June 23, 1936. A. A. STONE ET AL 2,045,337

PACKING MACHINE

Filed Aug. 16, 1934 4 Sheets-Sheet 1

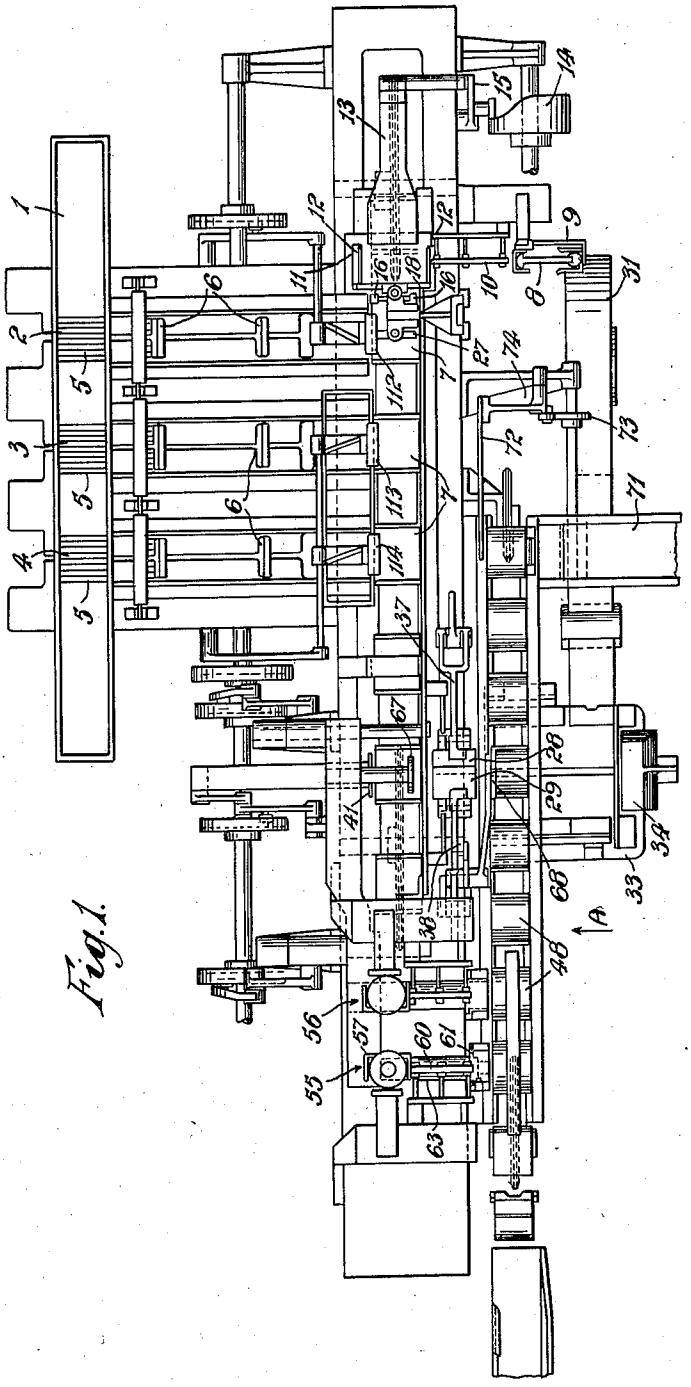


Fig. 1.

INVENTOR
A. A. Stone
& R. C. Clarkson
By Watson, Coit, Moore & Grindle
ATTYS.

