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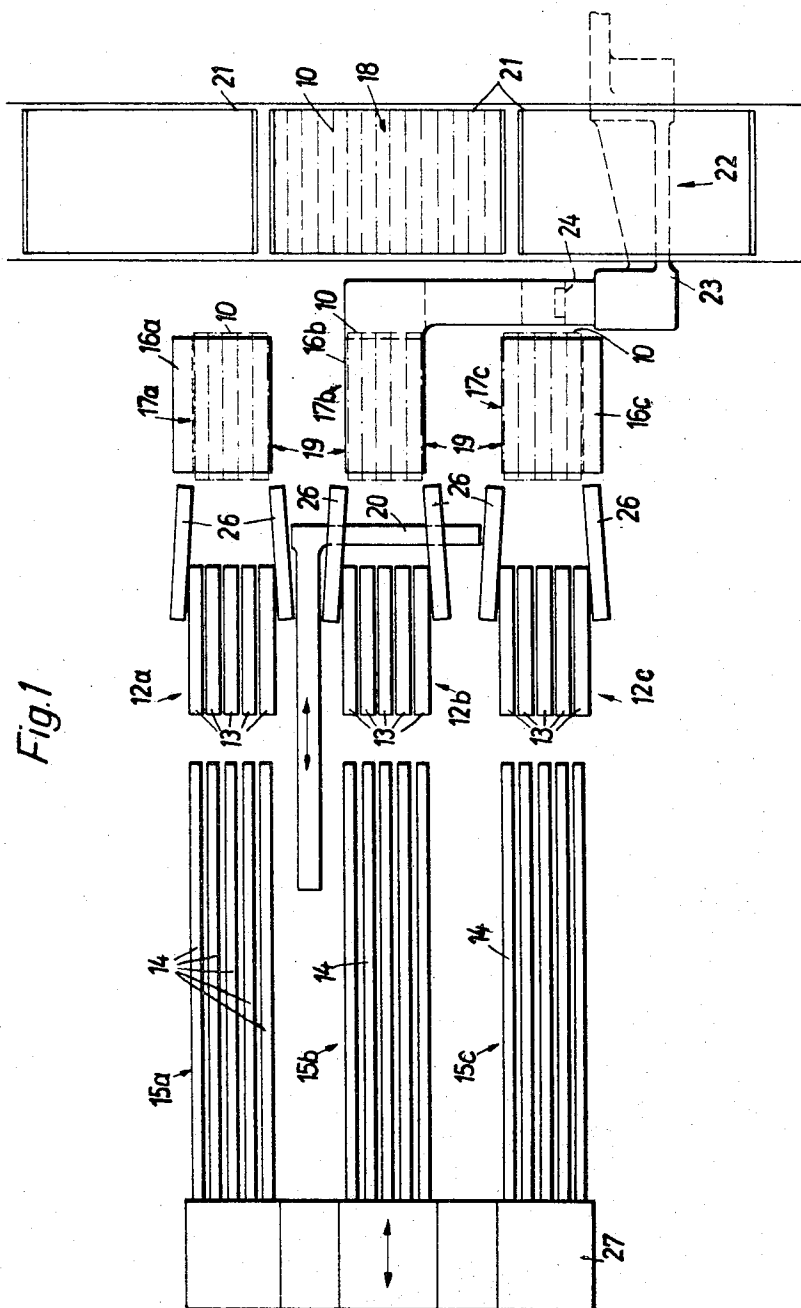
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3,403,493

