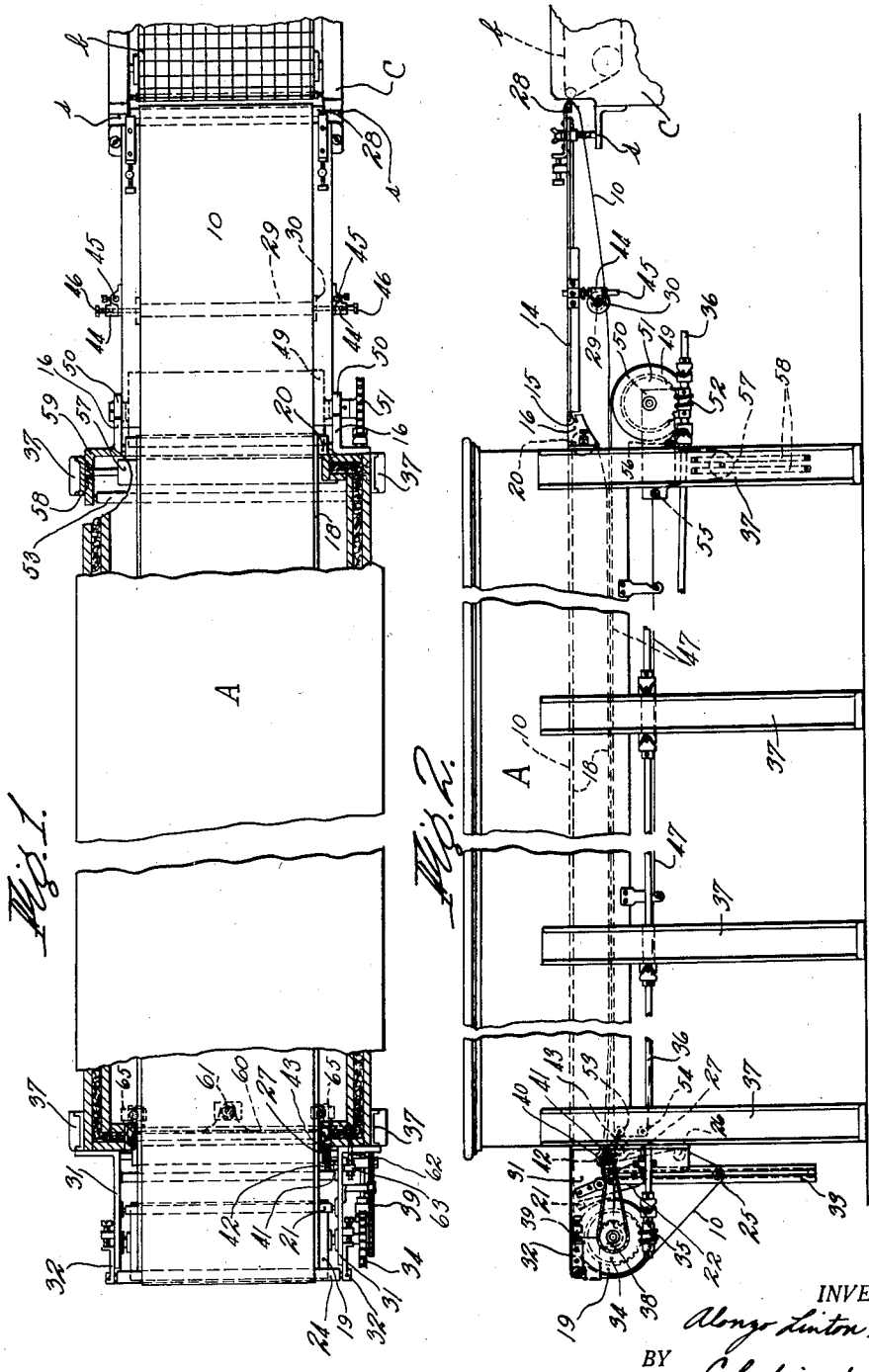
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A. L. BAUSMAN

DELIVERY APPARATUS FOR CONFECTIONERY MACHINES

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INVENTOR.
Alonzo Linton Bausman
BY Chapin & Neal
ATTORNEYS.