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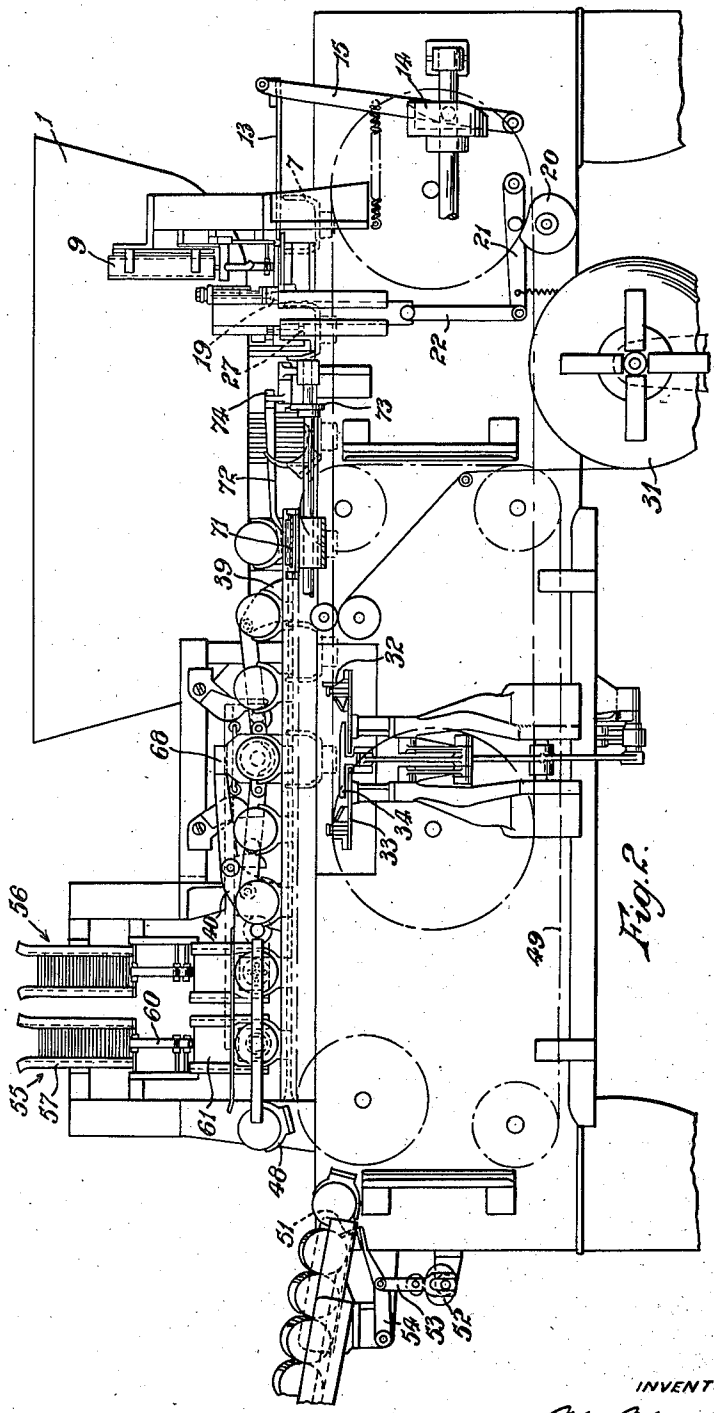



Fig. 2.

INVENTOR
A. A. Stone
& R. Clarkson
By Watson, Coit, Moore & Grindle
ATTYS.

June 23, 1936. A. A. STONE ET AL 2,045,337

PACKING MACHINE

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Fig. 4.

