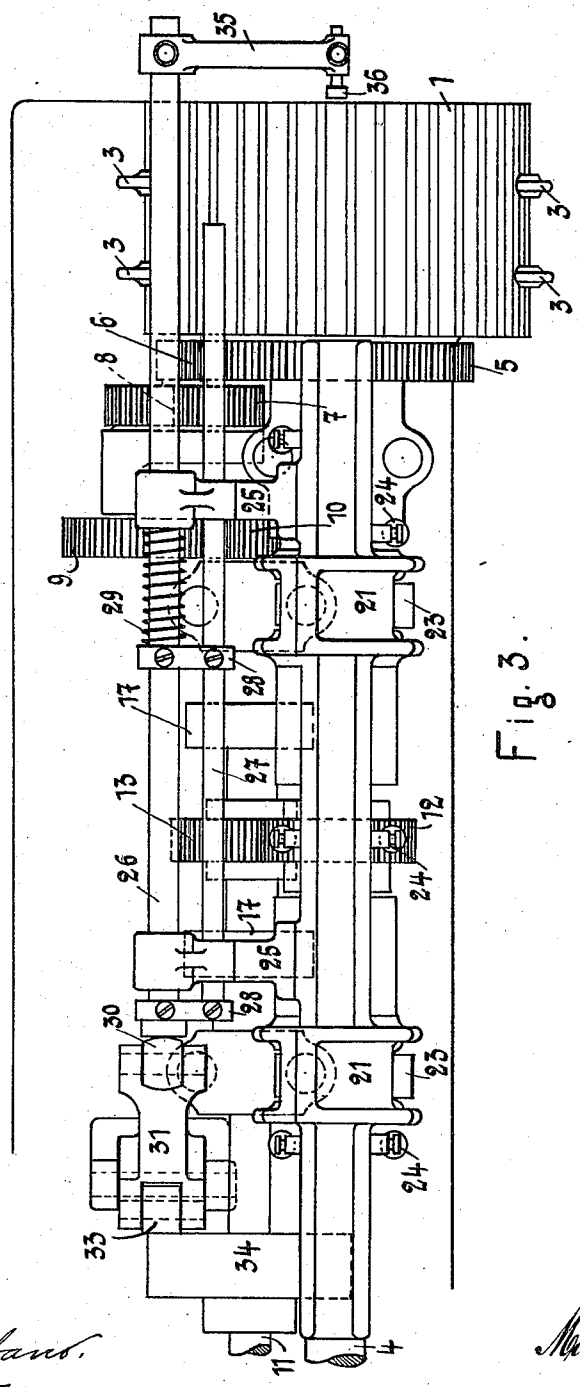


Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 5.

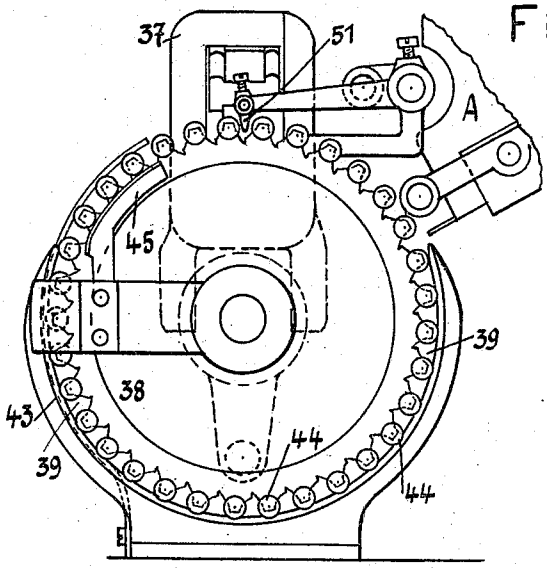


Fig. 6.