DEVICE FOR FORMING A BATCH OF CIGARETTES

Filed Jan. 13, 1966

5 Sheets-Sheet 1



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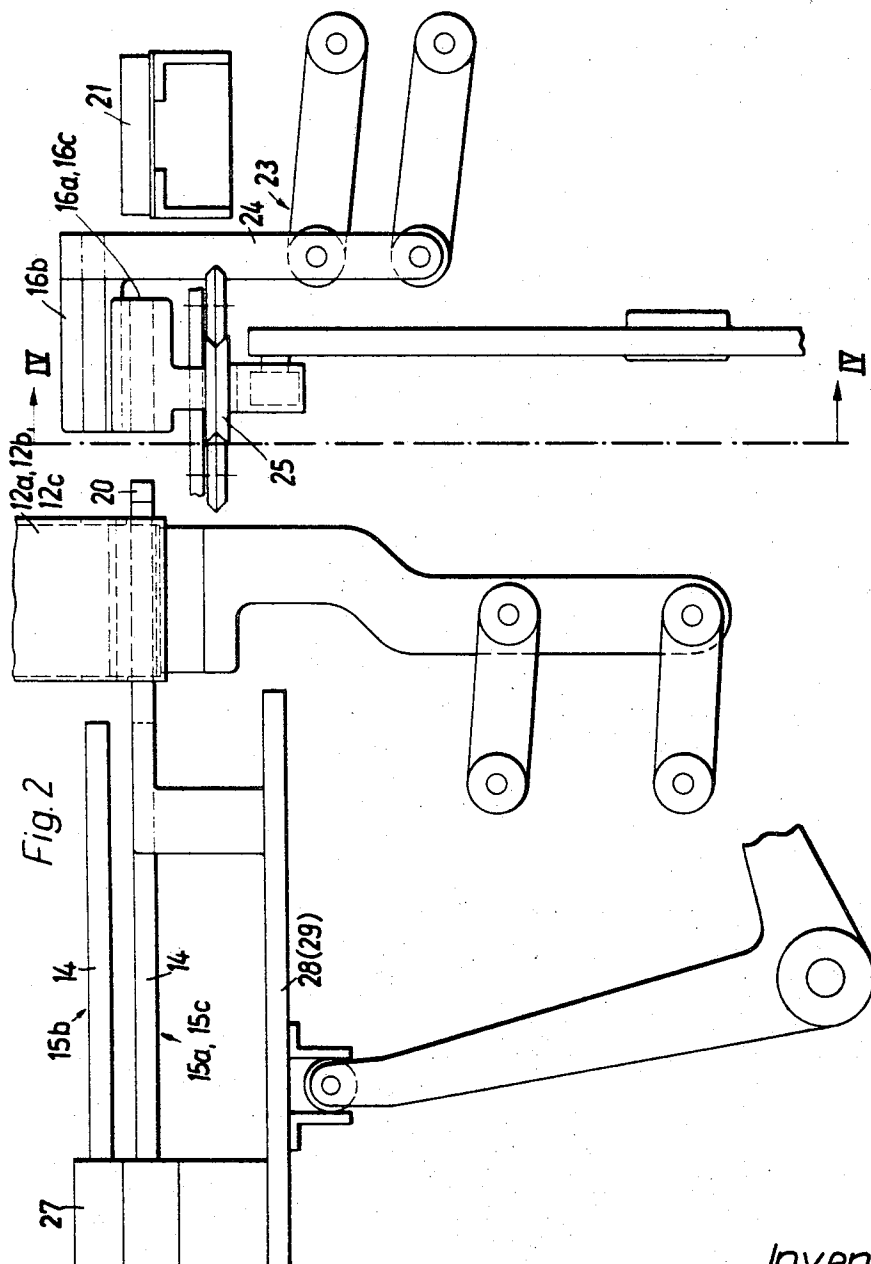
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DEVICE FOR FORMING A BATCH OF CIGARETTES