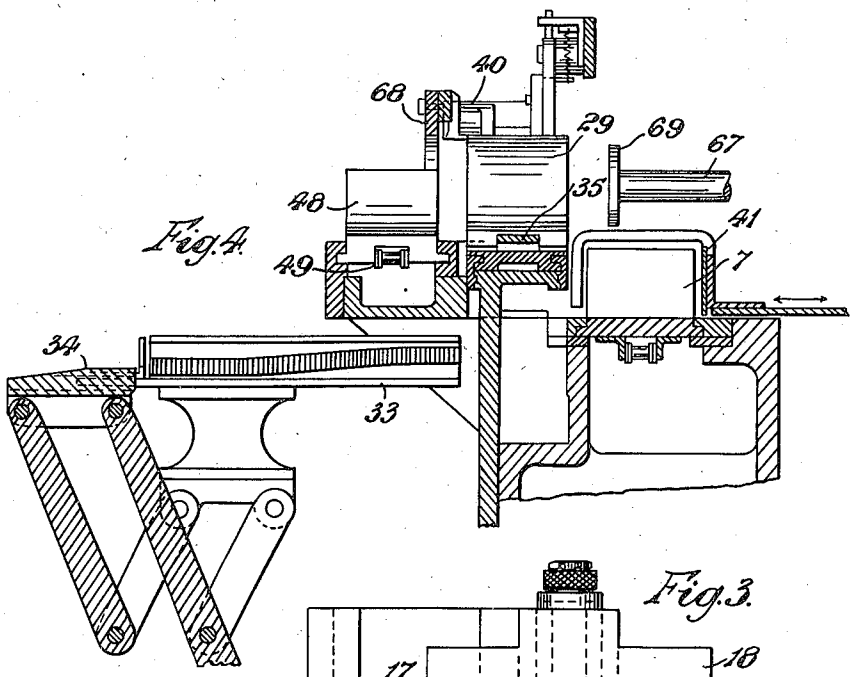



Fig. 3.

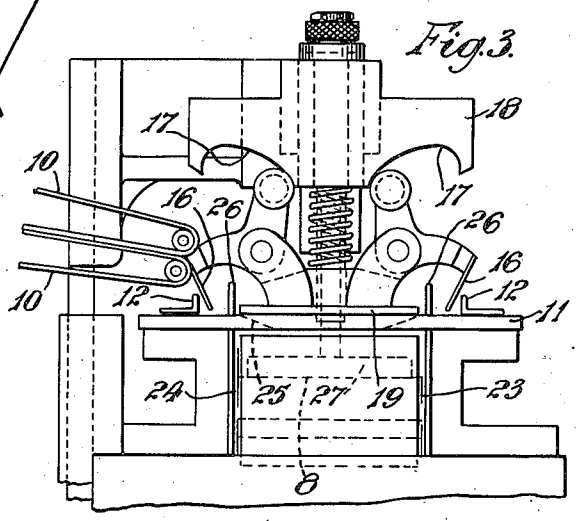
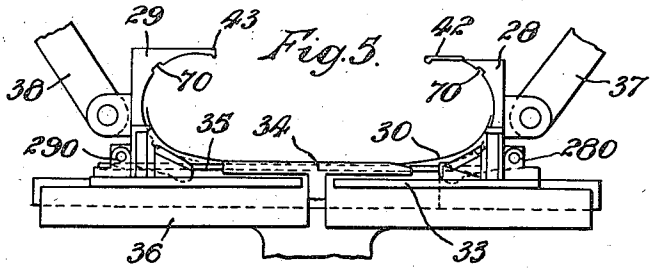



Fig. 5.




INVENTOR

A. A. Stone

& R. Clarkson,

By Watson, Coit, Moore & Grindle

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Fig. 6

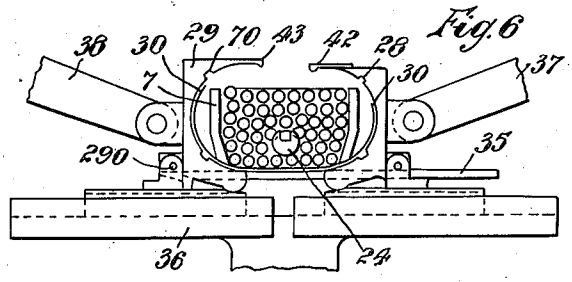



Fig. 9.

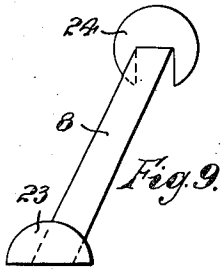
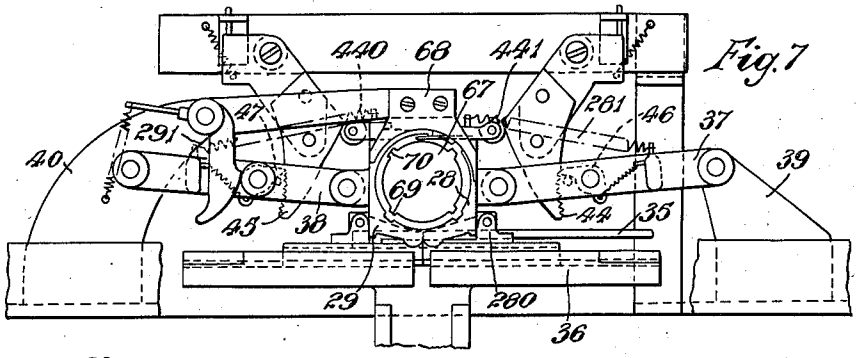