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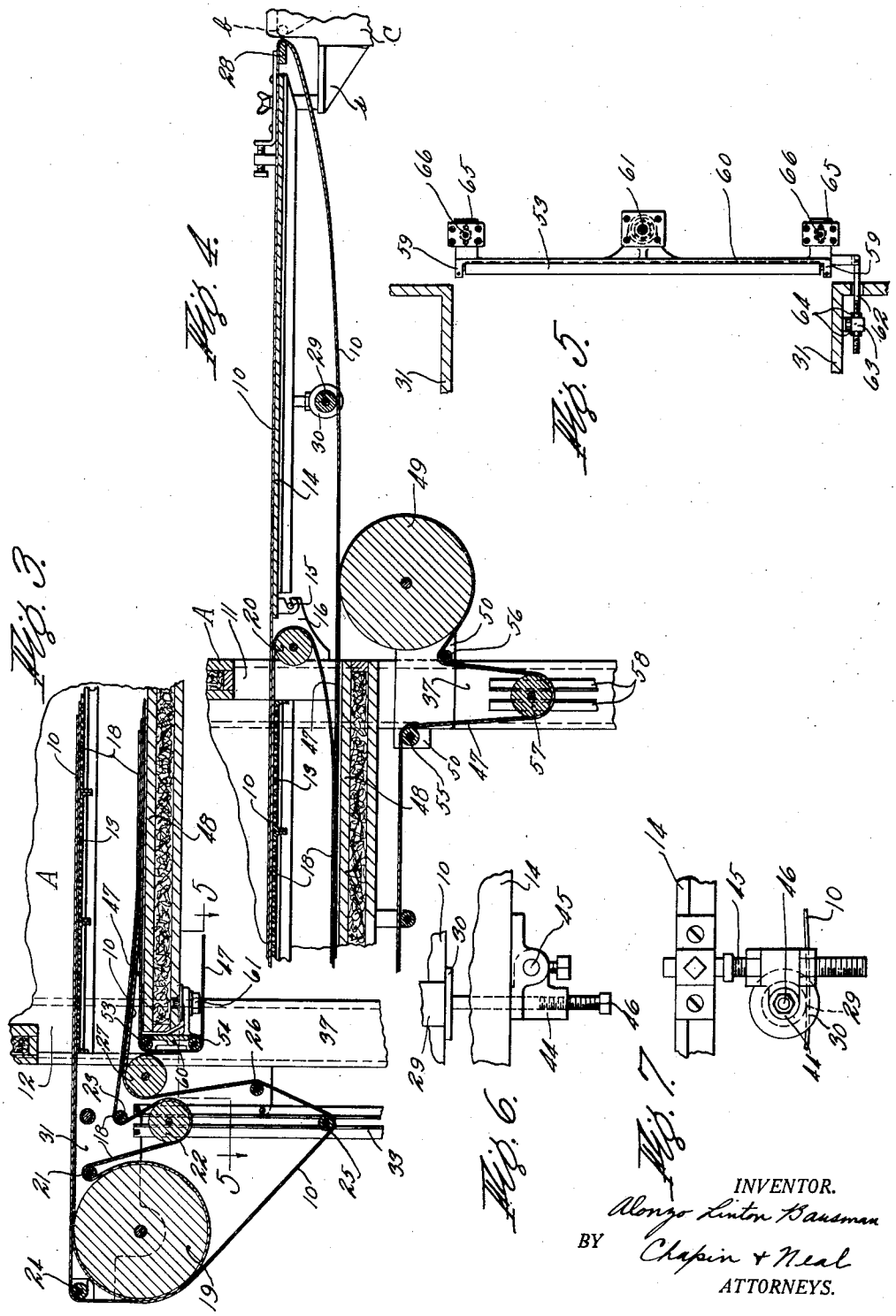


Fig. 4.

Fig. 5.

Fig. 3.

Fig. 6.

Fig. 7.

INVENTOR.
Alonzo Linton Bausman
BY Chapin & Neal
ATTORNEYS.

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UNITED STATES PATENT OFFICE.

