

(19)



Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

EP 0 677 441 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

16.09.1998 Bulletin 1998/38

(51) Int. Cl.⁶: **B65B 19/10**

(21) Application number: **95105150.7**

(22) Date of filing: **06.04.1995**

(54) **Device for forming and feeding ordered groups of fragile rod-shaped objects, particularly cigarettes**

Vorrichtung zum Bilden und Zuführen von geordneten Gruppen von empfindlichen, stabförmigen Gegenständen, insbesondere Zigaretten

Dispositif pour la formation et l'alimentation de groupes rangés d'objets fragiles sous forme de tige, spécialement des cigarettes

(84) Designated Contracting States:
DE FR GB IT

(30) Priority: **15.04.1994 IT GE940048**

(43) Date of publication of application:
18.10.1995 Bulletin 1995/42

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Description

The invention relates to a device for forming and feeding ordered groups of fragile rod-shaped objects, particularly cigarettes, of the type comprising:

- means for forming a row of cigarettes, each row consisting of a predetermined number of cigarettes which are disposed directly adjacent to each other transversely with respect to their axes;
- at least two transfer stations, each for one row of cigarettes, each of these stations being associated with the means for forming the rows and the stations being disposed at a certain distance from each other and aligned transversely with respect to the axes of the cigarettes, while the rows of cigarettes in each transfer station are disposed so that they are staggered perpendicularly with respect to the stations and parallel to each other by an amount substantially equal at least to the diameter of the cigarettes between one transfer station and the next;
- a plurality of tubular housings open at one end at least and orientated parallel to each other and with their axes parallel to the axes of the cigarettes, these tubular housings being made to advance by predetermined steps transversely with respect to their axes and being brought one after another next to the transfer stations, in a position of axial insertion of the corresponding rows of cigarettes by transfer means and in which position the housings, the path of advance of the tubular housings being such that the row of cigarettes in each transfer station is positioned automatically with respect to the tubular housing in the position of superimposition on the row of cigarettes inserted at the preceding transfer station;
- guides for retaining the individual rows of cigarettes in the correct position of insertion into the tubular housings during the advance of the tubular housings from one transfer station to the next, until the housings have been completely filled, the said means interacting with the free side of the row of cigarettes in the tubular housing on which the next row of cigarettes is to be superimposed, and consisting of at least one stationary guide which extends along the path of advance of the tubular housings and is superimposed on the said free side of the terminal portion of at least one end of each cigarette of the row which projects beyond the corresponding end of the tubular housing, the housings being made with an axial length smaller than that of the cigarettes.

A device of this type is known from the document

GB-A-2.120.993. In this known device, the said guides are fixed in their operative position with respect to the conveyor belt and to the transfer stations. Since the cigarette packing machines of this kind generally operate at very high speeds, there is a considerable risk that the cigarettes of the rows inserted in the tubular housings in the first transfer stations may move and become disposed incorrectly, as a result of the rapid accelerations and decelerations. In this case, the cigarettes in the row inserted subsequently are inevitably damaged, causing a fall in output or an increase in wastage, and possibly necessitating the stopping of the machine to remove the damaged cigarettes.

The object of the invention is to provide a device according to the pre-characterizing part of claim 1, with which it is possible to avoid in a certain and extremely simple and economical way the disadvantages mentioned above, without restricting in any way the operating speed of the machine and without requiring additional moving parts which would have to be operated in synchronization with the remaining operating units of the machine, by rendering accessible the tubular housings, thus simplifying noticeably the operations for adjusting the alignment between the cigarettes in the transfer stations and the corresponding tubular housing.

The invention achieves the above object with a device of the type according to the preamble of claim 1 and characterized in that one or both guides are supported in a freely displaceable way from their operative positions with respect to the conveyor belt and to the stations.

According to a further improvement of the invention, one or both guides are hinged in an angularly displaceable way around an axis parallel to their longitudinal axis and in such a way as to be angularly raiseable away from their operative position, i.e. away from the conveyor belt.

Further improvements of the invention form the subject of the other dependent claims.

The particular characteristics of the invention, and the advantages derived therefrom, will be shown in greater detail by the description of a preferred embodiment of the invention, illustrated solely by way of example and without restriction in the attached drawings, in which:

Fig. 1 is a plan view from above of a device according to the invention.

Fig. 2 is a front view of the transfer stations and of the associated stationary retaining guide.

Fig. 3 is a front view of the stationary retaining guide at the ends of the tubular housings further from the transfer stations, the steps of the guide being shown in broken lines.

Fig. 4 is a schematic plan view from above of the

disposition of the two stationary retaining guides and of the transfer stations.

Figs. 5 to 9 are views in transverse section at different points of the retaining guides in which are shown the different stages of operation of the device.

Fig. 10 shows a lateral view of the device according to the invention in the direction of advance of the cassette conveyor.

The illustrated device relates in particular to a cigarette packing machine, in which the packets of cigarettes are formed by wrapping around a group of cigarettes, arranged in the same order as that of the cigarettes in the finished packet, the various layers of packaging material which form the packet.

The machine is therefore provided, before the operating units for the formation of the packet, with a device for forming ordered groups of cigarettes. The said device comprises a vertical feed hopper in which the individual cigarettes are housed and which has three channels 1, 1', 1'' for forming rows of cigarettes, these channels being known in themselves and each being capable of depositing a row of adjacent cigarettes with a predetermined number of cigarettes on a horizontal surface 2 in an associated transfer station S1, S1', S1''. The channels 1, 1', 1'' for forming rows of cigarettes are disposed at equal distances from each other and are aligned with each other transversely with respect to the axes of the cigarettes. The transfer surfaces 2 are made to be staggered parallel to each other at different heights, increasing by an amount substantially equal to the diameter of the cigarettes in the direction of advance of a continuous conveyor device which is provided with a plurality of tubular housings, known as a cassette belt. At each transfer station S1 to S1'', the rows of cigarettes are orientated parallel to each other. The cassette conveyor consists of a conveyor belt 3, whose upper conveyor section extends horizontally and before and parallel to the row of transfer stations S1, S1', S1''. The said belt 3 is run around pulleys 103, 203, at least one of which is rotated by a motor M and carries a plurality of tubular housings 4 which are distributed at equal distances from each other on the belt. The tubular housings 4 are open at their ends and are orientated with their axis transverse with respect to the conveyor belt 3 and parallel to the axes of the cigarettes in the transfer stations S1, S1', S1''. They have a rectangular transverse section capable of housing three superimposed rows of cigarettes. The upper section of the conveyor belt 3 extends at a level with respect to the transfer surfaces 2 such that at each transfer station S1, S1', S1'' the corresponding rows of cigarettes are provided at a level corresponding to that of the filling layer of the tubular housing 4 which the said row is intended to occupy at the time of insertion into the housing 4. The rows of

cigarettes are inserted by axial pushers 5 of a known type. The rows may advantageously be slightly compressed transversely with respect to their axes by opposing closing means 6 before their insertion, while the ends of the tubular housings 4 facing the transfer stations S1, S1', S1'' are suitably flared to facilitate entry. The conveyor belt 3 is made to advance in steps by which each tubular housing 4 is brought successively up to the next transfer station S1, S1', S1'', in the position of axial insertion of the corresponding row of cigarettes. The tubular housings 4 are also made shorter than the axial length of the cigarettes, at least on their vertical sides and on the upper side further from the belt 3, so that at the insertion position the cigarettes project beyond both ends of the said tubular housings 4. At the ends of the tubular housings 4 further from the transfer stations S1, S1', S1'' there is provided a first stationary guide 7 which consists of a shaped strip 7 suspended from above by two brackets 307. The brackets 307 are hinged at 407 to the frame of the device so that they can oscillate about a horizontal axis parallel to the stationary guide 7, enabling the guide to oscillate between a position lowered against the cassette belt and a position raised angularly away from the belt, so that the tubular housings 4 are easily accessible from the said end for manual servicing or maintenance operations.