Fig. 7



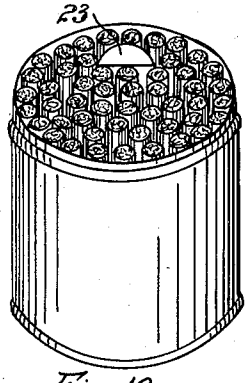




Fig. 10.

Fig. 8.




INVENTOR

A. A. Stone

R. Clarkson

By Watson, Cole, Moore & Grindle

ATTYS.

Patented June 23, 1936 2,045,337

# UNITED STATES PATENT OFFICE

2,045,337

## PACKING MACHINE

Albert Alexander Stone and Russell Clarkson,
Deptford, London, England

Application August 16, 1934, Serial No. 740,182
In Great Britain August 23, 1933

14 Claims. (Cl. 226—5)

This invention is for a new or improved packing machine, and relates to a machine for packing batches of cigarettes, for example, batches of fifty, in rigid block ended containers, such for example as cylindrical or oval shaped tins, which may afterwards be hermetically sealed, and which are commonly used for the export trade in cigarettes.

According to the present invention there is provided a machine for packing a plurality of rod shaped articles (e. g. cigarettes) in a rigid block ended container (e. g. a circular or oval tin) comprising means to feed the articles from a source of supply, means to form the batch to substantially the size and shape of the container, means to feed a container into position to receive the batch, said container being disposed lengthwise in a horizontal plane with its open ends directed towards the batch to be inserted therewith and means to move the batch lengthwise into the container.

Further, according to the present invention there is provided a machine for packing a plurality of rod shaped articles (e. g. cigarettes) in a rigid block ended container (e. g. a circular or oval tin) comprising means to feed the articles from a source of supply, means to place a wrapper about the articles and to form the batch to substantially the size and shape of the container, said means being arranged to receive a wrapper at a level below that at which the articles are collated and raised to the level of the batch before receiving the same, means to feed a container into position to receive a wrapped batch, said container being disposed lengthwise in a horizontal plane with its open end directed towards the batch to be inserted thereinto, said container being arranged at a level above that at which the batch is collated, said batch being raised to the level of the container during the folding of the wrapper about the batch and means to move the batch lengthwise into the container.

The invention will be more particularly described with reference to the accompanying drawings in which:—

Figure 1 shows a plan view of a machine constructed in accordance with the invention.

Figure 2 shows a side elevation of Figure 1 taken in the direction of the arrow A.

Figure 3 shows a detail of a mechanism for folding the pulling strips before they are incorporated with a batch of cigarettes.

Figure 4 is a sectional side elevation showing the mechanism for inserting a wrapper into the forming mechanism and the mechanism for placing the cigarettes on the wrapper and the wrapped cigarettes into the tin.

Figure 5 is a detail view showing the wrapper after it has been fed between the folding mechanism.

Figure 6 is a view similar to Figure 5, and shows the folding mechanism in a different position.

Figure 7 illustrates the folding mechanism when it has completed the folding operations.

Figure 8 shows the mechanism for feeding and inserting a disc or coupon into an empty tin.

Figure 9 is a perspective view showing a pulling member folded into the form in which it is inserted into the tin.

Figure 10 is a perspective view showing a tin filled with cigarettes and a pulling member.

Like references refer to like parts throughout the various figures of the drawings.