ALONZO LINTON BAUSMAN, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO NATIONAL EQUIPMENT COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

DELIVERY APPARATUS FOR CONFECTIONERY MACHINES.

Application filed May 17, 1926. Serial No. 109,579.

This invention relates to delivery apparatus for confectionery machines.

Such apparatus includes a conveyer on the upper stretch of which confections are deposited and carried until they have hardened. In some cases, the conveyer is arranged to travel through a cooling box to accelerate the hardening of the confections while, in other cases, the box is omitted and the cooling is effected by other means. Usually, the conveyer receives freshly coated confections directly from the discharge end of a chocolate coating machine although it is equally well adapted to have confections, such as chocolate buds or the like, dropped directly thereupon from a so-called depositor.

A conveyer for the particular purpose just described must have a smooth polished surface which is impervious to chocolate. It is usual to use an endless belt of waxed paper for this purpose and to support the upper stretch of this paper belt by an underlying driving belt of a material having the requisite amount of tensile strength, such as canvas, for example. The paper belt, in its upper stretch of travel is pressed against the canvas belt by the weight of the confections carried thereby and the canvas belt, which is suitably driven, drives the paper belt by frictional contact therewith. The paper belt, in its return stretch of travel, has not been effectively supported, or driven, according to prior practice.

Common waxed paper belts cannot be successfully used in an apparatus constructed in accordance with the prior practice just described. That is, if they are used, they will last only a short time because of their low tensile strength and the ease with which they become torn. Such belts will seldom last over a day in service. Consequently, special belts have been constructed for this purpose, which comprise waxed paper with a cloth backing. These are expensive but have much longer life.

One of the objects of this invention is to provide means, in an apparatus of the general character described, whereby the use of such special and expensive belts will not be necessary and ordinary waxed paper belts may be successfully used over long periods of useful service. In carrying out this object, a second belt, which may be of canvas, is mounted so that its upper stretch travels in the same direction as the lower stretch of the paper belt and in underlying and contiguous relation with a substantial portion thereof, whereby the paper belt is supported and relieved from the strain of its own weight. Also the return stretch of the upper canvas belt is made to press the paper belt against the underlying canvas belt, so that the paper belt is frictionally engaged between two canvas belts moving in the same direction at the same surface speed, whereby a driving effort is imparted to the lower stretch as well as to the upper stretch of the paper belt to relieve it of the major portion of the tensile strain to which it would be subjected if driven in the ordinary manner.

The arrangement described, when used in connection with a cooling box, has other important advantages. For instance, should the paper belt break, as may occasionally happen, one end of it can be threaded through the lower part of the cooling box by placing it between the contiguous portions of the two canvas belts. In this way one end of the belt may easily and quickly be carried through the cooling box so that it can be spliced to the other end of the belt. Moreover, the lower belt, used to support the paper belt in its return stretch of travel, forms a moving floor for the bottom of the cooling box and keeps the same clean. Particularly, it prevents the accumulation in the bottom of said box of the many small fragments and broken bits of chocolate which fall from the paper belt during its return stretch of travel. Such fragments, if not carried out of the box in this manner, soon accumulate to such an extent as to cause difficulties.

Other objects and advantages will appear in the following description and will be pointed out in the appended claims.

The invention will be disclosed for illustrative purposes in connection with the accompanying drawings, in which:—

Fig. 1 is a small scale plan view, partly in section, showing the invention as used in connection with a cooling box;

Fig. 2 is a side elevational view thereof;

Figs. 3 and 4 are fragmentary sectional elevational views showing the delivery and receiving ends, respectively, of the apparatus;

Fig. 5 is a sectional plan view taken on the line 5—5 of Fig. 3; and

Figs. 6 and 7 are top plan and elevational views, respectively, of the supporting means for the paper belt straightening roll.