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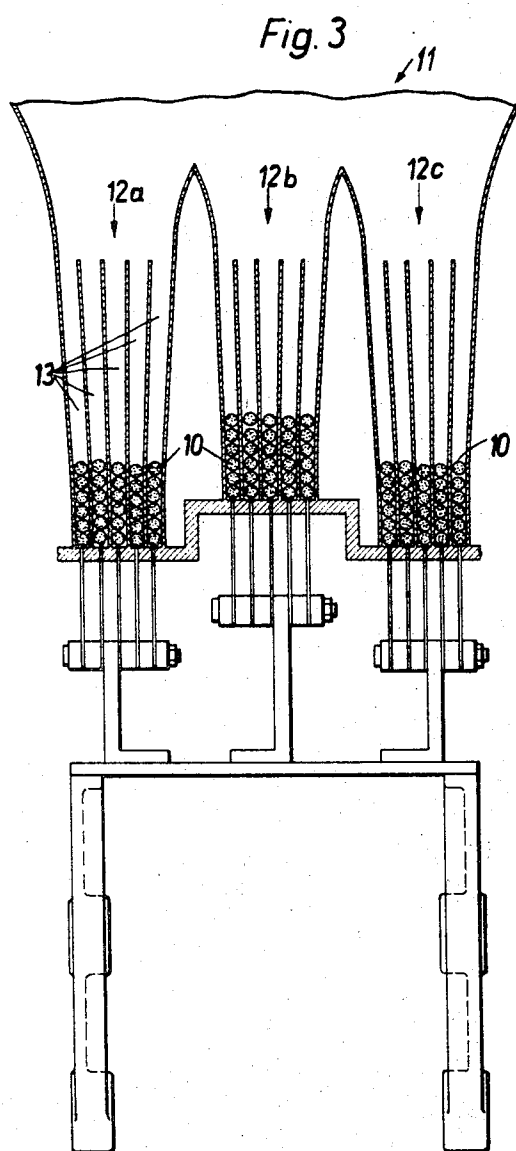
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DEVICE FOR FORMING A BATCH OF CIGARETTES

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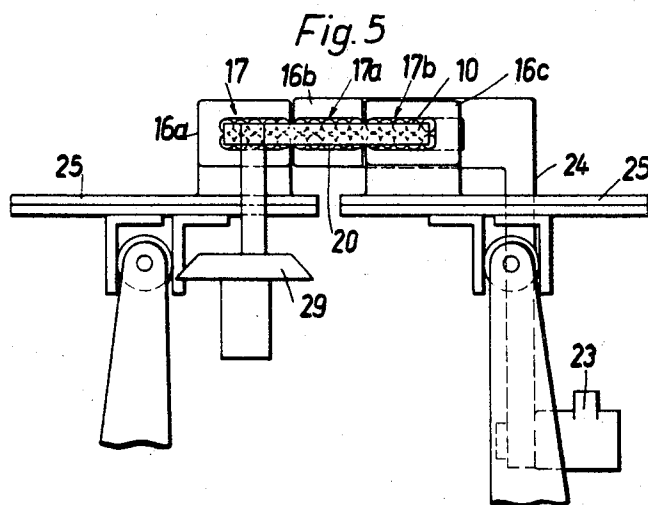
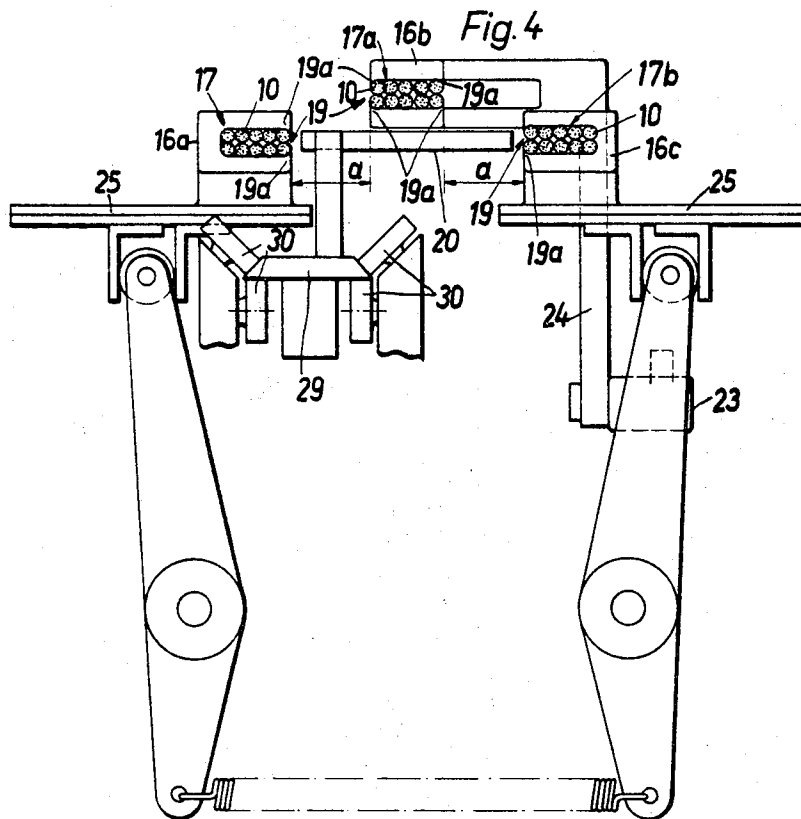
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DEVICE FOR FORMING A BATCH OF CIGARETTES