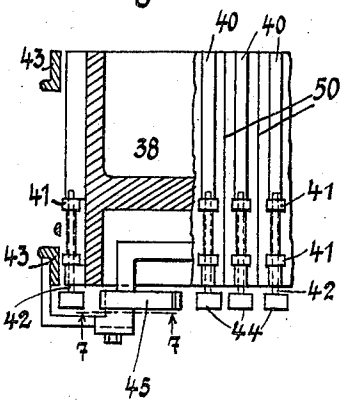


Fig. 7.

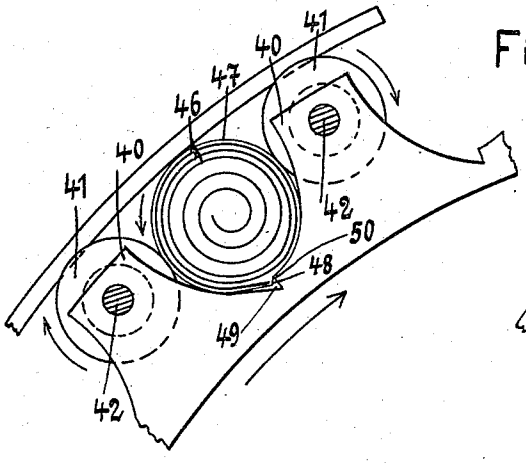
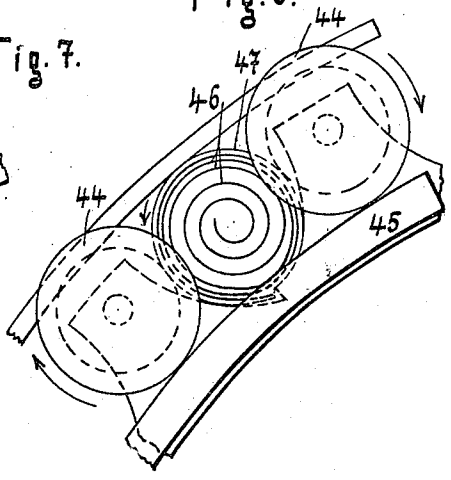


Fig. 8.



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UNITED STATES PATENT OFFICE.

MAX CLEMENS GRAHL, OF DRESDEN-LÖBTAU, GERMANY, ASSIGNOR TO UNIVERSELLE CIGARETTEN-MASCHINEN-INDUSTRIE SYSTEM OTTO BERGSTRÄSSER AKTIEN-GESELLSCHAFT, OF DRESDEN-LÖBTAU, GERMANY.

ARRANGEMENT FOR FLATTENING CIGARETTES OR CIGARETTE-TUBES.

1,184,444. Specification of Letters Patent. Patented May 23, 1916.

Application filed July 31, 1914. Serial No. 854,262.

To all whom it may concern:

Be it known that I, MAX CLEMENS GRAHL, a citizen of the Kingdom of Saxony, German Empire, residing in Dresden-Löbtau, in the Kingdom of Saxony, in said Empire, have invented certain new and useful Improvements in Arrangements for Flattening Cigarettes or Cigarette-Tubes, of which the following is a specification.

The new arrangement permits the flattening of single cigarettes or cigarette tubes fitted with mouthpiece in a continuous manner. In cigarette and tube machines in which a rope of tobacco is formed, this rope is simply sent through a pressing arrangement disposed in the direction of the rope, and the finished cigarettes or tubes must be individually treated. A difficulty follows in that the printed cigarettes must reach the pressing arrangement in a proper position, so that the socalled face of the flattened cigarette is, as it should be, in the middle of the one flat side. This turning of the cigarettes is however impossible with the hitherto known arrangements in which the cigarettes are placed singly in pressing molds having hinged lids and disposed on an endless conveyer belt, as the lids prevented the operator from turning the cigarettes into the proper position. Furthermore the output of such machines was small, as the hinged lids rendered the arrangement of an automatic laying device impossible and lastly the hinged lid presses did not work as favorably as the known vertically reciprocating pressing jaws, especially as the maintenance of the numerous individual presses also required much labor and attention. These disadvantages are completely obviated by the present invention by one single jaw press, and between the latter and the tube container a drum conveyer being provided. The conveyer drum is provided on its periphery with chambers for receiving a cigarette or tube each. By means of this drum the adjusting of the cigarettes or cigarette tubes may be effected either by hand or by mechanical means. For allowing of such manual adjustment the conveyer drum which is encircled over a part of its periphery by a guard to prevent the cigarettes from falling out, is so arranged, that the drum is open and accessible for a part of its periphery between the guard and the point at which the cigarettes are conveyed from the drum into the flattening arrangement, so that the cigaretttes can be adjusted by hand within this section. This arrangement allows the operator to turn the cigarettes into the proper position by simply passing her hand or fingers softly over the cigarettes lying in the open grooves of the drum.

