

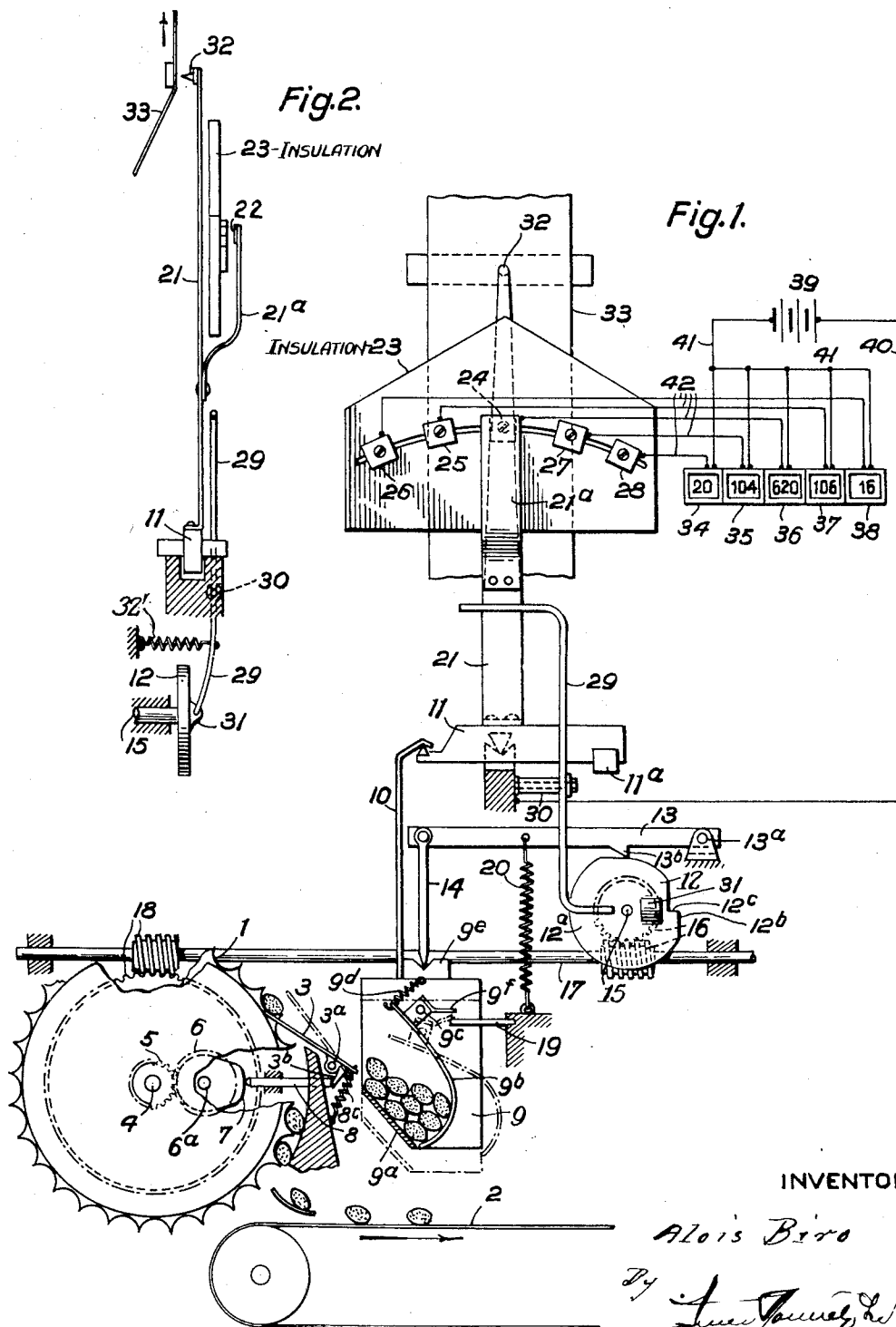
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WEIGHING SCALE FOR CIGARETTES

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WEIGHING SCALE FOR CIGARETTES

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The present invention relates to a process for the automatic determination of the weight of the cigarettes leaving the cigarette machine. This determination may be used for statistical purposes, but it is mainly intended for regulating, with the aid of its results, the supply of tobacco to the machine as well as the state of the machine and of the tobacco in other respects, this regulation being effected either by hand or by means of regulating or controlling devices actuated automatically by the apparatus.