Referring to these drawings; the invention has been shown as embodied in a confection cooling apparatus of the general type disclosed in my prior U. S. Letters Patent No. 1,567,633, dated December 29, 1925. Such apparatus includes a long box-like casing A in which cold air is circulated, as disclosed in said patent, for the purpose of cooling the confections, such for example as the coatings of confections which have been freshly coated with chocolate. These confections are carried longitudinally through casing A by, and on the upper stretch of travel of, an endless belt 10, which may be of any suitable material having a smooth, glossy surface impervious to chocolate. It may, according to this invention, be ordinary heavy waxed paper. The confections from a chocolate coating machine, a small fragment of which is shown at C, are delivered by the coating machine belt *b*, onto the endless paper belt 10, carried through an opening 11 in one end of casing A into and through the latter, emerging through an opening 12 in the opposite end of casing A. The cooled confections pass off belt 10 at the delivery end of its upper stretch of travel onto any suitable receiving device.

Within the casing A, and mounted and constructed as shown in said patent, is a table 13 of thin, and preferably foraminous, sheet metal which table extends from end to end of casing A and serves to support the paper belt for the major portion of its upper stretch of travel. A table 14, pivoted at 15 to brackets 16 secured to one end of casing A, spans the space between such end and the coating machine belt *b* and serves as an extension of table 13 to support the belt 10 in another substantial portion of its upper stretch of travel. Table 14 may be supported as indicated, from a shelf *s* of coating machine A or in any other suitable way.

The belt 10 is driven, in its upper stretch of travel, by frictional contact with an underlying belt 18, which may be and usually is of canvas. Belt 18 is trained around two end rolls 19 and 20, the former being a driving roll and the latter an idler roll. Roll 20 is rotatably mounted in the brackets 16, above described, wherefore belt 18 does not travel over the table 14 but merely over the entire length of table 13. The weight of the confections on belt 10 presses the latter against belt 18 and creates sufficient frictional engagement between the two for the driving function.

The belt 18 has a large arc of contact with the driving pulley 19 by reason of the particular location shown of an idler roll 21, over which the belt travels in leaving the driving roll. From roll 21 belt 19 passes downwardly and around a roll 22, which is bodily movable in a vertical path and by its weight serves to tension belt 18. From roll 22, belt 18 passes upwardly and over a small idler roll 23 from which it passes through the casing A to the idler end roll 20.

The belt 10 does not follow the path of belt 18 around roll 19 but extends horizontally beyond the same to a small roll 24. From the latter, belt 10 passes vertically downwardly until it touches belt 18. It then follows the belt for a very small arc of its travel after which it passes downwardly and in under a tension roll 25. Roll 25 is bodily movable in a vertical path and by its weight serves to tension belt 10. The weight of roll 25, however, is much less than that of tension roll 22 and is not heavy enough to create an undue tensile stress in belt 10. From roll 25, the belt 10 passes upwardly; engaging a small idler roll 26 and continuing upwardly to a roll 27 from which it passes through the casing A back to the remote end of table 14. Belt 10 passes around the rounded edge of a thin plate 28 mounted on that end of table 14 adjacent the coating machine. The belt 10, in its return travel, is engaged by a roll 29 having end flanges 30, which roll is used to straighten the belt when necessary and adjust its path of travel.

The rolls 19, 21, 23 and 27 are rotatably supported near their ends in, and extend between, two spaced parallel frames 31 which are secured to the delivery end of casing A. Roll 24 is rotatably supported at its ends in brackets 32, which are adjustably secured, as indicated, one to each frame 31. The tension rolls 22 and 25 have their ends received between pairs of spaced, parallel, angle-iron guides 33 which are secured one pair to each frame 31 and extend vertically downwardly therefrom.

The roll 19 carries at one end a worm gear 34 which is driven by a worm 35 fixed to a shaft 36. The latter is supported at intervals in bearings fixed to certain of the supporting legs 37 for casing A and extends back to the coating machine C, from which it is driven in any suitable way. Adjacent worm gear 34, and fixed to roll 19, is a sprocket 38 which drives by a chain 39 a sprocket 40 rotatably mounted on a shaft 41 fixed to one of the frames 31. Fixed to sprocket 40 is a gear 42 which drives a gear 43 fixed to roll 27, above described.

The paper belt straightening roll 29 is supported at its ends in bearings 44 which are vertically adjustable, as indicated, on vertical rods 45, secured to and depending from table 14, one near each side thereof.