Referring to Figure 1, the cigarettes are contained in a hopper 1, which is divided into three compartments 2, 3, and 4, and each of the compartments is formed with vanes 5 between which the cigarettes fall on to the bed of the machine. Each of the compartments 2, 3, and 4 has co-operating therewith, a conveyor provided with pusher pieces 6, each of which is arranged to remove a predetermined number of cigarettes from the bottom of the hopper and deliver them to the pockets 7 of an intermittent mould chain conveyor. As the batches of cigarettes delivered from the compartments 2, 3, and 4 have to be placed one upon the other in the pockets 7, each batch is delivered in turn to a table from which they are moved into the pockets 7 by plungers 112, 113, and 114. The plungers are operated simultaneously so that at each operation a batch of cigarettes is delivered from each compartment into one of the three pockets positioned before the compartments as seen in Figure 1. The cigarettes from the compartments 3 and 4 are delivered on to tables which are movable in a vertical direction and which when a batch of cigarettes has been deposited thereon are raised to a level such that the plungers 113 and 114 can push the batches into the pockets 7 without in any way interfering with the cigarettes already contained in the pockets. The vertical movement of the tables may be effected by any suitable cam or other mechanism, not shown. In this way it will be seen that at each movement of the pocket 7 before the hopper 1, a batch of cigarettes is deposited into the pocket, and when the pocket 7 has received a batch of cigarettes from the

compartment 4, it contains the required number of cigarettes for insertion into a container.

In some instances it is desired to include in the batch of cigarettes a pulling member 8 which is preferably constructed of thin carboard and is formed as illustrated in Figure 9. When it is desired to include one of these members, they are contained within a stacker 9 from which they may be removed by a suction device similar to that shown in Figure 8 and described hereinafter, and are fed between belts 10 and are deposited on the plate 11 between guides 12 (see Figure 3) which are positioned above the pockets 7 of the mould chain conveyor. When the members 8 are in the position described, a plunger 13 (see Figure 1) operated by a cam 14 and a lever 15, moves them into a position at which they are operated upon by a pair of pivoted folders 16 (shown in Figure 3) operated by cam surfaces 17 formed in the plunger head 18 of a presser 19, which is operated by a cam 20 and levers 21 and 22. The presser 19 is arranged to hold the member 8 firmly on the plate 11 whilst the folders 16 fold the portions 23 and 24 of the member 8 beneath the cut-away portions 25 of the plate 11. During the time that the portions 23 and 24 are being folded by the folders 16 the plunger 13 is held in a stationary position, and after the portions 23 and 24 have been folded, the presser 19 is raised and the plunger 13 is again moved and passes the members 8 between the guides 26 and during their movement between the guides 26 and the portions 23 and 24 spring outwardly, due to their natural resiliency, and assume a position shown in Figure 9. The plunger 13 delivers the members 8 beneath a further plunger 27 which is also operated by the cam 20 in such a manner that as the presser 19 operates to grip a member 8 as above described, the plunger 27 descends and presses the folded member downwardly into the pocket 7 which is positioned before the compartment 2. Just before the plunger 27 presses the member 8 into the pocket a group of cigarettes has been delivered into the pocket from the compartment 2, so that the member 8 is pressed by the plunger 27 on to the upper surface of this group of cigarettes. The remaining groups of cigarettes from the compartments 3 and 4 are then deposited on to the top of the member 8.

The filler pockets containing batches of cigarettes are then moved to a position at which they are removed from the pockets 7 and are inserted between a pair of folder blocks 28 and 29 which are arranged to fold a strip 30 of wrapping material around the batch and also to align the wrapped batch of cigarettes with the open end of a tin.

Referring to Figures 2, 5, 6, and 7, the strips of wrapping material 30 are fed from a reel 31 from which the wrapper lengths are severed by means of cutting mechanism 32, and the severed strips are deposited on to a table 33 from which they are moved by a horizontally moving plunger 34 and deposited on a plate 35 in the manner illustrated in Figure 5. When the strips 30 are delivered on to the plate 35 between the open folding members 28 and 29, the folding members and plate 35 which are slidably mounted on a carrier 36 are at a level which is below the level of the bottom of the pockets 7. The folding mechanism is then raised to the level of the bottom of the pockets 7, the carrier 36 being moved upwardly by any suitable mechanism, not shown. During the upward movement of the carrier 36, the folding elements 28 and 29 are arranged to move inwardly towards each other, and assume a position shown in Figure 6. In order to effect the sliding movement of the folders 28 and 29, they are connected by means of pivoted arms 37 and 38 to fixed brackets 39 and 40. It will be seen from Figure 7 that any vertical movement of the carrier 36 will cause the folders 28 and 29 to move towards or away from each other. The plate 35 is fixed to the folder 29 so that it moves with the folder, and so enables the wrapper 30 to be supported during the whole of the time that it is in position between the folders 28 and 29.