Filed Jan. 13, 1966

5 Sheets-Sheet 4



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DEVICE FOR FORMING A BATCH OF CIGARETTES

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Fig. 6

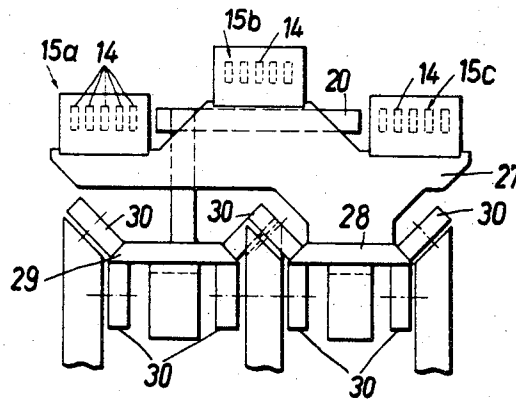
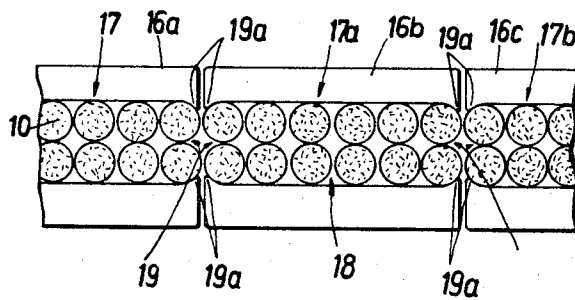


Fig. 7



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3,403,493

DEVICE FOR FORMING A BATCH OF CIGARETTES

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Claims priority, application Germany, Jan. 14, 1965,
F 44,964

10 Claims. (Cl. 53—151)

ABSTRACT OF THE DISCLOSURE

This provides a device for forming a batch of cigarettes to be packaged in a cigarette packing machine. The device includes at least two movable pockets held in spaced relationship with respect to each other. Means are provided to supply a quantity of cigarettes to each of the pockets which are subsequently placed side by side to engage each pocket at the open side thereof. This forms a continuous pocket containing a continuous batch of cigarettes. Means are provided to remove the batch of cigarettes from said continuous pocket so that it might be taken to a subsequent packing machine.

Background of the invention

Before the cigarettes can be packed, they have to be united to a batch of cigarettes. Known devices for forming batches of cigarettes use a so-called twist. Since the cigarettes are necessarily arranged in spaced relationship to reduce the frictional resistance, such twist serves to form a batch of cigarettes for a pack of cigarettes in which the cigarettes are closely packed. As is known, this is effected with the aid of radiately converging guide troughs, one for each individual cigarette. The cigarettes are at first removed from the hoppers of the magazine and pushed onto the guide troughs of the twist, by means of ejector bars. Since the guide troughs of the twist have to be relatively long to unobjectionably transfer the cigarettes into their correct positions, the ejector bars are immediately retracted when the cigarettes have entered the guide troughs of the twist, to avoid time losses and blocking the magazine. In the guide troughs, the cigarettes are further advanced by means of driver chains.