If the drum is properly arranged, it may also be employed for mechanically adjusting the cigarettes or cigarette tubes, when these are provided with mouthpieces. In this case the conveyer drum is so arranged, that the mouthpiece end of the cigarette coming from the stock container passes with slight friction between two rollers projecting into the drum chambers through a guide surrounding the drum. The rollers are rotated shortly before the point at which the cigarettes are conveyed from the drum into the flattening arrangement, for example by riding on a cencentrically curved surface. By the rotation of the rollers the cigarette is carried along until the projection of the mouthpiece formed by the outside edge of the spiral and extending longitudinally of the cigarette abut against an undercut in the bottom of the chamber.

A further simplification and improvement in the pressing operation consists in the use of one single long jaw press. If for conveying and adjusting the cigarettes a drum provided with cells each of which receives one cigarette is employed, which drum has proved satisfactory for the feed in cigarette filling machines, and if such drum is made to revolve continuously for obtaining an uninterrupted operation, it will become necessary that the pressing attachment participates in the rotation of the drum, at least during the period, in which the cigarette is being conveyed from the drum into the pressing channel. The ejector, which conveys the cigarette must also participate in the rotation of the drum. Furthermore, it is necessary that the controlling means for the pressing channel and the ejector be so arranged, that while the drum advances by an amount equal to the distance between two chambers, the initial position is restored and that during such time the ciga-

rette is pressed flat, so that the previously opened pressing attachment is closed. Lastly it is necessary to exert a longer pressure on the cigarettes, in order to insure a more permanent molding. The present invention fulfils these objects by providing a continuously revolving drum with cells for receiving and adjusting one cigarette each, a long pressing head oscillating around the axis of the drum and having one fixed and one movable jaw, an ejector fitted to and guided in the oscillating pressing head for conveying the cigarettes from the cell in the drum into the pressing head, means for controlling this pressing head and the ejector so that the oscillation of the pressing head in the direction of rotation of the drum forward proceeds at the same speed as the rotation of the drum, the press jaws being opened in this interval, and the ejector, likewise traveling with the drum conveys a cigarette into the pressing passage. Then while the drum revolves further, the pressing head with the closing jaws and also the ejector quickly return into their initial position.

The new arrangement is shown in the accompanying drawings.

Figure 1 is a front elevation. Fig. 2 is a side elevation. Fig. 3 is a top view. Fig. 4 is a vertical section on the line 4—4 in Fig. 2, as seen in the direction of the arrow. Figs. 5–8 show the constructional form of the conveyer drum for mechanically adjusting the cigarettes or tubes with hollow mouthpiece; Fig. 5 being a side elevation, Fig. 6 a part top view with part section, Fig. 7 a sectional view on the line 7—7 in Fig. 6 seen in the direction of the arrow, and Fig. 8 a side elevation. Figs. 7 and 8 are drawn on a much enlarged scale.

In the following description first Figs. 1–4 are referred to.

The cigarettes or tubes are supplied on the bottom of the container A, serving as inclined chute to the drum 1, any suitable known device being provided at the end of the incline, for allowing of the passage of one cigarette at a time. This cigarette then enters into that recess or chamber 2 of the drum, which is at the moment just opposite the inclined chute. For preventing the cigarettes from falling out of the drum recesses while the drum revolves in the direction of the arrow (Fig. 1) the guards 3 have been provided which extend over a large portion of the periphery of the drum.