As is also shown in Figs. 3 to 7, the said first stationary guide 7 has a profile widening by steps towards the facing end of the tubular housings on the side facing the tubular housings, and from the lower to the upper side of the guide 7. In particular, it has three steps, whose vertical sides 107, parallel to the ends of the cigarettes, form axial end stops for the introduction of the cigarettes and have heights substantially equal to or preferably slightly greater than the diameter of the cigarettes. The individual rows of cigarettes in each tubular housing are therefore disposed so that they are staggered axially with respect to each other according to the reciprocal axial staggering of the vertical sides 107 of the steps, while the horizontal sides 207 of the steps projecting towards the ends of the tubular housings 4 form horizontal surfaces which are superimposed with a suitable free space on the terminal portions at the facing ends of the cigarettes in the corresponding rows. Because of this arrangement, in the condition of partial filling of the tubular housings the corresponding rows of cigarettes are retained at least at one of their ends in their correct insertion position, preventing them from being displaced into positions such that they interfere with the rows of cigarettes which are introduced in a following transfer station with consequent damage to the product. Obviously, the horizontal projection of the steps in the axial direction, in other words of their horizontal sides 207, is such that the stationary guide 7 is sufficient spaced from the corresponding ends of the tubular housings 4.

In order to obtain a further retaining action on the ends of the cigarettes facing the transfer stations S1,

S1', S1'', a second retaining guide 8 is provided between the corresponding ends of the tubular housings 4 and the output end of the transfer stations, and is supported in a way similar to the first guide 7 and has similar functions to the first guide. At the insertion end of the tubular housings 4, the rows of cigarettes are staggered in the opposite way, the ends of the cigarettes in the upper layers projecting beyond those in the lower layers (Figs. 4 to 8). Consequently, as a result of what has been described previously, the guide 8 has a plurality of successive portions which extend from the up-line end of a transfer station S1, S1' to the up-line end of the following transfer station S1', S1'', while the portion of guide next to the final transfer station S1'' is made in such a way as to provide a vertical realignment of the rows of cigarettes in the tubular housings 4.

As shown in Figs. 2 and 4 to 8 in particular, each portion of the guide 8 has a horizontal superimposition surface 208, 208' at the free upper side of the ends of the cigarettes of the row inserted at the transfer station S1, S1' associated with the said portion. The horizontal superimposition surface 208, 208' of the individual guide segments are staggered vertically with respect to each other with steps in the direction of advance, corresponding to the associated rows of cigarettes. Similarly, the individual segments of the guide 8 have vertical guide surfaces 108, 108' interacting with the ends of the cigarettes which extend only between the down-line end of a transfer station S1, S1' and the up-line end of the following transfer station S1', S1'', and which are staggered with respect to each other with a step corresponding to the axial staggering of the row of cigarettes inserted in the tubular housings 4 at the transfer station S1, S1' directly up-line from the said surface 108, 108'. In this way, apertures 308 are formed next to the transfer stations S1, S1', S1''. The portions of guide 8 with the associated surfaces 108, 108' and 208, 208' interact only with the row of cigarettes inserted into the tubular housings 4 at the associated transfer station S1, S1', while the lower rows of cigarettes are free and are retained only by the action exerted on them by the cigarettes of the overlying rows.

According to a further characteristic shown in Figs. 4 to 7, in order to provide an action of retention of the corresponding lower row of cigarettes next to the transfer station S1', S1'' for the row of cigarettes directly superimposed on it, the transfer surfaces 2 are extended in the direction of the tubular housings 4 with superimposition blades 9 which terminate at a certain distance from the tubular housings, but are superimposed in a similar way to the horizontal surface 208, 208' of the preceding portion of guide 8 at the ends of the cigarettes of the row directly underlying the row to be inserted.

When, as in the case illustrated which is generally used in cigarette packing, the ordered group of cigarettes consists of three superimposed rows, in which each outer row has an identical number of cigarettes

while the intermediate row has one cigarette less and is disposed in a quincuncial arrangement with the other two, the thickness of the first two rows of cigarettes in the said disposition is less than twice the diameter of the cigarettes. Since the superimposition blade 9 prevents a quincuncial disposition of the intermediate row of cigarettes at least in the area of the corresponding ends (Figs. 6 and 7), the horizontal surface of the portion of guide 8 associated with the transfer station S1' of the said intermediate row and extending to the up-line end of the following transfer station S1'' for the third and final row of cigarettes has, as shown in Fig. 2, an initial horizontal portion provided at a level substantially equal to or slightly greater than twice the diameter of the cigarettes and a subsequent portion 208'' inclined slightly downwards, to compensate for the difference in thickness between the superimposed rows when the two rows are disposed in a quincuncial arrangement in the area between the two stations S1' and S1''.

This arrangement is not necessary for the segment of guide associated with the final transfer station S1'', since the insertion of the corresponding row completes the filling of the tubular housings 4 and the cigarettes retain each other in their correct position.

The guide 8 and the guide 7 also extend beyond the final transfer station S1'' for the final row of cigarettes to be inserted into the tubular housings 4. In this terminal portion, the guide 7 at the ends of the tubular housings 4 further from the transfer stations S1, S1', S1'' has a vertical surface 107'' which is aligned with the vertical surface of the elevation of the lowest step interacting with the lowest row of cigarettes projecting furthest from the tubular housing 4 (Figs. 4, 8 and 9). The said surface 107'' extends over the whole height of the tubular housings 4. The said terminal portion also has a horizontal surface 207'' which forms an extension of the horizontal surface 207 of the final uppermost step of the guide 7 and which extends over a length equal to the overall staggering of the rows with respect to each other. The corresponding terminal portion of the opposing guide 8, however, has a vertical surface 108'' which is inclined in the axial direction with respect to the cigarettes towards the opposing guide 7, the end next to the down-line end of the transfer station S1'' being spaced from the facing vertical surface 107'' of the opposing guide 7 by an amount corresponding to the length of the cigarettes plus the axial projection of the final uppermost row of cigarettes with respect to the lowest, while the downline end of the said inclined vertical surface 108'' is disposed at a distance from the opposing vertical surface 107'' substantially equal to or preferably slightly greater than the length of the cigarettes. Consequently, as shown in Figs. 4, 8 and 9, the passage of the tubular housings 4 between the two terminal portions of the two opposing guides 7 and 8 causes the progressive vertical alignment of the ends of the cigarettes with each other, thus removing the axial staggering produced at the stage of progressive filling of the tubular

housings 4. The said terminal portion of the guide 8 also has a horizontal superimposition surface 208" at the ends of the cigarettes of the final uppermost row inserted at the said final station S1", in a similar way to the portions of the said guide provided up-line.

The guides 7 and 8 being both supported by the pivotable brackets 307 and 408 can be raised angularly away from the conveyor belt 3. In the raised position the cigarettes in the stations S1, S1', S1" and the facing sides of the tubular housings 4 can be directly seen, thus simplifying noticeably the operations for adjusting the alignment between the cigarettes in the stations S1, S1' and S1" and the corresponding tubular housing 4.

According to a further improvement of the invention, as shown in figures 1 and 10, the guides 7 and 8, i.e. the brackets 307, 408 are freely pivotable and the guides 7, 8 provided in combination with means for detecting the angular displacement of the same ones.

Detecting means of any suitable kind can be applied, in the embodiment of figures 1 and 10 the guides 7 and 8 are associated to electro-optical displacement detectors which are formed by an integrated light beam emitter/receiver unit 10 which is supported by a stationary part of the frame 11 and which is oriented with the axis of the emitted beam parallel to the longitudinal axis of the corresponding guide 7 and 8 facing the emitter/receiver unit 10. The reflectors 12 have a reflecting surface which is transversal to the emitted beam and to the longitudinal axis of the guides 7, 8. This surface shows a hole 112 being placed in such a way that in the operative position of the guides 7 and 8 it is coaxial to the emitted beam which passes through it without being reflected. An angular displacement of the guides 7, 8 causes a displacement of the hole 112 with respect to the emitted beam which falls onto the reflecting surface around the hole 112. The emitter/receiver unit 10 generates a control signal which can be fed to a central control unit for example for stopping the machine or at least the pushers 5 and perhaps also the belt 3.