A considerable disadvantage of the known twist consists in that only one layer of cigarettes at a time can be fed into the batch position. Since the batches of cigarettes are normally formed of several superposed layers of cigarettes, it is necessary with the known twist to convey the individual layers successively and to adjust each time the level of the twist. This is undesirable because of the expenditure of time involved. A further disadvantage is that the structure of the twist occupies much space and is necessarily complicated due to the required driver chains.

Summary of the invention

An object of the present invention is to eliminate the aforementioned disadvantages by improving the known devices in such a manner as to increase the efficiency, reduce the required space to a minimum, and provide a relatively simple structure.

Another object of the present invention is to achieve that the cigarettes are precompressed when being formed to a batch of cigarettes.

The present invention provides a device for cigarette packing machines, for forming a batch of cigarettes for a pack of cigarettes out of individual cigarettes removed from a magazine which comprises at least two pockets held in spaced relationship to receive each a quantity of cigarettes of a batch of cigarettes, said pockets being mov-

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able, after having received said quantities of cigarettes, into an approached side-by-side arrangement engaging each other with open sides, thereby to form a batch of cigarettes of said individual quantities of cigarettes contained in said pockets in said approached side-by-side arrangement.

The basic idea of the invention thus consists in enabling the possibly multilayer batch of cigarettes for a pack of cigarettes to be subdivided into several likewise multilayer quantities and thus to be simultaneously conveyed and formed.

An essential advantage of the invention consists in that in the case of multilayer batches several layers of cigarettes can be simultaneously conveyed so that the batch of cigarettes can be formed at the same time. Thus it is no longer required, as in the known devices, to form the layers of cigarettes successively. This results in saving a considerable amount of time and in remarkably increasing the efficiency of the cigarette packing machine. Further advantages of the invention have to be seen in the space-saving structure of the device claimed, its simple design and functioning and in the fact that each formed batch of cigarettes is already in a precompressed state.

Conveniently, the device proposed by the invention may be provided with three pockets, of which the two outer pockets are open on one side and the central pocket is open on both sides, retaining edges on the open sides preventing the cigarettes introduced in several layers into the pockets from dropping out before the pockets are in an approached side-by-side arrangement in which they form a batch.

A common slide ejector may be provided for ejecting the batch of cigarettes from the aligned and contacting pockets into a receiving trough associated with the pockets. The batch of cigarettes which by now is completely formed and precompressed remains in the receiving trough for the further packing operation.

Another essential feature consists in that the central pocket or pockets are adjustable in height and arranged above the path of movement of the slide ejector and on a higher level than the outer pockets. This serves to render possible an unhindered return movement of the slide ejector after having ejected the cigarettes from the pockets into the receiving trough. To form a batch of cigarettes, the central pocket may be lowered to the level of the outer pockets so that when the pockets are in the approached side-by-side arrangement, the entire batch of cigarettes united in the cooperating pockets will be pushed out thereof by the slide ejector which passes through the pockets during this action. To avoid that the retraction of the slide ejector is interfered with by the central pocket, this is previously moved to a higher receiving level so that the retraction of the slide ejector may take place on a level below the central pocket.

Conveniently, groups of hoppers corresponding in number to the individual quantities of cigarettes to be introduced into the pockets are provided according to the invention, which can receive one or several layers of cigarettes. The hoppers are associated with groups of ejector bars having a cross-sectional area that is dimensioned according to the number of layers of cigarettes in the hoppers. The groups of ejector bars are suitably arranged for reciprocation on the common slide ejector which, analogously, is arranged on a carriage for ejecting the batches of cigarettes from the pockets in the approached side-by-side arrangement. Regarding the movability of the slide ejector and of the central pocket, a kinematic inversion might as well solve the problem, i.e. instead of the pocket it may also be the slide ejector which is made adjustable in height.

The invention not only resides in the individual features

claimed but also in the various possible combinations thereof.