It is already known to weigh in groups the cigarettes coming from a rod cigarette machine, the supply of the cigarettes being effected in the known devices either continuously, that is to say, the cigarettes travel, as they come from the cigarette machine, continuously over a balance, or the cigarettes are supplied to the balance at irregular intervals, that is to say, samples are taken by hand each time from the finished cigarettes and are placed on the balance pan. It has not been possible for the first-mentioned process to become established in practice, because such a balance works too slowly, while the last-mentioned process does not provide sufficiently exact information.

In the process according to the invention, the cigarettes to be weighed are taken automatically and periodically from the delivery member, which delivers the cigarettes from the cigarette machine, and are supplied to a balance. By suitable means, the throw of the said balance actuates counters, if desired also a recording mechanism, the different counters corresponding to throws of different amplitude such that one counter indicates the cigarettes of correct weight, while the other counters indicate the cigarettes with overweights or underweights of different magnitudes.

From the distribution of the weighings among the individual counters, and from the relationship between the different numbers, it is possible to see at once how the cigarette machine is working, in order to effect the appropriate regulation by hand, although it is also possible to effect an automatic control of the supply of tobacco by means of the devices controlling the counters.

A constructional example of the invention is shown in the accompanying drawing, wherein:

Figure 1 is a diagrammatic illustration of a device according to the invention in front view, and

Figure 2 is a side view of the same in part section.

The cigarettes leaving the cigarette machine

are fed in the usual manner upon a drum 1 provided with grooves in its periphery. The drum revolves continuously, and feeds the cigarettes on to a conveyor band 2, which takes them to the delivery place or the packing machine. A certain number of successively manufactured cigarettes have now to be weighed periodically. For this purpose there is provided a counting member 3 which is pivotally mounted on a pivot 3a in the machine frame. The said counting member comprises a fork, the prongs of which are inserted in the grooves which run peripherally round the drum, so that the said prongs engage below the cigarettes lying in the grooves 1 of the drum, lift the said cigarettes out of the drum and allow them to slide over the counting member. The counting member 3 is set periodically from the drive of the machine, a gear 5, meshing with a gear 6, being provided on the shaft 4, which is set continuously in rotation by the main drive of the machine and carries the grooved drum 1. On the spindle 6a of the said gear 6 is mounted a cam 7, which acts against a rod 8 slidable in its axial direction in the machine frame. The other end of the said rod 8 bears against a lug 3b on the counting member 3, the rod 8 being maintained permanently in contact with the cam and the counting member by means of a spring 8c. Consequently, the counting member will be pushed periodically by the cam 7 either into the position shown in full lines, in which position it lifts the cigarettes out of the drum and allows them to slide into a balance pan 9, or into the position shown in dotted lines, in which the cigarettes remain in the grooves and fall upon the conveyor band 2. The balance pan 9 has a fixed bottom 9a and a movable bottom 9b, the latter being pivoted to the balance pan 9, about a pin 9c and being held by a spring 9d in the position shown in full lines in the drawing. The balance pan is secured by means of a suspension rod 10 to balance beam 11, which is so tared by the weight 11a that the balance does not turn when the counted number of cigarettes falling into the balance pan has the correct weight. The weight 11a may be made adjustable in order to adapt the apparatus to any particular weight of the cigarettes which are to be weighed. The balance pan is held against an upward movement in the inoperative position by a plunger 14 which is vertically guided in the machine frame and bears with its lower pointed end in a guide 9e on the balance pan. The other end of the plunger 14 is pivoted to a lever 13 which is pivotally