Screws 46, threaded into bearings 44 in alignment with the ends of the roll 29, permit the latter to be adjusted axially back and forth, whereby to adjust the lateral position of the end flanges 30 which guide belt 10. Also, the bearings can be adjusted independently of each other to lie at different vertical positions and effect a tilting of the roll 29, which is frequently useful to cause the paper belt 10 to run smoothly and flatly on the table 14.

With the apparatus above described, I provide an additional belt 47 which may be, and usually is, of canvas, and I mount this belt so that in its upper stretch it passes through the casing A moving in the same direction as that in which the belts 10 and 18 move in their lower stretches of travel. Belt 47, in its upper stretch of travel moves between the belts 10 and 18 and the floor 48 of casing A. It also moves in such a path that the return stretches of belts 10 and 18, which naturally sag, will be supported thereby. The belt 47 carries the weight of belt 10 and the latter is pressed against belt 47 by the weight of belt 18, whereby the belt 10 is frictionally held between the belts 18 and 47 and thereby driven therewith.

The belt 47 is driven by a roll 49 which is rotatably supported at its ends in and extends between a pair of laterally spaced frames 50 secured one to each of a pair of legs 37 at one end of casing A and below the latter. Roll 49 carries a worm gear 51 which is driven by a worm 52 fixed on shaft 36, above described. The roll 49, in conjunction with a roll 53, defines the ends of the upper stretch of travel of belt 47. From roll 53 belt 47 extends downwardly to a roll 54 located vertically therebelow and then passes horizontally and below casing A back to a small idler roll 55. The latter is mounted in frames 50, as is a similar idler roll 56. The belt 47 passes over roll 55 and then down to and around a tension roll 57 from which it passes up to and over roll 56, returning from the latter to driving roll 49. The tension roll 57 is mounted for vertical movement,—its ends being received between pairs of laterally spaced, vertically disposed angle irons 58, which are secured to the inner faces of the pair of legs 37 to which frames 51 are secured.

The rolls 53 and 54 are mounted one above the other in a pair of laterally spaced upstanding arms 59. The latter are integral parts of a cross bar 60 which is pivoted at 61 to the bottom wall of casing A near the delivery end thereof. Fixed at one end to one end of bar 60 is a horizontal rod 62, which at its other end is screw threaded and passes loosely through a hole in a bracket 63, fixed to frame 31. Rod 62 may be held to its bracket 63 in various positions of longitudinal adjustment by a pair of nuts 64. Thus, the cross bar 60 and the rolls carried thereby may be adjusted to straighten the belt 47, whenever necessary. Near each end of cross bar 60 are slotted lugs 65 which may be clamped to the bottom of casing A by bolts 66, whereby the cross bar may be held in the various positions of adjustment to which it may be moved.

It is to be noted that the confection-carrying belt 10 is not only driven in its upper stretch of travel but it is also driven in its lower stretch of travel. The belt 10 in its lower stretch of travel is frictionally held between the belts 18 and 47, by means of which arrangement the belt 10 is relieved of most of the tensile stress to which it would be subjected if driven in the same manner as an ordinary belt. Particularly, belt 10 in its lower stretch is pushed toward the rounded plate 28 while in its upper stretch it is pulled away from this plate. By pushing the belt 10 toward this plate in its lower stretch of travel, the turning of the sharp corner is facilitated and the belt relieved from the very considerable strain formerly imposed on it at this location. In fact, the belt 10 is driven by frictional contact over by far the greater portion of its area and in a manner such as to relieve it from the tensile strains to which it would be otherwise subjected. Also the belt is supported, wherever feasible, and in the greater portion of its travel is relieved from the stress of its own weight.

Furthermore, the arrangement permits of easy and rapid installation of a new belt because one end thereof can be inserted in the bight between the belts 18 and 47 and thus be "threaded", or carried through the lower part of the casing A to be spliced to the other end of the belt. The casing A, as shown in said patent, can be opened at the top so that there is no difficulty in laying in the upper course of belt 10. However, except for the arrangement just described, it would be difficult and inconvenient to pass the lower course of belt 10 through the cooling box.