Brief description of drawings

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:

FIG. 1 is a schematic top plan view of a device according to the invention;

FIG. 2 is a schematic side elevational view of the device shown in FIG. 1;

FIG. 3 is a sectional elevation, on an enlarged scale, of the hoppers of the device of FIGS. 1 and 2;

FIG. 4 is a section taken on the line IV—IV of FIG. 2;

FIG. 5 is a view similar to FIG. 4 but showing the pockets in approached side-by-side arrangement for forming a batch of cigarettes contained therein;

FIG. 6 is a schematic view of a detail of FIG. 4, particularly showing the arrangement of slide ejector and ejector bars, and

FIG. 7 is a fragmentary view, on an enlarged scale, of a detail of FIG. 5.

Description of specific embodiment

The device according to the invention is designed to be attached to a cigarette packing machine and serves to form a batch of cigarettes out of a number of cigarettes from a so-called magazine.

With reference now to the drawings, a magazine 11 (FIG. 3) is fed with cigarettes 10 in a known manner, not shown in detail. The magazine 11 is provided with individual groups 12a, 12b, 12c of vibrating hoppers 13 as shown in FIGS. 1 and 3. Each hopper 13 has an associated ejector bar 14. The ejector bars 14 are arranged in groups 15a, 15b, 15c corresponding to the groups 12a, 12b, 12c of hoppers 13. The cross-sectional area of the ejector bars 14 depends on the number of layers of cigarettes to be simultaneously ejected from the hoppers 13. As can be seen from FIG. 6, the ejector bars 14 of the illustrated embodiment are of a cross section in the form of an upright rectangle for ejecting two superposed layers of cigarettes.

As shown in FIGS. 4 and 5, pockets 16a, 16b, 16c receiving each a quantity 17a, 17b, 17c of cigarettes, respectively, are provided to form in cooperation a batch 18 (FIG. 7) of cigarettes. Before receiving the cigarettes 10, the pockets 16a, 16b and 16c are spaced apart from one another by a distance *a* and can be brought into approached side-by-side arrangement so as to contact each other with open sides 19 and thus to form a common hollow space for the batch of cigarettes formed of the individual quantities 17a, 17b and 17c. In order to prevent the cigarettes 10 from falling out of the open sides 19 of the pockets 16a, 16b and 16c while these are still spaced from one another, the open sides 19 are provided with retaining edges 19a, as illustrated particularly in FIG. 7.

A common slide ejector 20 is provided to eject the batch 18 of cigarettes 10 from the pockets 16a, 16b and 16c in the approached side-by-side arrangement of FIG. 5 into a receiving trough 21 (FIGS. 1 and 2), a plurality of which are caused to successively pass the pockets 16a, 16b and 16c in the direction of the arrow 22 or in opposite direction, respectively.

In cases in which more than two pockets are provided, as in the illustrated embodiment, either the common slide ejector or, as in the present embodiment, the central pocket or pockets are vertically adjustable to prevent collisions between the inner pocket or pockets and the slide ejector when this is moving back. For this purpose, as illustrated in FIG. 2, the central pocket 16b is vertically adjustable by means of parallelogram rods 23 through an arm 24. As shown in FIGS. 2 and 4, the two outer pockets 16a and 16c are mounted on horizontally displaceable carriages 25 to be moved toward, and away from, the central pocket 16b, i.e., in the positions of FIGS. 4 and 5, respectively.

For transferring the cigarettes 10 from the hoppers 13 into the pockets 16a, 16b and 16c, the central group 15b of the ejector bars 14 is arranged corresponding to the level of the central pocket 16b, at a higher level than the two outer groups 15a and 15c of ejector bars, as can be seen from FIGS. 2 and 4. For guiding the cigarettes 10 during their transfer from the individual groups 12a, 12b, 12c of the hoppers 13 into the pockets 16a, 16b, 16c a pair of converging guide rails 26 is associated with each of these groups, as illustrated in FIG. 1.