The above described combination results noticeably advantageous in the eventuality of cigarettes jam during transfer from the stations S1, S1', S1" to the tubular housings 4. Occurring a cigarette jam, the freely angularly displaceable guides 7 and 8 will be raised by the jammed cigarettes material compressed, for example, in the passages under the superimposition horizontal surfaces 208, 208', 208" of the guide 8 or against the surfaces 107, 207 of the opposite guide 7. The signal generated by the emitter/receiver unit 10 leads to an immediate machine stop command. This procedure for stopping the machine takes place in a fraction of the time normally needed by a person to even only to realize a jam has occurred. The rapidity in stopping the machine or at least the pushers has a great importance in order to avoid damaging of the operational organs and devices which might be caused by the continuous progressive compression of successive cigarettes on the jammed ones between the stations and the tubular

housings forming a very compact obstacle.

Claims

1. Device for forming and feeding ordered groups of fragile rod-shaped objects, particularly cigarettes, of the type comprising:
 - means (1, 1', 1", 2) for forming a row of cigarettes, each row consisting of a predetermined number of cigarettes which are disposed directly adjacent to each other transversely with respect to their axes;
 - at least two transfer stations (S1, S1', S1"), each for one row of cigarettes, each of these stations being associated with the means (1, 1', 1", 2) for forming the rows and the stations (S1, S1', S1") being disposed at a certain distance from each other and aligned transversely with respect to the axes of the cigarettes, while the rows of cigarettes in each transfer station (S1, S1', S1") are disposed so that they are staggered perpendicularly with respect to the stations and parallel to each other by an amount substantially equal at least to the diameter of the cigarettes between one transfer station (S1, S1') and the next (S1', S1");
 - a plurality of tubular housings (4) open at one end at least and orientated parallel to each other and with their axes parallel to the axes of the cigarettes, these tubular housings (4) being made to advance by predetermined steps transversely with respect to their axes and being brought one after another next to the transfer stations (S1, S1', S1"), in a position of axial insertion of the corresponding rows of cigarettes by transfer means (5) and in which position the housings, the path of advance of the tubular housings being such that the row of cigarettes in each transfer station (S1, S1', S1") is positioned automatically with respect to the tubular housing (4) in the position of superimposition on the row of cigarettes inserted at the preceding transfer station (S1, S1', S1");
 - guides (7, 8) for retaining the individual rows of cigarettes in the correct position of insertion into the tubular housings (4) during the advance of the tubular housings (4) from one transfer station (S1, S1') to the next (S1', S1"), at least until the housings have been completely filled, the said guides (7, 8) interacting with the free side of the row of cigarettes in the tubular housing (4) on which the next row of cigarettes is to be superimposed, and consisting of at least one stationary guide surface

- (207, 207'; 208, 208', 208'', 208''') which extends along the path of advance of the tubular housings (4) and is superimposed on the said free side of the terminal portion of at least one end of each cigarette of the row which projects beyond the corresponding end of the tubular housing (4), the housings being made with an axial length smaller than that of the cigarettes, characterized in that the one or both the guides (7, 8) are supported (307, 408) in a freely displaceable way from their operative positions with respect to the conveyor belt (3) and to the stations (S1, S1', S1'').
2. Device according to claim 1, characterized in that one or both the guides (7, 8) are hinged (307, 408) in an angularly displaceable way around an axis parallel to their longitudinal axis and in such a way as to be angularly raiseable away from their operative position, i.e. away from the conveyor belt (3).
 3. Device according to claims 1 or 2, characterized in that one or both the guides (7, 8) are supported (307, 408) in a freely angularly displaceable way, means being provided (10, 12) for detecting an angular displacement of one or both the guides (7, 8).
 4. Device according to claim 3, characterized in that the angular displacement detecting means (10, 12) are connected to a central control unit generating a stop command for the machine or at least of the transfer means (5) and perhaps of the cassette conveyor (3, 4) when an angular displacement signal is emitted by the detector (10, 12).
 5. Device according to one or more of the preceding claims, characterized in that the superimposed rows of cigarettes are inserted into the corresponding tubular housing (4) so that they are staggered axially with respect to each other, in such a way that at one end of the housing (4) the ends of the cigarettes of the underlying rows project beyond the ends of the cigarettes of the upper rows, while the displaceable retaining guide (7) is made with corresponding steps which form transverse stop surfaces (107) interacting with the ends of the cigarettes and surfaces for superimposition (207) on the projecting terminal portions of the cigarettes in each row, each of these surfaces interacting with one of the rows of cigarettes over the whole path of the tubular housings (4) from the first to the final transfer station (S1, S1', S1''), while means (107'', 108'') are provided down-line from the final transfer station (S1'') to align the individual rows of cigarettes in the tubular housings with each other in the transverse direction with respect to the axes of the cigarettes.
 6. Device according to one or more of the preceding claims, characterized in that the tubular housings (4) are open at both ends and there is provided a displaceable guide (8) interacting also with the ends of the cigarettes projecting from the other ends of the tubular housings, the displaceable retaining guide (8) on the ends of the tubular housings (4) facing the transfer stations being provided with apertures (308) next to the stations for the passage of the rows of cigarettes.
 7. Device according to one or more of the preceding claims, characterized in that the axial staggering of the superimposed rows of cigarettes is done in such a way that the ends of the cigarettes in the underlying rows project beyond those in the upper rows, at the ends of the tubular housings (4) further from the transfer stations (S1, S1', S1''), while at the ends facing the stations the opposite disposition is found, with the ends of the cigarettes in the upper rows projecting beyond the ends of those in the underlying rows, the displaceable retaining guide (7) at the ends of the tubular housings (4) further from the transfer stations (S1, S1', S1'') being made with continuous steps according to the axial staggering and the specified number of rows in the tubular housings (4), while the displaceable retaining guide (8) at the ends facing the transfer stations (S1, S1', S1'') is provided with a superimposition surface (208, 208', 208'', 208''') which engages, in succession according to the advance of the tubular housings (4) from an up-line station (S1, S1') to one (S1', S1'') immediately after it, only the row of cigarettes inserted at the said up-line transfer station, terminating at the up-line end of the following transfer station (S1', S1''), the said superimposition surface (208, 208', 208'', 208''') being staggered by a step corresponding to the row of cigarettes inserted in the tubular housings (4), in the direction of advance of the housings, while the lower rows of cigarettes are retained only by those of the rows superimposed on them.
 8. Device according to one or more of the preceding claims, characterized in that the opposed displaceable guides (7, 8) also have surfaces (107, 108, 108') which are transverse with respect to the axes of the cigarettes, along which the ends of the cigarettes slide, and which are spaced apart in the axial direction with respect to the cigarettes by an amount substantially equal to or slightly greater than the length of the cigarettes, the said surfaces corresponding to the elevations of the steps of the displaceable retaining guide (7) at the ends of the tubular housings further from the transfer stations, while the displaceable retaining guide (8) at the ends of the tubular housings (4) facing the transfer stations (S1, S1', S1'') has segments of transverse

surface (108, 108'), each located between one transfer station (S1, S1') and the next (S1', S1'') and staggered axially by a step with respect to the up-line segment by an amount corresponding to the axial staggering of the rows of cigarettes, while the remaining underlying rows of cigarettes inserted in the preceding transfer stations (S1, S1') are axially free.

9. Device according to one or more of the preceding claims, characterized in that the opposed guides (7, 8) have terminal portions extending beyond the final transfer station for the final row of cigarettes to be inserted into the tubular housings (4), the guide (7) at the ends further from the transfer stations (S1, S1', S1'') being provided with a transverse surface (107'') which is aligned with the transverse surface (107) of the step associated with the rows of cigarettes projecting furthest from the associated ends of the tubular housings (4), while the opposing guide (8) is provided with a transverse wall (108'') which is inclined towards the opposing guide (7) in a way corresponding to the staggering of the final rows of cigarettes inserted into the tubular housings (4) at the final transfer station (S1''), both transverse walls extending over the whole section of the tubular housings (4).
10. Device according to Claim 9, characterized in that the terminal portions of the guides (7, 8) beyond the final transfer station (S1'') is provided with a superimposition surface (207'', 208'') only at the corresponding ends of the cigarettes of the final row inserted into the said final transfer station (S1'').
11. Device according to one or more of the preceding claims, characterized in that at the apertures (308) for the passage of the rows of cigarettes in the guide (8) on the side of the transfer stations (S1', S1''), particularly after the first transfer station (S1), there is provided a superimposition blade (9) at the ends of the cigarettes facing the said transfer station (S1', S1'') of the row of cigarettes inserted at the preceding transfer station, this superimposition blade (9) being mounted so that it projects towards the tubular housings (4) from a supporting member (2), in other words a transfer surface provided at the said station, and extends flush with the transfer surface (2), and substantially flush with the vertical superimposition surface (208, 208') of the portion of guide (8) between the said transfer station (S1'', S1') and the preceding transfer station (S1', S1) which is interrupted by the aperture (308).
12. Device according to Claim 11, characterized in that there are inserted into the tubular housing at least two and preferably three rows of cigarettes, one superimposed on another, one row, preferably the

intermediate, being disposed in a quincuncial arrangement with the immediately underlying row, and a superimposition blade (9) being provided which is interposed between the ends of the underlying row of cigarettes and the ends of the overlying row of cigarettes, while the superimposition surface of the guide (8) for the said quincuncial row is provided with an initial portion at the transfer station (S1', S1'') which is superimposed on the row of cigarettes not in the quincuncial position, and with a subsequent terminal portion (208'') inclined progressively towards the row of cigarettes interacting with it, by an amount corresponding to the difference between the non-quincuncial and the quincuncial disposition.