The drum is fitted loosely on the main shaft 4 and is rigidly secured to the toothed wheel 5. This wheel 5 meshes with the pinion 6 which is fitted on the same shaft as pinion 7. A pinion 8 meshes with pinion 7, which pinion 8 is mounted on the same shaft with a pinion 9. The pinion 9 meshes with a pinion 10 on a shaft 11. This shaft is driven by the toothed wheels 12, 13 from the main shaft 4. Because of the numerous gears the drum 1 revolves at a very slow speed in comparison with main shaft 4.

On the shaft 4 is fitted, loosely and revolubly, the pressing head, bearing with two eyes 14 on the shaft. These eyes have each two downward extensions 15 which carry a roller 16 revolubly fitted between them. These rollers coact with each a cam disk 17. The cam disks 17 are fitted to the driven shaft 11. A tensile spring 18, Fig. 1, tends to hold the rollers 16 in constant contact with the cam disks 17. These cam disks produce the rocking motion of the pressing head.

The pressing head consists of one fixed jaw 19 and a movable jaw 20, the said movable jaw being guided in the fixed jaw. (Fig. 4). The movable jaw 20 is fitted to a frame 21, which is guided in jaw 19 and on the eyes 14. This frame carries a roller 22, which coacts with a cam disk 23 fitted to shaft 4 in such a manner, that at each revolution of the shaft the movable jaw of the press is once lifted. The springs 24 tend to pull the movable jaw constantly down against the fixed jaw.

To the fixed member of the pressing head two laterally extending brackets 25 (Fig. 1) are secured through the bores of which the horizontally displaceable ejector rod 26 passes. In order to prevent a twisting of this rod, it is rigidly attached to a parallel rod 27 by means of links 28. The rod 27 is horizontally guided in the correspondingly arranged eyes of the brackets 25. A spring 29 wound around the rod 26 tends to shift the rod toward the left of Fig. 3. The left hand end of the rod bears against a roller 30, which is fitted to the upper end of the lever 31, which rocks on the fulcrum 32 and contacts by means of a roller 33 and the pressure of a spring 29 with a cam disk 34. As soon as the recess in the cam disk allows the rod 26 shoots to the left, in Fig. 3. By this movement a cigarette is ejected from the drum 1. For this purpose an arm 35 with ejector 36 is fitted to the end of rod 26. The ejector 36 is opposite to a cell of the drum and ejects therefrom the cigarette therein into the open mouth of the pressing head.

The cigarettes in the drum cells must be so adjusted by hand, that their socalled face is turned upward. As a number of cells are uncovered above the guards 3 up to the point where the cigarettes are ejected, the adjustment may be performed easily and quietly, by passing the finger lightly over the cigarettes or tubes.

The control of the pressing head by means of the cam disks 17 on shaft 11 is so arranged, that a part of the oscillation proceeds in the same direction and at the same

speed as the rotation of the drum. The open mouth of the pressing head is then exactly opposite to a drum cell, and that cell namely, opposite to which the ejector 36 is standing. As soon as this cell has reached the apex of the drum, the ejector is moved to the left and the cigarette in the cell is conveyed into the pressing head. While the drum continues to revolve in the direction of the arrow in Fig. 1 the pressing head returns together with the ejector into the initial position. During this time the press jaws 19 and 20 close and the cigarette introduced between them will be pressed flat.

The pressing head is made of such a length, that it can take several cigarettes behind each other. The just received cigarette rests during the pressing operation at the right hand end (Fig. 2) of the channel. It will subsequently be moved to the left in the channel by the following cigarette and then is submitted to the second compression. Each further cigarette introduced into the channel will cause a further shifting to the left and the cigarettes are each time compressed again. By such means a permanent molding of the cigarette is insured.

