

Feb. 11, 1969

G. D. WOODY

3,427,650

DECORATOR

Filed Jan. 5, 1966

Sheet 1 of 3

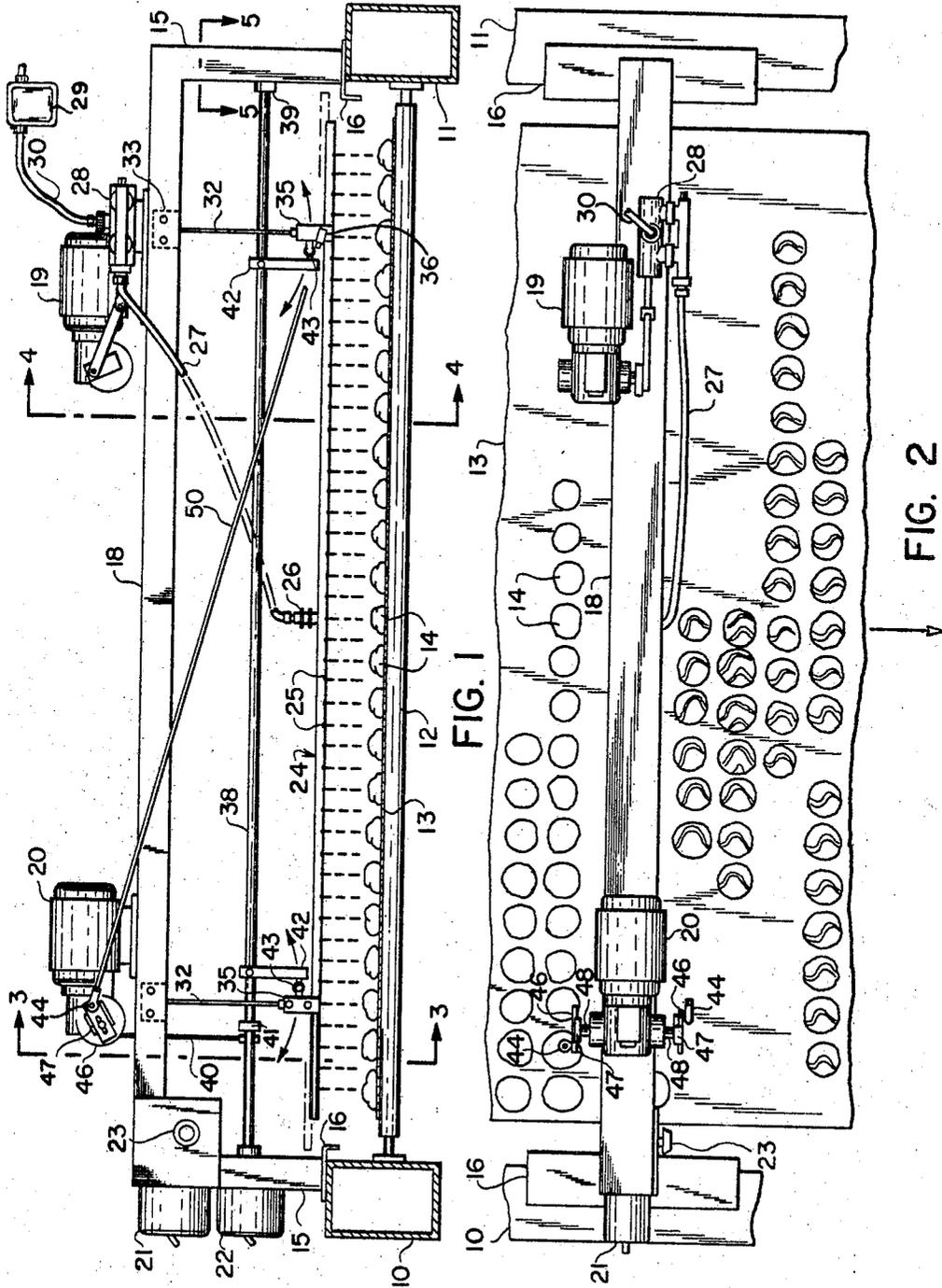


FIG. 1

FIG. 2

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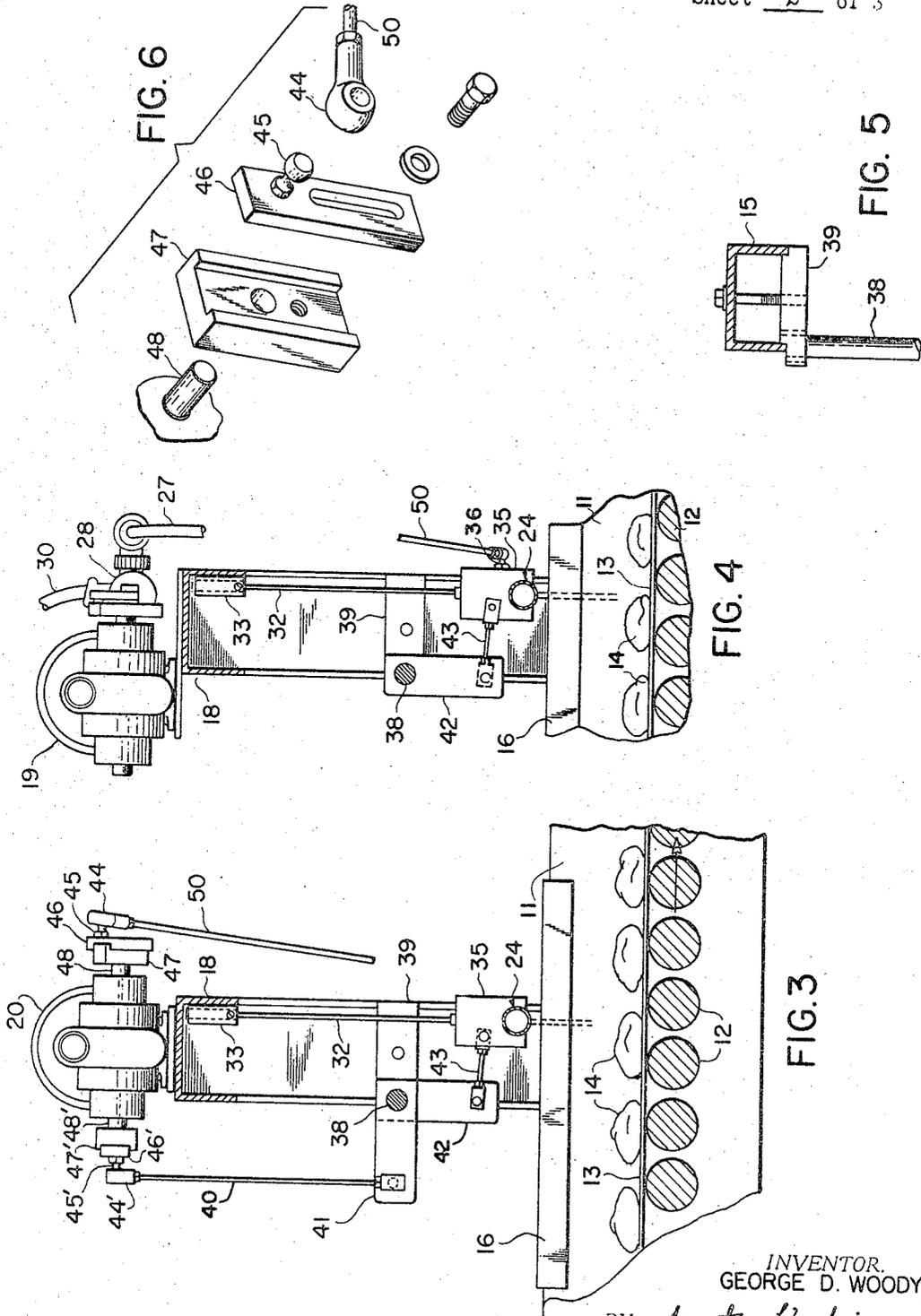
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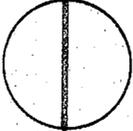
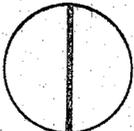
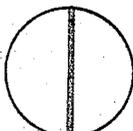
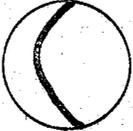
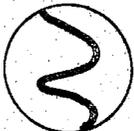
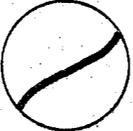
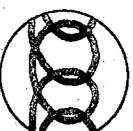
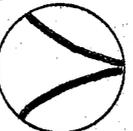
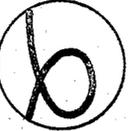
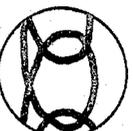
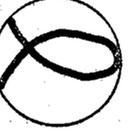
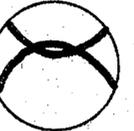
Stroke Distance (Inch)		Stroke Speed		
Across Belt	With Belt	Slow	Medium	Fast
0	0			
1/2	0			
1	0			
1/2	1/2			
1	1/2			
1/2	1			
1	1			