When the folders 28 and 29 together with the wrapper 30 have been raised to the level of the pocket 7 as shown in Figure 6, a plunger 41 is arranged to push the cigarettes endwise out of the pocket 7, and deposit them between the folders 28 and 29, and on the wrapper 30. After this operation is completed, the plunger 41 is moved away from the folders 28 and 29 and the carrier 36 is then again caused to move upwardly to the level of the tins into which the cigarettes are to be inserted. During this further upward movement of the folders 28 and 29 the folders are caused to move still further inwardly until they assume the position shown in Figure 7, from which figure it will be seen that they are completely closed together thereby forming the batch of cigarettes into a shape substantially that of the container into which they are inserted, and the diameter of the formed batch is slightly less than the diameter of the tin into which they are to be inserted, in order to facilitate their insertion into the tin.

The folders 28 and 29 are provided with spring catches 42 and 43, which are arranged to fold the wrapper 30 in such a manner that one edge overlaps the other.

In order to facilitate the operation of the folders 28 and 29 in forming the batch into the desired cross-section the cigarettes, during their upward movement with the folders, are agitated in order that they may more readily conform to the gradually altering configuration of the folders 28 and 29 as they are brought together. The agitation is provided by a pair of racks 44 and 45, with which pawls 46 and 47 connected with the arms 37 and 38 co-operate during the upward movement of the folders. The racks 44 and 45 have faces which press against rollers 440 and 441 mounted on the folders 28 and 29. These latter are pivoted at 280 and 290 and are spring urged by springs 281 and 291. As the arms 37 and 38 carry the pawls upwardly, the pawls engage the racks 44 and 45, and agitate the latter, and these in turn agitate the folders 28 and 29.

When the folders 28 and 29 reach their uppermost position they are in alignment with the open end of a tin which is lying on its side, as seen clearly in Figure 8, the tins having been brought into position by the pockets 48 of the intermittent conveyor 49, the tins being fed into the pockets down a chute 50 as clearly seen in Figure 2. A stop 51 operated by a cam 52 and levers 53 and 54 is arranged to prevent a tin from proceeding down the chute until a pocket is in position to receive the tin.

In some cases it is desired to place one or more discs containing advertising matter, or coupons, or pictures in the tin, and when this is the case, they are preferably inserted into the tin before the batch of cigarettes is inserted thereinto. Referring to Figure 2, two disc feeding apparatuses 55 and 56 are shown, one of the apparatuses being

shown in detail in Figure 8. The discs are contained in a magazine 57, from which they are fed by an oscillating suction device 58, of known construction, and are fed between a pair of rollers 59 which feed the discs between bands 60 operative to feed the discs down a chute 61 into position before the open end of the tin 62. When a disc is in position, a plunger 63 is arranged to press the disc into the tin, and if the disc is provided with a centre aperture as are the discs shown in the disc feeding device 55 illustrated in Figure 1, the plunger 63 may be made in two parts, as shown in Figure 8, the part 64 being provided to align the disc in the tin and the portion 64 is prevented from moving right to the bottom of the tin by means of the stop 65, secured thereto, which is arranged to engage with the stop 66 before the portion 63 presses the disc against the bottom of the tin.

After the discs have been inserted into the tin, the tin is brought into position before the formed batch of cigarettes, and a plunger 67 is arranged to engage with the cigarettes and press them into the open end of the tin. Whilst the cigarettes are being inserted into the tin, a gripping member 68 is arranged to descend and grip the tin between the bottom of the pocket 48 and the gripper 68, so as to hold the tin against endwise movement during the insertion of the cigarettes. In order to ensure that the wrapper which has been wrapped about the cigarettes is moved into the container together with the cigarettes, and is not displaced during the movement, the plunger 67 is provided with small projections 69, which co-operate with slots 70 formed in the folding elements 28 and 29 as seen clearly in Figures 4 and 7.