The pressing head may also be so constructed that it also forms a drum with cells for receiving each a cigarette. In this case the drum would have to be revolved, at least while the cigarette is being transferred to it, in the same sense and at the same speed as the adjusting drum. The ejector would then have to be fitted to an independent holder oscillating around the axis of the drum. If the pressing drum is made to continuously revolve in the same sense with the adjusting drum, a separate pressing jaw will have to be provided for each cell in the drum, which will press the cigarette in the cell flat until the cell again approaches the position at which it receives a fresh cigarette. Then the jaw rises and the newly introduced cigarette will eject the flattened cigarette from the cell.

When the cigarettes or cigarette tubes to be flattened shall be mechanically adjusted, the drum will have to be constructed of the form shown in Figs. 5–8. This mechanical adjusting may be performed only with such cigarettes or tubes, which have a stiff hollow mouthpiece. These previously finished cigarettes or tubes with hollow mouthpiece must be conveyed from the stock container A into the flat pressing attachment 37 in such a manner, that the cigarettes are in the correct position for being pressed. An intermediate conveying device is provided. As the cigarettes pass from the stock container into the conveyer in a position which is not fixed, it will be necessary for the cigarettes to be turned in the latter into their proper position.

The conveyer consists of a drum 38 which is provided on its periphery with open chambers 39 for receiving each one cigarette. In the ribs 40 formed by the said chambers at the edge of the drum (see Fig. 6) two rollers 41 each are disposed, which are fitted rigidly to a shaft 42 revolubly journaled in said rib and extending longitudinally thereto. It will be preferable to make these rollers exchangeable. The arrangement for exchanging the rollers is immaterial and has therefore been omitted from the drawing.

When a cigarette is introduced into the chamber 39, the two rollers 41 are in the range of the hollow mouthpiece of the cigarette. As the rollers, as evident from Figs. 7 and 8, project into the chamber, and their diameter has been accordingly determined, they seize the hollow mouthpiece of the cigarette with a slight friction. The rollers are so journaled, that the longitudinal axis of the cigarette pressed down to the bottom of the chamber is lower than the longitudinal axes of the rollers, so that the rollers will act a little above the middle of the cigarette and therefore tend to force down the cigarette.

For directing the mouthpiece of the cigarette arriving from the stock container A in front of a corresponding pair of rollers into the respective chamber 39 a rising guide 43 is provided, which lies outside around the drum and by the rise of which the mouthpiece is forced with a slight friction between the pair of rollers onto the bottom of the respective chamber 39. This guide extends concentrically around the greater part of the drum and prevents the cigarettes, once introduced, from falling out.

At a short distance before the cigarette in the chamber arrives at the pressing attachment 37 the rollers 44 which are fitted to the ends of the shafts 42 projecting beyond the flange of the drum ride on a concentrical cam 45. Thereby the rollers 40 are revolved in the same direction and the cigarette gripped between them with a slight friction is revolved in the opposite direction (as indicated by the arrows in Figs. 7 and 8).

The mouthpiece of the cigarette contains in known manner the mouthpiece spiral 46 which lies with its outer turns against the thin tissue paper tube 47 of the cigarette. The end of the outermost turn is formed by the edge 48 which extends longitudinally to the cigarette. A little gaping of the outer end of the outermost turn of the mouthpiece spiral cannot be avoided. This circumstance is utilized with the present invention. The wall of the chamber 39 is not profiled exactly corresponding to a circular curve, but is undercut a little at 49 at the bottom of the chamber. This deviation from the cir-

cular curve is on that side of the chamber (on the left in Figs. 7 and 8) which, at the revolution of the cigarette comes first in contact with the several points thereof. This undercutting allows of the free end of the last turn of the mouthpiece spiral gaping, although the mouthpiece is tightly pressed against the bottom of the chamber 39. Thus the edge 48 of this turn forms a resistance, which at the rotation of the mouthpiece will abut against the sharply defined edge 50 of the undercut and thereby hold the cigarette at a given position. This is the position which the cigarette must assume, in order to reach the pressing attachment 37 in the correct position. It then need only be transferred by means of the ejector 51 into the pressing channel where it will be properly flattened. By such simple and ingenious means the cigarettes or cigarette tubes may be mechanically adjusted.