13. Device according to one or more of the preceding claims, characterized in that the transfer surfaces (2) of the rows of cigarettes are disposed horizontally and are staggered by a height corresponding to the difference of substantially one diameter of a cigarette between one transfer station (S1, S1') and the next (S1', S1''), while the tubular housings (4) are carried by a continuous conveyor belt (3) whose upper horizontal section is placed at a level such that each row of cigarettes on the corresponding transfer surface (2) is automatically placed at the height of the position which it takes up in the tubular housing at the time of insertion, the superimposition surfaces (207, 207') and (208, 208', 208'') of the guides (7, 8) being horizontal and the transverse surfaces (107, 107'', 108, 108', 108'') being vertical.

Patentansprüche

1. Vorrichtung zum Bilden und Zuführen von geordneten Gruppen von empfindlichen, stabförmigen Gegenständen, insbesondere Zigaretten, vom Typ mit:
 - Mitteln (1, 1', 1'', 2) zum Bilden einer Reihe von Zigaretten, wobei jede Reihe aus einer vorbestimmten Anzahl von Zigaretten besteht, die direkt nebeneinander quer bezüglich ihrer Achsen angeordnet sind;
 - mindestens zwei Transferstationen (S1, S1', S1''), jede für eine Zigarettenreihe, wobei jede dieser Stationen Mitteln (1, 1', 1'', 2) zum Bilden von Reihen zugeordnet ist und die Stationen (S1, S1', S1'') in einem bestimmten Abstand voneinander angeordnet und quer bezüglich der Zigarettenachsen ausgerichtet sind, während die Zigarettenreihen in jeder Transferstation (S1, S1', S1'') so angeordnet sind, daß sie senkrecht bezüglich der Stationen und parallel zueinander um einen Betrag versetzt sind, der im wesentlichen mindestens gleich dem Durchmesser der Zigaretten zwi-

schen einer Transferstation (S1, S1') und der nächsten (S1', S1'') ist;

- einer Vielzahl von rohrförmigen Gehäusen (4), die mindestens an einem Ende offen sind und parallel zueinander und mit ihren Achsen parallel zu den Achsen der Zigaretten ausgerichtet sind, wobei diese rohrförmigen Gehäuse (4) so hergestellt sind, daß sie durch vorbestimmte Schritte quer bezüglich ihrer Achsen vorrücken und nacheinander ganz nahe zu den Transferstationen (S1, S1', S1'') in eine axiale Einführposition der entsprechenden Zigarettenreihen durch Transfermittel (5) gebracht werden und wobei in dieser Position die Gehäuse und der Vorrückweg der rohrförmigen Gehäuse derart sind, daß die Zigarettenreihe in jeder Transferstation (S1, S1', S1'') automatisch bezüglich des rohrförmigen Gehäuses (4) in der Überlagerungsposition auf der Zigarettenreihe angeordnet wird, die an der vorhergehenden Transferstation (S1, S1', S1'') eingeführt wurde;
 - Führungen (7, 8) zum Zurückhalten der einzelnen Zigarettenreihen in der korrekten Einführposition in die rohrförmigen Gehäuse (4) während des Vorrückens der rohrförmigen Gehäuse (4) von einer Transferstation (S1, S1') zu der nächsten (S1', S1''), mindestens bis die Gehäuse vollständig gefüllt wurden, wobei die Führungen (7, 8) mit den freien Seiten der Zigarettenreihe in dem rohrförmigen Gehäuse (4) zusammenwirken, worüber die nächste Zigarettenreihe angeordnet werden soll, und wobei die Führungen aus mindestens einer stationären Führungsoberfläche (207, 207'; 208, 208', 208'', 208''') bestehen, die sich entlang des Vorrückweges der rohrförmigen Gehäuse (4) erstreckt und über der freien Seite des Endteiles mindestens eines Endes jeder Zigarette der Reihe angeordnet ist, die über das entsprechende Ende des rohrförmigen Gehäuses (4) hinausragt, wobei die Gehäuse mit einer geringeren axialen Länge als die der Zigaretten hergestellt sind, dadurch gekennzeichnet, daß die eine oder beide Führungen (7, 8) aus ihren Betriebspositionen bezüglich des Förderbandes (3) und der Stationen (S1, S1', S1'') frei verschiebbar gestützt (307, 408) sind.
2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß eine oder beide Führungen (7, 8) auf winkelig verschiebbare Weise um eine Achse parallel zu ihrer Längsachse und derart angelenkt (307, 408) sind, daß sie winkelig aus ihrer Betriebsposition, d.h. von dem Förderband (3) weg, anhebbar sind.
 3. Vorrichtung nach Anspruch 1 oder 2, dadurch

gekennzeichnet, daß eine oder beide Führungen (7, 8) in frei winkelig verschiebbarer Weise gestützt (307, 408) sind, wobei Mittel (10, 12) zum Erfassen einer Winkelverschiebung einer oder beider Führungen (7, 8) vorgesehen sind.

4. Vorrichtung nach Anspruch 3, dadurch gekennzeichnet, daß die Erfassungsmittel (10, 12) für die Winkelverschiebung mit einer zentralen Steuereinheit verbunden sind, die einen Anhaltebefehl für die Maschine oder wenigstens der Transfermittel (5) und eventuell des Kassettenförderers (3, 4) erzeugt, wenn ein Winkelverschiebungssignal durch den Detektor (10, 12) gesendet wird.
5. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die übereinandergelagerten Zigarettenreihen in das entsprechende rohrförmige Gehäuse (4) so eingeführt werden, daß sie axial zueinander derart versetzt sind, daß an einem Ende des Gehäuses (4) die Zigarettenenden der darunterliegenden Reihen über die Zigarettenenden der oberen Reihen hinausragen, während die verschiebbare Rückhalteführung (7) mit entsprechenden Stufen hergestellt ist, die Querschlagoberflächen (107) bilden, welche mit den Zigarettenenden und den Oberflächen für die Überlagerung (207) auf den hinausragenden Endteilen der Zigaretten in jeder Reihe in Wechselwirkung treten, wobei jede dieser Oberflächen mit einer der Zigarettenreihen über den gesamten Weg der rohrförmigen Gehäuse (4) von der ersten zu der letzten Transferstation (S1, S1', S1'') in Wechselwirkung tritt, während Mittel (107'', 108'') abwärts von der letzten Transferstation (S1'') vorgesehen sind, um die einzelnen Zigarettenreihen in den rohrförmigen Gehäusen zueinander in der Querrichtung bezüglich der Zigarettenachsen auszurichten.
6. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die rohrförmigen Gehäuse (4) an beiden Enden offen sind und daß eine verschiebbare Führung (8) vorgesehen ist, die auch mit den Zigarettenenden in Wechselwirkung tritt, die von den anderen Enden der rohrförmigen Gehäuse hervorragen, wobei die verschiebbare Rückhalteführung (8) auf den Enden der rohrförmigen Gehäuse (4), welche den Transferstationen zugekehrt sind, mit Öffnungen (308) ganz nahe den Stationen für den Durchgang der Zigarettenreihen versehen sind.
7. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das axiale Versetzen der übereinander angeordneten Zigarettenreihen derart geschieht, daß die Zigarettenenden in den darunterliegenden Rei-