FIG. 7

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Int. Cl. A21c 9/00; A23a 1/20

7 Claims

ABSTRACT OF THE DISCLOSURE

A decorator for imparting designs on the surfaces of candies, confections, and cookies, comprising a continuously moving conveyor for carrying the item to be decorated, an elongate tube extending across the conveyor and defining a plurality of orifices through its lower surface, a pump for urging a decorating liquid into the tube and through the orifices, and means for selectively moving the tube laterally of and/or longitudinally of the conveyor path at various speeds.

While certain novel aspects of the present inventive concept may be applicable in the surface decoration of numerous types of articles, the invention is more particularly concerned with the surface decoration of candies and confections. Specifically, the decorator device is designed as an instrumentality to be attached to, or form a part of, a conveyor on which a plurality of candies or confections are continuously passed. The arrangement is such that the candies or confections are passed beneath the decorator device.

Among the novel features of the present invention is that of improved means to impart a wide variety of paths of motion to an interrelated group of nozzles or orifices for discharging streams of decorating material onto a plurality of continuously moving candies, confections, or the like. As a result a large number of decorative patterns may be formed on the candies or confections by the streams of decorating material.

Another feature of the present invention is that it may be readily combined with existing equipment of the character set forth.

Other novel features of the present invention relate to the structure and design of the decorator device which is readily adjustable for a wide variety of patterns of decoration while being well designed to meet the demands of economic manufacture.

Numerous other objects, features and advantages of the present invention will be apparent from a consideration of the following specification taken in conjunction with the accompanying drawings in which:

FIG. 1 is a vertical sectional view of one form of the present invention as applied to conventional confection conveyors;

FIG. 2 is a fragmentary top plan view of the present invention as disclosed in FIG. 1;

FIG. 3 is a fragmentary vertical sectional view taken along lines 3-3 of FIG. 1;

FIG. 4 is a similar vertical section taken along line 4-4 of FIG. 1;

FIG. 5 is a detail horizontal section taken along line 5-5 of FIG. 1;

FIG. 6 is an exploded view illustrating one of the adjustable crank arrangements for the motor used to impart motion to the nozzles or orifices in the present invention;

FIG. 7 is an illustration of some of the various design patterns which may be produced by the use of the present apparatus.

Referring now to the specific structural details of the drawings, it will be seen from FIGS. 1 and 2 that the

conveyor mechanism comprises a pair of transversely spaced longitudinal base rails 10 and 11 between which are supported a plurality of parallel transverse rolls 12 over which a continuous supporting belt or foraminous screen 13 travels. A group of articles to be decorated, such as the confections as indicated by the numeral 14, are continuously conveyed on the surface of the belt or screen.

The decorator device of the present invention includes a frame comprising a pair of vertical uprights 15 having base support plates 16 which freely rest on the upper surface of the rails 10 and 11. The frame is completed by a transverse beam 18 which extends between the upper ends of the uprights 15. By providing a frame of this structure the decorator device may be positioned anywhere along the longitudinal axis of the conveyor mechanism.

As an additional feature, the base support plates 16 may be so constructed as to permit the frame to be moved to a limited extent transversely with respect to the conveyor mechanism while still being supported upon rails 10 and 11. The device shown in FIG. 1 is capable of such movement by having the flanges of the base support plates 16 separated by a shorter distance than the distance between the side rails 10 and 11.

It will of course be understood that the present invention is not concerned with the structural details of the conveyor mechanism, which may vary from that suggested by the present drawings. Thus, it is to be noted that the decorator device is designed for ready adaptation to a wide variety of conveyors. Furthermore, the structural details herein set forth, as to the support and mounting of the device, may be widely varied consistent with the concepts of the present invention.

A dispensing member 24 is suspended in close proximity to, but vertically spaced above the conveyor 13. The suspension system comprises flexible cables 32, or the like, secured at their upper ends to the transverse beam 18 by means of suspension blocks 33 and at their lower ends to clamping blocks 35 which in turn hold the dispensing member. While only two such suspension systems are shown it should be understood that others could be provided if necessary or desired.