I claim:

1. In an arrangement for flattening cigarettes or cigarette tubes taken from a stock, the combination of a stock container, a revoluble drum having on its periphery a plurality of chambers each adapted to receive one cigarette or cigarette tube, the periphery of said drum being adjacent to said container, means for feeding the cigarettes or cigarette tubes from said container into said chambers, a flattening press, an ejector adapted to eject the cigarettes from said chambers into said flattening press, and a guard extending over a part of the periphery of said drum and adapted to prevent the cigarettes from falling out of said chambers, a portion of said periphery being unprotected by and free from said guard and extending away from said ejector in the direction opposite from the point at which said container is situated, and means for slowly revolving said drum in such a direction that said cigarettes pass over said unprotected portion of said periphery before reaching said ejector, the revolution of said drum being so slow that the cigarettes can be manually placed in a given position while they traverse said unprotected portion and before they reach said ejector.

2. In an arrangement for flattening cigarettes or cigarette tubes taken from a stock, the combination of a rotary drum disposed between the stock container and the flattening press, said drum having on its periphery a plurality of chambers adapted to receive each one cigarette or cigarette tube, a guard covering said drum partly over its periphery and adapted to prevent the cigarettes from falling from said chambers, but leaving the drum with the cigarettes thereon free for a distance between said guard and the point at which the cigarettes are transferred to the flattening press, said flattening press being composed of a fixed and a movable jaw, an ejector adapted to transfer the cigarettes from said chambers into said flattening press, said flattening press with said ejector being oscillatingly fitted around the axis of said drum, and adapted to travel with the drum at the same speed during the introduction of the cigarette into the press, but to quickly return into their initial position after such introduction is completed.

3. In an arrangement for flattening cigarettes or cigarette tubes taken from a stock, the combination of a rotary drum disposed between the stock container and the flattening press, said drum having on its periphery a plurality of chambers adapted to receive each a cigarette or cigarette tube, a guard covering said drum partly over its periphery and adapted to prevent the cigarettes from falling from said chambers, but leaving the drum with the cigarettes thereon free for a distance between said guard and the point at which the cigarettes are transferred to the flattening press, said flattening press being composed of a fixed and a movable jaw, an ejector adapted to transfer the cigarettes from said chambers into said flattening press, said flattening press with said ejector being oscillatingly fitted around the axis of said drum and adapted to travel with the drum at the same speed during the introduction of the cigarette into the press, but to quickly return into their initial position after such introduction is completed, a cam disk fitted to the drum shaft acting as main shaft, said cam disk controlling the movable press jaw and opening the press while the press is rocked forward and closing the press during the return motion, said press being of such a length, that it may contain several cigarettes behind each other at one time.

4. An arrangement for mechanically adjusting cigarettes or cigarette tubes with hollow mouthpiece to be pressed flat, comprising a rotary drum between the stock container and the flattening press, said drum being adapted to receive one cigarette at a time in chambers provided on its periphery, rollers conducting the end of the mouthpiece with a slight friction in a guide surrounding the said drum, a cam adapted to rotate said rollers riding thereon shortly before the point of discharge, in the bottom of said chambers an undercut adapted to abut against the longitudinally extending edge of the mouthpiece spiral of the cigarette revolved by said rollers.

5. An arrangement for mechanically adjusting cigarettes or cigarette tubes with hollow mouthpiece to be pressed flat, comprising a rotary drum between the stock container and the flattening press, said drum being adapted to receive one cigarette at a time in chambers provided on its periphery, rollers conducting the end of the mouthpiece with a slight friction in a guide surround-

ing the said drum, a cam adapted to rotate said rollers riding thereon shortly before the point of discharge, an undercut in the bottom of said chambers adapted to abut against the longitudinally extending edge of the mouthpiece spiral of the cigarette revolved by said rollers, the longitudinal axes of said rollers being radially disposed to the drum farther outside than the longitudinal axis of the cigarettes in said chambers, said cigarette being thereby forced downward.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

MAX CLEMENS GRAHL.

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."