As can be seen from FIG. 6, the ejector bar groups 15a, 15b, 15c are mounted on a common ejector bar support 27 arranged for reciprocating movement on a carriage 28. The slide ejector 20 for ejecting the cigarettes from the pockets 16a, 16b, 16c is arranged on a slide carriage 29. The carriages 28 and 29 are each guided by stationarily mounted rollers 30. The mode of operation of the device is as follows:

The empty pockets 16a, 16b, 16c are ready to receive the cigarettes 10 in their position in which they are laterally spaced apart from one another by the distance *a* (FIG. 4). The central pocket 16b is positioned on a higher level than the two outer pockets 16a and 16c. The individual quantities 17a, 17b, 17c of cigarettes are simultaneously ejected from the individual groups 12a, 12b, 12c of hoppers 13 by means of the groups 15a, 15b, 15c of ejector bars 14 and introduced into the pockets 16a, 16b, 16c after having been crowded together a little by the pairs of guide rails 26. The ejector bar groups 15a, 15b, 15c then are retracted. The central pocket 16b is lowered to the level of the two outer pockets 16a and 16c, whereupon the latter are moved toward and in contact with the central pocket 16b to assume the approached side-by-side arrangement of FIG. 5. The three quantities 17a, 17b, 17c of cigarettes in the pockets 16a, 16b, 16c now form a batch 18 of cigarettes. This batch 18 is ejected by means of the slide ejector 20 and transferred into a receiving trough 21. The empty pockets 16a, 16b, 16c now return into their initial positions. The slide ejector 20 is returned into its initial position without interference by the central pocket 16b which by now has returned into its upper position above the slide ejector 20. The receiving troughs 21 are intermittently advanced by one trough so that again an empty receiving trough 21 is positioned in front of the pockets 16a, 16b, 16c.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

I claim:

1. A device for forming a batch of cigarettes to be packaged in a cigarette packing machine comprising:

- (a) at least two movable pockets held in spaced relationship with respect to each other, each pocket having at least one open side which is facing in a direction toward another pocket,
- (b) means supplying a quantity of cigarettes to fill said pockets,
- (c) means to engage said filled pockets at the said open sides to form a larger, single continuous pocket containing a continuous batch of cigarettes, and
- (d) means to remove said batch of cigarettes from said continuous pocket.

2. A device as defined in claim 1 wherein the said pockets are substantially rectilinear and movable in a horizontal direction, said pockets including retainer means at each open side thereof to contain cigarettes therein.

3. A device as defined in claim 2 wherein the inside

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height of said pockets corresponds substantially to the height of two or more superimposed cigarette layers.

4. A device as defined in claim 2 wherein the supply means includes hoppers containing cigarettes and ejector bars for pushing cigarettes from said hoppers into said pockets. 5

5. A device as defined in claim 2 wherein said removal means includes a main slide ejector to push said batch from the side-by-side engaged pockets.

6. A device as defined in claim 5 wherein said device comprises three pockets including two outer pockets and a central pocket, 10

said central pocket being open on each side facing an outer pocket,
said outer pockets being open on their side facing the central pocket. 15

7. A device as defined in claim 6 wherein the central pocket is adjustable in height and receives cigarettes during filling at a height above the path of movement for said main slide ejector and at a different level from said two outer pockets. 20

8. A device as defined in claim 2 wherein said supply means includes a chamber located before each of the pockets when said pockets are separated,

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each chamber having vertical partition walls forming hoppers which contain cigarettes to be supplied to the pockets,

the supply means further includes bar ejector means for pushing cigarettes from the hoppers into the said pockets.

9. A device as defined in claim 8 wherein the bottoms of the hoppers are disposed on the same level as the bottoms of the pockets when they are positioned to receive the cigarettes.

10. A device as defined in claim 9 wherein a series of bars is mounted on a common ejector support bar, a carriage means drives the ejector support bar, and pairs of converging guide rails are arranged between the hoppers and the said pockets.

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