mounted in the machine frame on a pivot 13a. The lever has a nose 13b, which runs on the periphery of a cam 12. The cam is so constructed that, after completion of the weighing operation, it periodically lowers the balance pan, thereby opening the balance pan. For this purpose the movable bottom 9b is provided with a nose 9f lying above an abutment 19 which is fast in the machine frame. During the weighing operation, the plunger 14 is held by the nose 13b of the lever 13 lying on the cam part 12a of the cam 12, which rotates at a uniform speed. At the end of the weighing operation, the nose 13b of the lever 13 lies on the cam part 12b. Since the curve of the cam drops at this place, the plunger 14 sinks, thereby taking the balance pan down with it. When now the balance pan is near the abutment 19, the sharp drop 12c of the cam 12 causes a further sudden sinking of the plunger, so that the nose 9f strikes against the abutment 19 and the balance pan is quickly opened, the movable part being moved into the position shown in dotted lines. The cigarettes then fall out upon the conveyor band 2. Due to the lowering of the balance pan, the latter is very close to the conveyor band during the release of the cigarettes, thereby obviating damage to the cigarettes. The lever 13 is held in engagement with the cam 12 by a spring 20.

In order that the apparatus taking the cigarettes from the drum and the weighing device shall work properly in unison, the actuating movement of the weighing device and the actuating movement of the counting apparatus are worked off the same drive. The drive is taken from a shaft 17 of the cigarette machine, which shaft by means of gearing, for example a helical gear or worm gear 18 sets in rotation the shaft 4 driving the grooved drum 1 and the counting apparatus 3, and by means of gearing, i. e. a helical gear or a worm gear 16 also drives the shaft 15 carrying the cam 12.

The throw of the balance beam 11, the coming to rest of which may be accelerated by a damping device, not shown, is transferred to a pointer or lever 21. The lever 21 carries a contact plate 22 at its upper end. A fixed plate 23 of electrically insulating material is also secured to the machine frame, the said plate carrying a number of contact studs, in the constructional example shown, five such contact studs, 24 to 28. As shown in Figure 2, the lever arm 21 with the contact plate 22 moves at a certain distance from the plate 23 so that the contacts do not touch and the balance is free to come to rest. In order to press the preferably springy lever 21 against the contacts after the balance has come to rest, a double lever 29 is provided which is pivoted on a spindle 30 on the machine frame and is moved by a boss 31 on the cam 12. A spring 32' holds the arm 29 in engagement with the cam 12 and re-opens the contact. The contact plate 22 is fast on an extension 21a riveted to the lever 21, while the lever 21 itself, which lies behind the plate 23, may be extended upwardly and may carry a stylus or perforating pin 32. By means of the said stylus or pin, it can inscribe or perforate a strip 33 moved step by step behind it. The contacts serve to close electrical circuits for actuating a corresponding number of counters, provided in the drawing with the reference numerals 34 to 38. Since the counters may be of known construction, the drawing only shows the front dial indicating the number counted. The connections are such that one pole

of a battery 39 is connected by a lead 40 to the frame of the machine. The second pole of the battery is connected by leads 41 with one terminal respectively of each of the counters, while the second terminals of each of the counters are connected by leads 42 to one of the contact studs 24 to 28, respectively. Therefore, when the contact plate 22 is pressed against one of the contacts 24 to 28, a circuit is closed which causes a further actuation of the counter in question. The balance is so tared that the lever 21 retains approximately its central position in the case of the normal weight, when the contact 24 is closed and the counter 36 is actuated. If the cigarettes have overweight, the lever 21 makes a movement to the left and, on being pressed, comes into contact with one of the contacts 25 or 26, according to the magnitude of the overweight thereby actuating the counter 37 or 38. In the presence of an underweight, the contact 27 or 28 will be closed correspondingly and one of the counters 34 or 35 will be actuated, since the counter 36 gives the weighings with correct weight, the counters 35 and 37 the weighings with slight underweight or overweight, respectively, and the counters 34 and 38 the weighings of large underweight or overweight, respectively.