The dispensing member, itself, comprises a tube closed at both ends and having a plurality of spaced apart, in-line nozzles or orifices along its lowermost peripheral surface. A conventional fluid coupling 26 is mounted on the tube so that fluid decorating material may be supplied to the interior of tube and thereafter be dispensed through the plurality of orifices onto the moving articles supported by the conveyor below.

The decorating material is supplied to the coupling 26 from a suitable source (not shown) by a pump 29. Between the pump and the coupling the fluid decorating material passes through hose 30, strainer 28, and hose 27 which is connected to the coupling. The strainer 28 is, preferably, of the self-cleaning type and is operated by motor 19 mounted on the top of the frame. An off-on switch 22, mounted on the side of the frame, is used to control the motor 19.

Self-cleaning strainers are described in copending application, Ser. No. 60,327, filed Oct. 4, 1960, now Patent No. 3,244,283.

Generally, decorating materials which are relatively immobile or extremely viscous at room temperatures but may be rendered relatively fluid at higher temperatures comprise those which are most desirably used with the present invention. These materials are, of course, heated by suitable means prior to being received by the pump or at least prior to being passed through the strainer. In some instances heating must be accomplished using great care so as not to adversely affect the decorating material.

For example, chocolate may turn white on overheating or being subjected to warm temperatures over a period of time.

The decorating material is caused to be deposited in a variety of patterns upon the continuously moving articles on the conveyor 13 by providing the dispensing member 24 with the capability of various movements or combinations thereof. The suspension system of the dispensing member is such that this movement is permitted.

A single driving motor 20 is employed to impart all movements to the dispensing member. This motor may be controlled by an off-on switch 21 as well as a rheostat 23 to vary its speed.

The motor 20 is capable of imparting a reciprocating motion to the dispensing member in a direction transverse to the conveyor 13 by means of a connecting link 50. As shown in FIG. 1, this link extends diagonally from the motor 20 to one of the clamping blocks 35 of the suspension system for the dispensing member 24. The link is connected to the clamping block by means of a pin or pintle 36 shown more clearly in FIG. 4.

A novel crank arrangement is employed to connect the link to a common drive shaft 48 of the motor. Specifically, this crank arrangement is shown in FIG. 6 and comprises a crank block 47 which mounts on the end of the shaft 48 for rotation therewith. The crank block has an outer recess in which a crank plate 46 may be mounted. The crank plate has a pintle 45 mounted at one end and a longitudinally extending slot in the remaining portion of the plate. The plate is adjustably mounted in the recess of the crank block by means of a bolt extending through the slot and threaded into the block. The upper end of the link 50 carries a connector 44 which mounts on the pintle 45 of the crank plate.

Thus, it should now be apparent that the dispensing member 24 may be transversely reciprocated with respect to the conveyor 13 by adjusting the crank plate in the recess of the crank block so that the link 50 is eccentrically mounted with respect to the drive shaft 48 of the motor 20. The amplitude of the reciprocation, of course, will depend upon the degree of eccentricity of the link mounting.

It should also be understood that by mounting the link 50 directly in line with the drive shaft 48 so that there is no eccentricity the dispensing member will remain stationary with respect to this transverse direction.

The motor 20 is further capable of imparting a reciprocating movement to the dispensing member in a direction parallel to the conveyor 13 as shown clearly in FIGS. 3 and 4. The means for providing this movement includes a control rod 38 rotatably mounted on the uprights 15 of the frame by bearing escutcheons 39, as shown in FIG. 5. A horizontal crank arm 41 is secured at one end to the control rod 38 in such a manner that movement of the crank arm causes the control rod to rotate in its bearings.

At the other end of the crank arm 41 is secured a vertical link 40 by means of a pin or pintle. The upper end of the link 40 is connected to a crank arrangement similar to that described with respect to link 50, with similar parts being designated with the same numeral with a prime added. However, this crank arrangement is mounted on the opposite end of the common drive shaft 48 from the first described crank arrangement.

Vertical crank arms 42 are mounted on the control rod 38 for rotation therewith and are connected at their lower ends to clamping blocks 35 by means of freely pivotal pitmans 43.