hen an den Enden der rohrförmigen Gehäuse (4) weiter weg von den Transferstationen (S1, S1', S1'') über die Enden in den oberen Reihen hinausragen, während man an den den Stationen zugekehrten Enden die entgegengesetzte Anordnung findet, wobei die Zigarettenenden in den oberen Reihen über die Enden jener in den darunter liegenden Reihen hervorragen, wobei die verschiebbare Rückhalteführung (7) an den Enden der rohrförmigen Gehäuse (4) weiter weg von den Transferstationen (S1, S1', S1'') mit fortlaufenden Stufen entsprechend der axialen Versetzung und der vorgeschriebenen Anzahl der Reihen in den rohrförmigen Gehäusen (4) hergestellt ist, während die verschiebbare Rückhalteführung (8) an den den Transferstationen (S1, S1', S1'') zugekehrten Enden mit einer Überlagerungsoberfläche (208, 208', 208'', 208''') versehen ist, die nacheinander entsprechend dem Vorrücken der rohrförmigen Gehäuse (4) von einer aufstromigen Station (S1, S1') zu einer (S1', S1'') unmittelbar nach dieser nur mit der Zigarettenreihe in Eingriff kommt, die an der aufstromigen Transferstation eingeführt ist, wobei sie an dem aufstromigen Ende der folgenden Transferstation (S1', S1'') endet und die Überlagerungsoberfläche (208, 208', 208'', 208''') durch eine Stufe versetzt wird, welche der Zigarettenreihe entspricht, die in die rohrförmigen Gehäuse (4) in der Vorrückbewegung der Gehäuse eingeführt wurde, während die unteren Zigarettenreihen nur durch diejenigen Reihen zurückgehalten werden, die auf ihnen angeordnet sind.

8. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die entgegengesetzten verschiebbaren Führungen (7, 8) auch Oberflächen (107, 108, 108') haben, welche sich quer bezüglich der Zigarettenachsen, entlang welchen die Zigarettenenden gleiten, befinden und die in axialer Richtung bezüglich der Zigaretten um einen Betrag im Abstand gehalten sind, der im wesentlichen gleich oder etwas größer als die Länge der Zigaretten ist, wobei die Oberflächen den Erhebungen der Stufen der verschiebbaren Rückhalteführung (7) an den Enden der rohrförmigen Gehäuse weiter weg von den Transferstationen entsprechen, während die verschiebbare Rückhalteführung (8) an den Enden der rohrförmigen Gehäuse (4), welche den Transferstationen (S1, S1', S1'') zugekehrt sind, Segmente einer Queroberfläche (108, 108') hat, von denen jede zwischen einer Transferstation (S1, S1') und der nächsten (S1', S1'') angeordnet und axial durch eine Stufe bezüglich des aufstromigen Segmentes um einen Betrag versetzt wird, welcher der axialen Verschiebung der Zigarettenreihen entspricht, während die verbleibenden, darunter liegenden Zigarettenreihen, welche in den vorhergehenden

Transferstationen (S1, S1') eingeführt sind, axial frei sind.

9. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die entgegengesetzten Führungen (7, 8) Endteile haben, die sich über die letzte Transferstation für die letzte Zigarettenreihe erstrecken, damit die letzte Zigarettenreihe in die rohrförmigen Gehäuse (4) eingeführt werden kann, wobei die Führung (7) an den Enden weiter weg von den Transferstationen (S1, S1', S1'') mit einer Queroberfläche (107'') versehen ist, die mit der Queroberfläche (107) der Stufe ausgerichtet ist, die den Zigarettenreihen zugeordnet ist, welche am weitesten von den zugeordneten Enden der rohrförmigen Gehäuse (4) hervorragen, während die entgegengesetzte Führung (8) mit einer Querwand (108'') versehen ist, die gegen die entgegengesetzte Führung (7) in einer Weise geneigt ist, welche dem Versetzen der letzten Zigarettenreihen entspricht, welche in die rohrförmigen Gehäuse (4) an der letzten Transferstation (S1'') eingeführt sind, wobei sich beide Querwände über den ganzen Abschnitt der rohrförmigen Gehäuse (4) erstrecken.
10. Vorrichtung nach Anspruch 9, dadurch gekennzeichnet, daß die Endteile der Führungen (7, 8) über der letzten Transferstation (S1'') mit einer Überlagerungsoberfläche (207'', 208'') nur an den entsprechenden Zigarettenenden der letzten Reihe versehen sind, welche in die letzte Transferstation (S1'') eingeführt werden.
11. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß an den Öffnungen (308) für den Durchgang der Zigarettenreihen in der Führung (8) auf der Seite der Transferstationen (S1', S1''), insbesondere nach der ersten Transferstation (S1), eine Überlagerungsklinge (9) an den Zigarettenenden geschaffen ist, welche der Transferstation (S1', S1'') der Zigarettenreihe zugekehrt ist, die an der vorhergehenden Transferstation eingeführt wurde, wobei diese Überlagerungsklinge (9) so befestigt ist, daß sie gegen die rohrförmigen Gehäuse (4) von einem Stütze (2) hervorragt, mit anderen Worten einer an der Station vorgesehenen Transferoberfläche, und sich bündig mit der Transferoberfläche (2) und im wesentlichen bündig mit der vertikalen Überlagerungsoberfläche (208, 208') des Teiles der Führung (8) zwischen der Transferstation (S1'', S1') und der vorhergehenden Transferstation (S1', S1), welche durch die Öffnung (308) unterbrochen wird, erstreckt.
12. Vorrichtung nach Anspruch 11, dadurch gekennzeichnet, daß in das rohrförmige Gehäuse minde-

stens zwei und vorzugsweise drei Zigarettenreihen eingeführt werden, eine über der anderen angeordnet, wobei eine Reihe, vorzugsweise die mittlere, in einer quincunxialen Anordnung mit der unmittelbar darunter liegenden Reihe angeordnet ist und wobei eine Überlagerungsklinge (9) vorgesehen ist, die zwischen den Enden der darunterliegenden Zigarettenreihe und den Enden der darüberliegenden Zigarettenreihe angeordnet ist, während die Überlagerungsoberfläche der Führung (8) für die quincunxiale Reihe mit einem Anfangsteil an der Transferstation (S1', S1'') versehen ist, das auf der Zigarettenreihe in der nicht quincunxialen Position angeordnet ist, und mit einem darauffolgenden Endteil (208'') versehen ist, das allmählich gegen die damit zusammenwirkende Zigarettenreihe um einen Betrag geneigt ist, welcher der Differenz zwischen der nicht-quincunxialen und der quincunxialen Anordnung entspricht.

13. Vorrichtung nach einem oder mehreren der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß die Transferoberflächen (2) der Zigarettenreihen horizontal angeordnet und um eine Höhe versetzt sind, welche der Differenz von im wesentlichen einem Durchmesser einer Zigarette zwischen einer Transferstation (S1, S1') und der nächsten (S1', S1'') entspricht, während die rohrförmigen Gehäuse (4) durch ein Endlosförderband (3) getragen werden, dessen oberer, horizontaler Abschnitt auf einer Höhe derart angeordnet ist, daß jede Zigarettenreihe auf der entsprechenden Transferoberfläche (2) automatisch auf der Höhe der Position angeordnet wird, welche sie in dem rohrförmigen Gehäuse zur Zeit der Einführung einnimmt, wobei die Überlagerungsoberflächen (207, 207') und (208, 208', 208'') der Führungen (7, 8) horizontal und die Queroberflächen (107, 107'', 108, 108', 108'') vertikal sind.