Of course, the number of counters and contacts provided may be as large as desired, the stages of the underweights and overweights to be registered being regulated accordingly. According to the result of these countings, the supply of tobacco may be adjusted by hand, or a control device for regulating the tobacco supply may be actuated by means of the perforated strip 33, which will contain perforations at different places depending upon the throw of the pointer.

If it is desired to alter the amount of the overweight or underweight which is to be indicated, the counterpoise 11a may be adjusted, as mentioned in the foregoing, although the contacts 25 to 28 may also be made adjustable on the plate 23, as is indicated in the drawing by their being fixed in slots.

I claim:—

1. A device for the automatic control of the weight of the cigarettes leaving a cigarette machine comprising a balance, a mechanism adapted to periodically take a group of cigarettes from a delivery member of the cigarette machine and supply it to said balance, a pan on said balance which is adapted to move slowly against a conveyor band of the cigarette machine, a movable bottom on said pan, balance actuating means adapted to lower said pan after each weighing first slowly and then suddenly, and an abutment which is engaged by the pan during its sudden movement thereby opening the pan and discharging it.

2. A device for the automatic control of the weight of the cigarettes leaving a cigarette machine comprising a balance, a mechanism adapted to periodically take a group of cigarettes from a delivery member of the cigarette machine and supply it to said balance, a pan on said balance, a movable bottom on said pan, balance actuating means comprising a plunger adapted to engage said pan for locking it against upward movement or to lower it for the purpose of opening it, respectively, and a cam adapted to be driven with uniform speed by the cigarette machine and operating said plunger as well for the locking movement as for the lowering movement.

3. A device for the automatic control of the

weight of the cigarettes leaving a cigarette machine comprising a balance, a mechanism adapted to periodically take a group of cigarettes from a delivery member of the cigarette machine and supply it to said balance, a pan on said balance which is adapted to move slowly against a conveyor band of the cigarette machine, a movable bottom on said pan, a nose on said pan balance, actuating means adapted to lower said pan after each weighing and an abutment which is engaged by the said nose of the pan during its sudden movement thereby opening the pan and discharging it.

4. A device for the automatic control of the weight of the cigarettes leaving a cigarette machine comprising a balance, a mechanism adapted to periodically take a group of cigarettes from a delivery member of the cigarette machine and supply it to said balance, a pan on said balance, a movable bottom on said pan, a guide on the balance, and balance actuating means comprising a plunger adapted to engage said guide thereby locking it against swinging in its inoperative position.

5. A device for the automatic control of the weight of the cigarettes leaving a cigarette machine comprising a balance, a mechanism adapted to periodically take a group of cigarettes from a delivery member of the cigarette machine and supply it to said balance actuating means, counters, of which one counts the weighings with correct weight while the others count the weighing

having an incorrect weight, a tongue connected to the balance, a contact carried by said tongue, a number of other contacts electrically connected with said counters and being opposite to said first mentioned contact and means controlled by said balance actuating means adapted to press said first mentioned contact after each weighing against one of the other contacts being at that time opposite thereby closing a circuit actuating the corresponding counter.

6. A device for the automatic control of the weight of the cigarettes leaving a cigarette machine comprising a balance, a mechanism adapted to periodically take a group of cigarettes from a delivery member of the cigarette machine and supply it to the said balance, a pan on said balance, a movable bottom on said pan, balance actuating means adapted to lower said pan after each weighing comprising a cam driven with uniform speed off the cigarette machine, counters, of which one counts the weighings with correct weight while the others count the weighing having an incorrect weight, a tongue connected to the balance, a contact carried by said tongue, a number of other contacts electrically connected with said counters and being opposite to said first mentioned contact and a lever moved by said cam and adapted to press said first mentioned contact after each weighing against one of the other contacts thereby closing a circuit actuating the corresponding counter.

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