The filled tins are then moved into position before a table or travelling band 71, at which position an ejector 72 operated by a cam 73 and lever 74 is arranged to engage with the underside of the tin and to eject it from the pocket 48 of the conveyor 49, and to place the tin in an upright position upon the band or table 71. The ejector 72 is turned about its pivot until it engages the underside of the tins, after which it moves through an arc until the tins are in an upright position. The filled tins may be removed from the band or table 71 manually or by any suitable means, or if desired the band 71 may convey the filled tins to mechanism for sealing the open ends of the tins.

What we claim as our invention and desire to secure by Letters Patent is:—

1. In a machine for packing cigarettes in rigid, block ended containers of generally curvilinear transverse contour, the combination with means for feeding a batch of cigarettes, of devices receiving said batch from said means for forming the batch to conform generally in transverse section to the transverse contour of the container and for simultaneously applying a wrapper to said batch, said devices including at least two elements engaging the sides of the batch and relatively displaceable toward each other, means for agitating the batch during such formation, means for supporting a container with the open end thereof directed toward the formed batch, and means for effecting relative displacement of the container and batch to insert the formed batch lengthwise into the container.

2. A machine for packing a plurality of cigarettes in a rigid, block ended container of generally curvilinear cross-section, comprising means to feed the cigarettes from a soruce of supply, devices for forming a batch of cigarettes to substantially the size and shape of the container, said devices including at least two elements engaging the sides of the batch and relatively displaceable towards each other, mechanism for introducing a removable extracting element in said batch, means for agitating the batch during such formation, means to feed a container into position to receive the batch, said container being disposed lengthwise in a substantially horizontal plane with its open end directed towards the batch, and means for effecting relative movement of the container and batch to insert the batch lengthwise into the container.

3. In a machine for packing cigarettes in rigid, block ended containers of generally curvilinear transverse contour, the combination with means for feeding a batch of cigarettes, of devices receiving said batch from said means for forming the batch to conform generally in transverse section to the transverse contour of the container, means for agitating the batch during such formation, means for supporting a container with the open end thereof directed toward the formed batch, and means for effecting relative displacement of the container and batch to insert the formed batch lengthwise into the container.

4. In a machine for packing cigarettes in a rigid, block ended container of generally curvilinear transverse contour, the combination with devices for receiving and forming a batch of cigarettes to conform generally in transverse section to the transverse contour of the container, of means for effecting relative lengthwise displacement of said batch and a container to insert the formed batch into said container and for agitating said batch during such formation.

5. In apparatus of the class described, the combination with means for receiving a batch of cigarettes, said means including relatively displaceable elements arranged for engagement with the sides of the batch, of means for displacing said elements toward each other to alter the shape of the batch, and means for agitating said elements during displacement thereof.

6. In apparatus of the class described, the combination with means for receiving a batch of cigarettes, said means including relatively displaceable elements arranged for engagement with the sides of the batch, of means for displacing said elements toward each other to alter the shape of the batch and for simultaneously elevating said batch, means for agitating the batch during such formation, and means for feeding a container to a position adjacent the elevated position of the shaped batch.

7. In apparatus of the class described, the combination with means for receiving a batch of cigarettes, said means including relatively displaceable elements arranged for engagement with the sides of the batch, of means for displacing said elements toward each other to alter the shape of the batch, and means for feeding a wrapper onto said means prior to the reception of the cigarette batch thereby, whereby displacement of said elements serves to fold the wrapper about the batch.

8. In apparatus of the class described, the combination with means for receiving a batch of cigarettes, said means including relatively displaceable elements arranged for engagement with the sides of the batch, of means for displacing said elements toward each other to alter the shape of the batch, means for feeding a wrapper onto said means prior to the reception of the cigarette batch thereby, whereby displacement of said elements serves to fold the wrapper about

the batch, and a device associated with said elements for directing the ends of the wrapper past one another as the elements are displaced.