Revendications

1. Dispositif pour former des groupes ordonnés d'objets fragiles en forme de tige et destiné à alimenter en groupes ordonnés d'objets fragiles en forme de tige, notamment des cigarettes, du genre comportant :
- des moyens (1, 1', 1'', 2) destinés à former une rangée de cigarettes, chaque rangée étant constituée d'un nombre déterminé à l'avance de cigarettes qui sont disposées directement adjacentes l'une à l'autre transversalement par rapport à leurs axes ;
 - au moins deux postes (S1, S1', S1'') de transfert, chacun pour une rangée de cigarettes, chacun de ces postes étant associé aux moyens (1, 1', 1'', 2) destinés à former les ran-

gées et les postes (S1, S1', S1'') étant disposés à une certaine distance les uns des autres et étant alignés transversalement par rapport aux axes des cigarettes, tandis que les rangées de cigarettes dans chaque poste (S1, S1', S1'') de transfert sont disposées de sorte qu'elles sont disposées en quinconce perpendiculairement par rapport au poste et parallèlement les unes aux autres d'une quantité sensiblement égale à au moins le diamètre des cigarettes entre un poste (S1, S1') de transfert et le suivant (S1', S1'');

- une pluralité de logements (4) tubulaires ouverts à une extrémité au moins et orientés parallèlement les uns aux autres et ayant leurs axes parallèles aux axes des cigarettes, ces logements (4) tubulaires étant avancés par étapes déterminées à l'avance transversalement par rapport à leur axe et étant amenées l'un après l'autre à proximité des postes (S1, S1', S1'') de transfert, dans une position d'insertion axiale des rangées correspondantes de cigarettes par les moyens (5) de transfert, le trajet d'avance des logements tubulaires étant tel que la rangée de cigarettes dans chaque poste (S1, S1', S1'') de transfert est positionnée automatiquement par rapport aux logements (4) tubulaires dans la position de superposition sur la rangée des cigarettes insérée au poste (S1, S1', S1'') de transfert précédent;
- des guides (7, 8) destinés à maintenir les rangées individuelles de cigarettes dans la position d'insertion correcte dans les logements (4) tubulaires pendant l'avance des logements (4) tubulaires à partir d'un poste (S1, S1') de transfert au suivant (S1', S1''), au moins jusqu'à ce que les logements aient été complètement remplis, les guides (7, 8) coopérant avec le côté libre de la rangée des cigarettes dans le logement (4) tubulaire sur lequel la rangée suivante des cigarettes doit être superposée, et étant constitués d'au moins une surface (207, 207', 208, 208'', 208'', 208''') de guidage stationnaire qui s'étend le long du trajet d'avance des logements (4) tubulaires et est superposée sur le côté libre de la partie terminale d'au moins une extrémité de chaque cigarette de la rangée qui fait saillie au-delà de l'extrémité correspondante du logement (4) tubulaire, les logements ayant une longueur axiale plus petite que celle des cigarettes, caractérisé en ce que l'un ou les deux guides (7, 8) sont supportés (307, 408) d'une manière librement déplaçable à partir de leur position de fonctionnement par rapport à la courroie (3) de convoyage et aux postes (S1, S1', S1'').

2. Dispositif suivant la revendication 1, caractérisé en

ce que l'un ou les deux guides (7, 8) sont articulés (307, 408) d'une manière déplaçable angulairement par rapport à un axe parallèle à leur axe longitudinal et d'une manière telle qu'ils peuvent être soulevés angulairement de manière à s'éloigner de leur position de fonctionnement, c'est-à-dire en s'éloignant de la courroie (3) de convoyage.

3. Dispositif suivant la revendication 1 ou 2, caractérisé en ce que l'un ou les deux guides (7, 8) sont supportés (307, 408) d'une manière qui peut être déplacée angulairement librement, des moyens (10, 12) étant prévus pour détecter un déplacement angulaire de l'un ou des deux guides (7, 8).

4. Dispositif suivant la revendication 3, caractérisé en ce que les moyens (10, 12) de détection de déplacement angulaire sont reliés à une unité de commande centrale produisant une instruction d'arrêt pour la machine ou au moins pour les moyens (5) de transfert et peut-être pour le convoyeur (3, 4) à cassette lorsqu'un signal de déplacement angulaire est émis par le capteur (10, 12).

5. Dispositif suivant l'une ou plusieurs des revendications précédentes, caractérisé en ce que les rangées superposées de cigarettes sont insérées dans les logements (4) tubulaires correspondants de manière à être en quinconce axialement les uns par rapport aux autres, de telle manière qu'à une extrémité du logement (4) les extrémités des cigarettes de la rangée sous-jacente font saillie au-delà des extrémités des cigarettes des rangées supérieures, tandis que le guide (7) de maintien déplaçable est réalisé à partir de gradins correspondants qui forment des surfaces (107) d'arrêt transversales coopérant avec les extrémités des cigarettes et des surfaces pour la superposition (207) sur les parties terminales faisant saillie des cigarettes dans chaque rangée, chacune des surfaces coopérant avec l'une des rangées de cigarettes sur l'ensemble du trajet du logement (4) tubulaire à partir du premier poste de transfert jusqu'au poste (S, S1', S1'') de transfert final, tandis que des moyens (107'', 108'') sont prévus en aval de la ligne à partir du poste (S1'') de transfert final pour aligner les rangées individuelles de cigarettes dans les logements tubulaires les une avec les autres dans la direction transversale par rapport aux axes des cigarettes.

6. Dispositif suivant l'une ou plusieurs des revendications précédentes, caractérisé en ce que les logements (4) tubulaires sont ouverts aux deux extrémités et il est prévu un guide (8) pouvant être déplacé et coopérant également avec les extrémités des cigarettes faisant saillie des autres extrémités du logement (4) tubulaire, le guide (8) de maintien déplaçable sur les extrémités des loge-

ments (4) tubulaires faisant face aux postes de transfert étant muni d'ouverture (308) à proximité des postes pour le passage des rangées de cigarettes.

7. Dispositif suivant l'une ou plusieurs des revendications précédentes, caractérisé en ce que la disposition en quinconce axiale des rangées superposées de cigarettes est réalisée de telle manière que les extrémités de cigarettes dans les rangées sous-jacentes font saillie au-delà de celles des rangées supérieures, aux extrémités des logements (4) tubulaires plus éloignés des postes (S1, S1', S1'') de transfert, tandis qu'aux extrémités faisant face aux postes on trouve la disposition opposée, les extrémités de cigarettes dans les rangées supérieures faisant saillie au-delà des extrémités de celles des rangées sous-jacentes, le guide (7) de maintien déplaçable aux extrémités des logements (4) tubulaires plus éloigné des postes (S1, S1', S1'') de transfert étant réalisé par des gradins continus en fonction de la disposition en quinconce axiale et du nombre précis de rangées dans les logements (4) tubulaires, tandis que le guide 8 de maintien déplaçable aux extrémités faisant face aux postes (S1, S1', S1'') de transfert est muni d'une surface (208, 208', 208'', 208''') de superposition qui coopère, en succession conformément à l'avance des logements (4) tubulaires à partir d'un poste (S1, S1') en amont jusqu'à celui (S1', S1'') immédiatement après lui, seule la rangée de cigarettes insérée au poste de transfert en amont se terminant à l'extrémité en amont du poste (S1', S1'') de transfert suivant, la surface (208, 208' 208'', 208''') de superposition étant disposée en quinconce d'un échelon correspondant à la rangée des cigarettes insérée, dans le logement (4) tubulaire, dans la direction d'avance des logements, tandis que les rangées inférieures de cigarettes sont maintenues uniquement par les rangées superposées sur elles.

8. Dispositif suivant l'une ou plusieurs des revendications précédentes, caractérisé en ce que les guides (7, 8) pouvant être déplacés et opposés ont également des surfaces (107, 108, 108') qui sont transversales par rapport aux axes des cigarettes, le long desquelles les extrémités des cigarettes coulisent, et qui sont à distance les unes des autres suivant la direction axiale par rapport aux cigarettes d'une quantité sensiblement égale ou légèrement supérieure à la longueur des cigarettes, les surfaces correspondant aux élévations des échelons du guide (7) de maintien déplaçable aux extrémités des logements tubulaires éloignés des postes de transfert, tandis que le guide (8) de maintien déplaçable aux extrémités du logement (4) tubulaire faisant face aux postes (S1, S1', S1'') de transfert ont des segments de surface (108, 108') transversale,

chacun situé entre un poste (S1, S1') de transfert et le suivant (S1', S1'') et disposé en quinconce axialement d'un échelon par rapport aux segments amont et d'une quantité correspondant à la disposition en quinconce axiale des rangées de cigarettes, tandis que les rangées sous-jacentes restantes de cigarette insérées dans les postes (S1, S1') de transfert précédents, sont axialement libres.