Another feature, which is most important, is that the upper course of the belt 47 serves to keep the floor of the cooling box clean. When the cooled, chocolate-coated confections are stripped from belt 10 at the end of its upper course of travel there are frequently left adhering to the waxed paper belt small bits of chocolate, such as fins or fragments. These fragments gradually become loosened as the paper belt travels around the various rolls at the delivery end of the machine and many of them drop off from the belt during its lower course of travel through the cooling box and fall upon the floor thereof. In time, these particles accumulate to such an extent that they have to be removed which is usually a rather difficult and inconvenient opertion. With the

present scheme, the belt 47 forms a moving floor to protect the floor of the cooling box from the accumulation of the bits of chocolate which are conveyed by belt 47 out of the box and prevented from accumulating therein.

By the use of the belt 47, one is enabled to use a belt 10 of ordinary heavy waxed paper and the expense of specially constructed cloth backed belts is saved. This follows, because belt 10 is supported wherever possible and is frictionally driven over the larger part of its area. It is relieved of most of the tensile stress to which it has heretofore been subjected and therefore does not have to have much tensile strength.

This last named feature of the invention is of course, independent of whether or not a cooling box is employed. The other advantages enumerated are realized only when the cooling box is used but they are, notwithstanding, independent of any particular form of cooling box.

The invention has been disclosed herein, in an embodiment at present preferred, for illustrative purposes but the scope of the invention is defined by the appended claims rather than by the foregoing description.

What I claim is:

1. In a delivery apparatus for confectionery machines, an endless belt adapted in its upper stretch of travel to carry confections, an endless driving belt which in its upper stretch of travel underlies, frictionally engages and supports a substantial portion of the upper stretch of the confection carrying belt, and a second endless belt which in its upper stretch of travel moves in the same direction as the lower stretch of the driving belt and is adapted to underlie and support a substantial portion of the confection carrying belt in its lower stretch of travel, said driving belt in its lower stretch of travel and said second belt in its upper stretch of travel adapted to receive between them said confection carrying belt in its lower stretch of travel and to frictionally engage opposite faces thereof.

2. In a delivery apparatus for confectionery machines, an endless belt of relatively low tensile strength adapted in its upper stretch of travel to carry confections, an enless driving belt which in its upper stretch of travel underlies, frictionally engages and supports a substantial portion of the upper stretch of the confection carrying belt, and a second endless belt which in its upper stretch of travel moves in the same direction as the lower stretch of the driving belt and is adapted to underlie and support a substantial portion of the confection carrying belt in its lower stretch of travel, said driving belt in its lower stretch of travel and said second belt in its upper stretch of travel adapted to receive between them said confection carrying belt in its lower stretch of travel and to frictionally engage opposite faces thereof, and guiding devices to so direct the driving belt in its lower stretch of travel into engagement with said second belt in its upper stretch of travel that a convergent entrance is formed between them.

3. In delivery apparatus for confectionery machines, a box like casing, an endless belt mounted to travel through said casing from end to end thereof with its upper stretch moving in an approximately horizontal path to carry the confections, an endless driving belt which in its upper stretch of travel underlies, supports and frictionally engages a substantial portion of the upper stretch of the confection carrying belt, and a second endless belt which in its upper stretch of travel moves through said casing between the lower stretches of travel of the first named belts and the floor of said casing, said last named belt forming a moving floor for said casing to receive particles of the confections dropping from the first named belt and convey them out of said casing.

4. In delivery apparatus for confectionery machines, a box like casing, an endless belt mounted to travel through said casing from end to end thereof with its upper stretch moving in an approximately horizontal path to carry the confections, an endless driving belt which in its upper stretch of travel underlies, supports and frictionally engages a substantial portion of the upper stretch of the confection carrying belt, and a second endless belt which in its upper stretch of travel moves through said casing in the same direction as the lower stretch of the driving belt and is adapted to underlie and support a substantial portion of the confection carrying belt in its lower stretch of travel, said driving belt in its lower stretch of travel adapted to press the confection carrying belt in a substantial portion of its lower stretch of travel against the upper stretch of said second belt.

In testimony whereof I have affixed my signature.

ALONZO LINTON BAUSMAN.