9. In a machine for packing cigarettes in rigid, block ended containers of generally curvilinear transverse contour, the combination with means for feeding a batch of cigarettes, of devices receiving said batch from said means for forming the batch to conform generally in transverse section to the transverse contour of the container and for simultaneously applying a wrapper to said batch, means for introducing an insert in the bottom of said container, means for supporting the container with the open end thereof directed toward the formed batch, and means for effecting relative displacement of the container and batch to insert the formed batch lengthwise into the container.

10. In a machine for packing cigarettes in rigid block-ended containers of generally curvilinear transverse contour, the combination with a cigarette hopper, of means for withdrawing cigarettes from said hopper in a plurality of groups spaced laterally of the cigarettes in the groups, with the axes of the cigarettes generally parallel, means for successively feeding the groups of cigarettes onto the conveyor in superposed relation to form a batch, devices for forming the batch of cigarettes to substantially the size and shape of the container, means for agitating the batch during such formation, means for supporting a container with the open end thereof directed towards the formed batch, and means for effecting relative displacement of the container and the batch to insert the formed batch lengthwise into the container.

11. In a machine for packing cigarettes in rigid block-ended containers of generally curvilinear transverse contour, the combination with a cigarette hopper, of means for withdrawing cigarettes from said hopper in a plurality of groups spaced laterally of the cigarettes in the groups, with the axes of the cigarettes generally parallel, means for successively feeding the groups of cigarettes onto the conveyor in superposed relation to form a batch, devices receiving said batch from said conveyor for forming the batch to conform generally in transverse section to the transverse contour of the container, said devices including at least two elements engaging the sides of the batch and relatively displaceable towards each other, means for agitating the batch during such formation, means for supporting a container in the open end thereof directed towards the formed batch, and means for effecting relative displacement of the container and batch to insert the formed batch lengthwise into the container.

12. In a machine for packing cigarettes in rigid block-ended containers of generally curvilinear transverse contour, the combination with a cigarette hopper, of means for withdrawing cigarettes from said hopper in a plurality of groups spaced laterally of the cigarettes in the groups, with the axes of the cigarettes generally parallel, means for successively feeding the groups of cigarettes onto the conveyor in superposed relation to form a batch, devices receiving said batch from said conveyor for forming the batch to conform generally in transverse section to the transverse contour of the container, and for simultaneously applying a wrapper to said batch, said devices including at least two elements engaging the sides of the batch and relatively displaceable towards each other, means for agitating the batch during such formation, means for supporting a container with the open end thereof directed towards the formed batch, and means for effecting relative displacement of the container and batch to insert the formed batch lengthwise into the container.

13. In a machine for packing cigarettes in a rigid block-ended container of generally curvilinear transverse contour, the combination with a cigarette hopper, of means for withdrawing cigarettes from said hopper in a plurality of groups spaced laterally of the cigarettes in the groups, with the axes of the cigarettes generally parallel, means for successively feeding the groups of cigarettes onto the conveyor in superposed relation to form a batch, devices receiving said batch from said conveyor for forming the batch to conform generally in transverse section to the transverse contour of the container, said devices including at least two elements engaging the sides of the batch and relatively displaceable toward each other, means for agitating the batch during such formation, mechanism for introducing a removable extracting element in said batch, means for supporting a container with the open end thereof directed toward the formed batch, and means for effecting relative displacement of the container and batch, to insert the formed batch lengthwise into the container.

14. In a machine for packing cigarettes in rigid block-ended containers of generally curvilinear transverse contour, the combination with a cigarette hopper, of means for withdrawing cigarettes from said hopper in a plurality of groups spaced laterally of the cigarettes in the groups, with the axes of the cigarettes generally parallel, means for successively feeding the groups of cigarettes onto the conveyor in superposed relation to form a batch, devices receiving said batch from said conveyor by forming the batch to conform generally in transverse section to the transverse contour of the container, and for simultaneously applying a wrapper to said batch, said devices including at least two elements engaging the sides of the batch and relatively displaceable toward each other, means for agitating the batch during such formation, mechanism for introducing a removable extracting element in the said batch, means for supporting a container with the open end thereof directed towards the formed batch, and means for effecting relative displacement of the container and batch to insert the formed batch lengthwise into the container.

ALBERT ALEXANDER STONE.
RUSSELL CLARKSON.