9. Dispositif suivant l'une ou plusieurs des revendications précédentes, caractérisé en ce que les guides (7, 8) opposés ont des parties terminales s'étendant au-delà du poste de transfert final pour la rangée finale des cigarettes à insérer dans les logements (4) tubulaires, le guide (7) aux extrémités éloignées du poste (S1, S1', S1'') de transfert étant muni d'une surface (107'') transversale qui est alignée avec la surface (107) transversale du gradin associé aux rangées de cigarettes faisant saillie les plus loin des extrémités associées des logements (4) tubulaires, tandis que le guide (8) opposé est muni d'une paroi (108'') transversale qui est inclinée vers le guide (7) opposé d'une manière correspondant aux dispositions en quinconce des rangées finales de cigarettes insérées dans les logements (4) tubulaires au poste (S1'') de transfert final, les deux parois transversales s'étendant sur toute la section des logements (4) tubulaires.

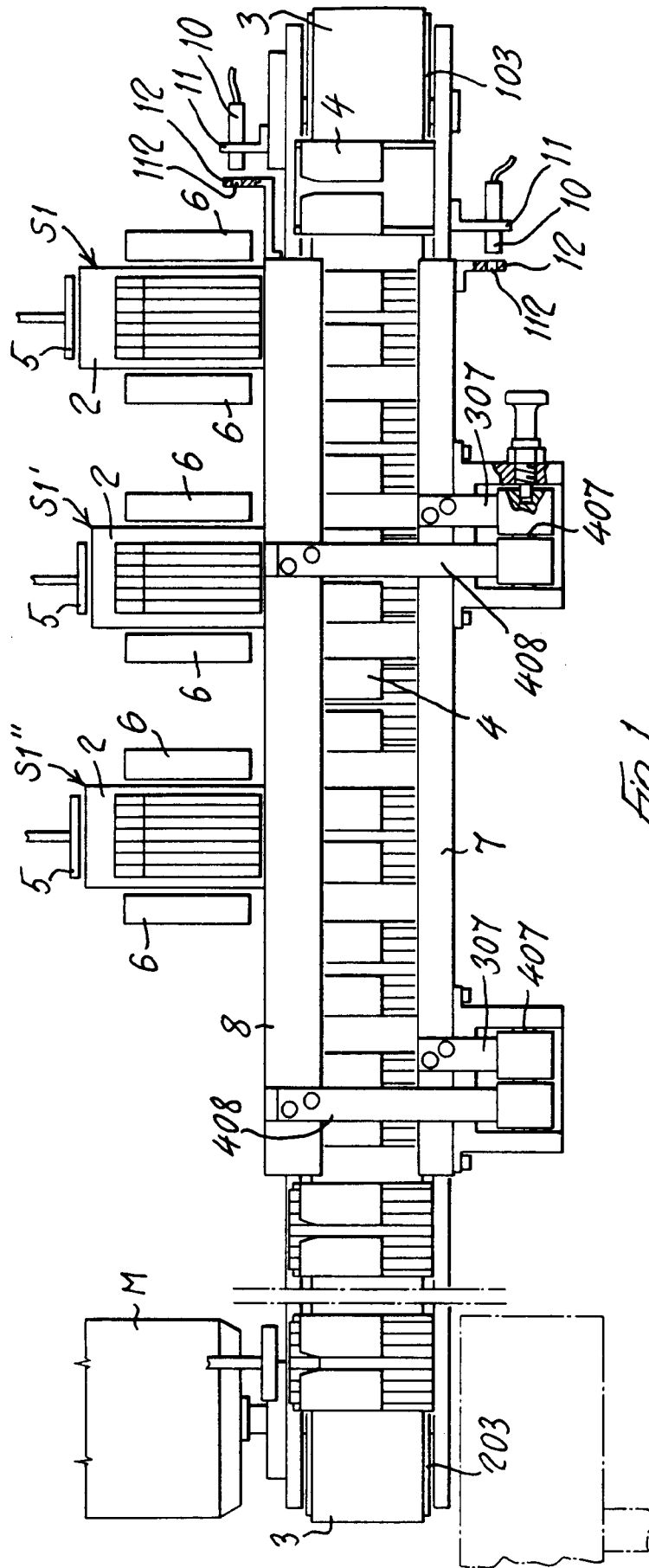
10. Dispositif suivant la revendication 9, caractérisé en ce que les parties terminales des guides (7, 8) au-delà du poste (S1'') de transfert final et une ligne de surface (207'', 208'') de superposition uniquement aux extrémités correspondantes des cigarettes de la rangée finale insérées dans le poste (S1'') de transfert final.

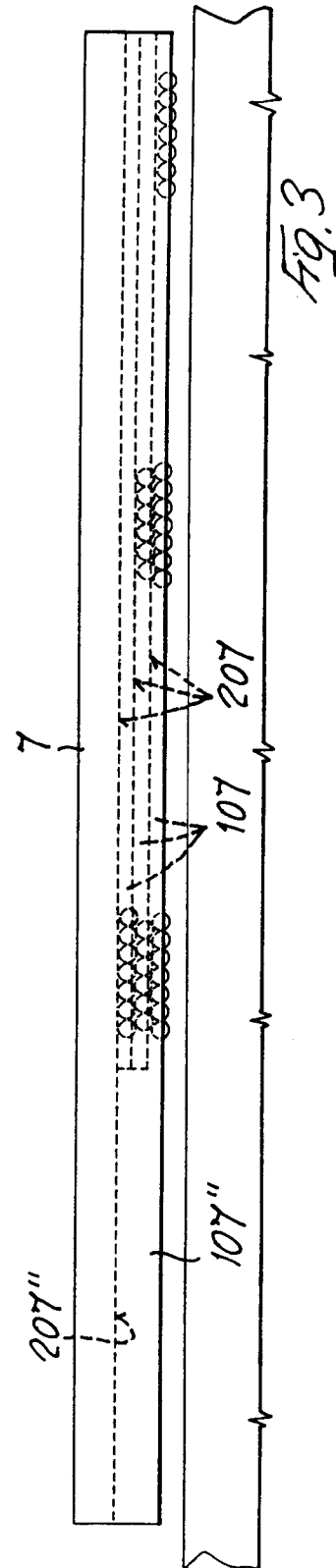
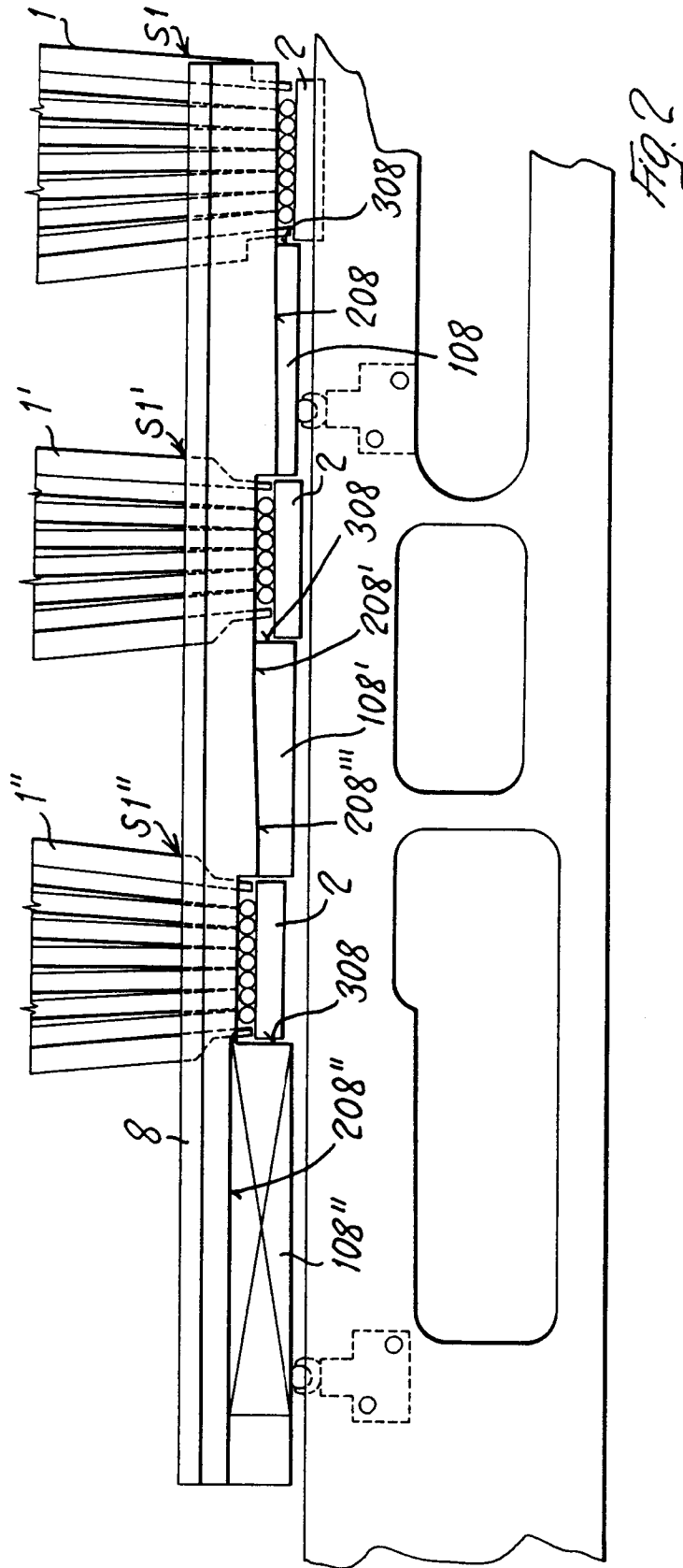
11. Dispositif suivant l'une ou plusieurs des revendications précédentes, caractérisé en ce qu'aux ouvertures (308) pour le passage des rangées de cigarettes dans le guide (8) sur le côté des postes (S1', S1'') de transfert notamment après le premier poste (S1) de transfert, il est prévu une lame (9) de superposition aux extrémités des cigarettes faisant face aux postes (S1', S1'') de transfert de la rangée de cigarettes insérée au poste de transfert précédent, cette lame (9) de superposition étant montée de sorte qu'elle fait saillie vers le logement (4) tubulaire à partir d'un élément (2) de support, en d'autres termes une surface de transfert prévue au poste, et s'étend en affleurant avec la surface (2) de transfert, et sensiblement en affleurant avec la surface (208, 208') de superposition verticale de la partie du guide (8) entre le poste (S1'', S1') de transfert et le poste (S1', S1) de transfert précédent qui est interrompu par l'ouverture (308).

12. Dispositif suivant la revendication 11, caractérisé

en ce que sont insérées dans le logement (4) tubulaire au moins deux et de préférence trois rangées de cigarettes, les unes superposées aux autres, une rangée, de préférence l'intermédiaire, étant disposée dans un agencement en quinconce avec la rangée immédiatement sous-jacente, et une lame (9) de superposition étant prévue et étant interposée entre les extrémités de la rangée sous-jacente des cigarettes et les extrémités de la rangée supérieure des cigarettes, tandis que la surface de superposition du guide (8) pour la rangée en quinconce est munie d'une partie initiale au poste (S1', S1'') de transfert qui est superposée sur la rangée des cigarettes qui n'est pas dans la position de quinconce, et ayant une partie (208''') terminale suivante inclinée progressivement vers la rangée des cigarettes coopérant avec elle, d'une quantité correspondant à la différence entre la disposition en quinconce et la disposition qui n'est pas en quinconce.

13. Dispositif suivant une ou plusieurs des revendications précédentes, caractérisé en ce que les surfaces (2) de transfert des rangées de cigarettes sont disposées horizontalement et sont décalées d'une hauteur correspondant à la différence de sensiblement un diamètre d'une cigarette entre un poste (S1, S1') de transfert et le suivant (S1', S1''), tandis que les logements (4) tubulaires sont portés par une courroie (3) de convoyage continue, dont la section horizontale supérieure est placée à un niveau tel que chaque rangée de cigarettes sur la surface (2) de transfert correspondante est automatiquement placée à la hauteur de la position qui est prise dans le logement tubulaire au moment de l'insertion, les surfaces (207, 207') de superposition et (208, 208', 208'') des guides (7, 8) étant horizontales et les surfaces (107, 107', 108, 108', 108'') étant verticales.





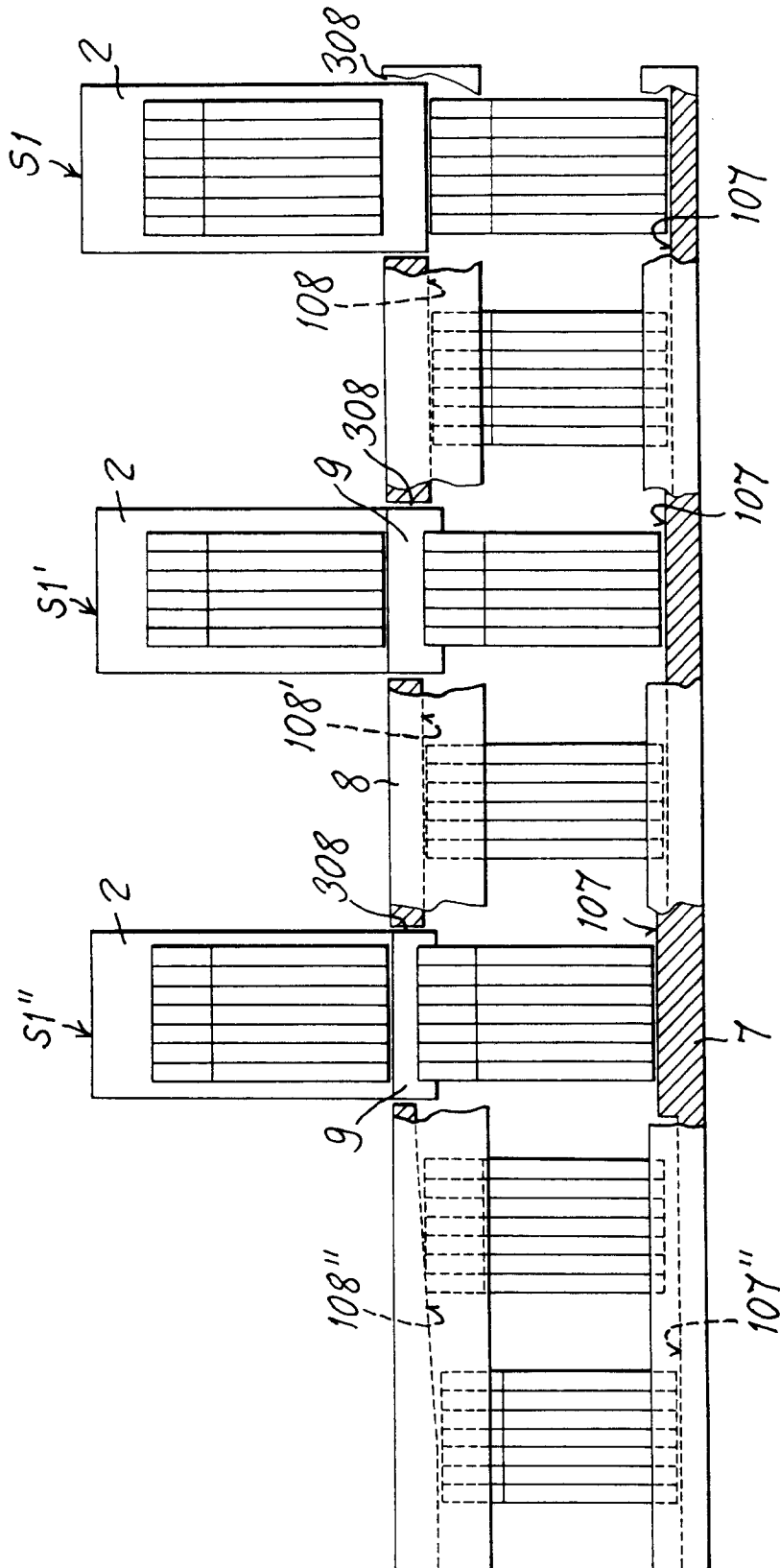


Fig. 4