From the above-description it should be apparent that mounting the link 40 in eccentric relationship to the drive shaft 48 by means of the novel crank arrangement will cause the crank arm 41 to pivot about the control rod 38 thus producing an oscillating rotational movement in the control rod. This, in turn, causes the vertical crank arms 42 to oscillate thus producing a reciprocating motion in

the dispensing member 24 through the clamping blocks 35 and pitmans 43. The amplitude of the reciprocations is, of course, dependent upon the degree of eccentricity of the link 40 with respect to the drive shaft 48. The reciprocating movement in the dispensing member is in a direction parallel to the longitudinal axis of the conveyor 13.

In the event the link 40 is mounted on the crank arrangement in a non-eccentric relationship with the drive shaft 48 this type of reciprocating movement will be precluded.

Thus, it should be apparent that by adjusting the eccentricities of the links 40 and 50 on their respective crank arrangements secured at opposite ends of the drive shaft 48 of motor 20 a great many patterns of decorating material may be formed on the articles 14 by the dispensing member 24. Additional effects may also be produced through the use of the rheostat 23 in varying the speed of the motor 20.

Another provision of the present invention whereby the patterns of the decorating material may be varied is that of the relative positioning of the two crank arrangements on shaft 48 of motor 20 with respect to each other. As shown in FIGS. 1, 2 and 3, the crank arrangements are secured to shaft 48 in such a manner as to be 90° out of phase. It should be understood that the phase relationship may be set at any other value desired by merely adjusting the crank blocks 47 with respect to each other.

The number of patterns obtainable with the decorator device of the present invention are too numerous to describe or illustrate in detail, however, a sampling of the patterns is shown in FIG. 7. The left-hand column indicates various combinations of transverse and longitudinal reciprocation of the dispensing member while the various patterns obtained from each combination are shown in the right-hand column. In addition, the right-hand column illustrates the various effects obtained by varying the speed of the motor 20.

These patterns are formed on the individual articles 14 being conveyed beneath the dispensing member 24. These articles may be placed on the conveyor at random or geometrically arranged. Certain geometric arrangements of the articles will produce recurring patterns.

Since there are, oftentimes, spaces between the articles 14 a certain amount of decorating material may be deposited on the conveyor. This decorating material may be recovered and recirculated to the pump 29 by conventional means after the decorated articles have been removed from the conveyor.

Alternatively, the conveyor may be of a foraminous nature, such as a wire belt, wherein the decorating material passes through to the underside and is then collected and recirculated.

Thus, having described the present invention in terms of certain structural details it is to be understood that various changes and modifications may be made without departing from the spirit and scope of the invention and is to be limited only by the appended claims.

I claim:

1. A decorator for use in combination with an article carrying conveyor including, decorating material discharging means, means for supplying decorating material to said discharge means including a pump and a motor operated strainer, and means for moving said discharge means with respect to articles carried by said conveyor.

2. A decorator for use in combination with an article carrying conveyor including decorating material discharge means, means for supplying decorating material to said discharge means, and a motor having a pair of eccentric drive elements connected to said discharge means for imparting both transverse and longitudinal movement of the discharge means with respect to the conveyor.

3. A decorator as set forth in claim 2 in which said connections include means for independently varying their eccentricity.

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4. A decorator as set forth in claim 2 in which each eccentric drive connection imparts a separate motion to said discharge means.

5. A decorator for use in combination with an article carrying conveyor comprising decorating material discharge means including a transverse discharge pipe, a plurality of spaced decorating material discharge apertures in said pipe, and means for supporting said discharge pipe, said means including a transverse vertically spaced cross beam, a pair of opposed vertical uprights attached thereto, and flexible cables attached between said cross beam and said discharge pipe to freely suspend said pipe; means for supplying decorating material to said discharge pipe including a motor operated strainer mounted on said cross beam and a supply hose coupled between said discharge pipe and said strainer; and means for moving said discharge pipe with respect to articles carried on said conveyor including a motor mounted on said cross beam, eccentric drive connections mounted on said motor, connecting links engaging said connections for imparting transverse and longitudinal motion to said discharge pipe, and means for the variable control of the moving means, said control means including a rheostat for the variable control of the speed of motion of said discharge pipe.

6. A decorator as set forth in claim 5 wherein the eccentric drive connections mounted on said motor have means for variably adjusting the eccentricity wherein a variety of positions may be provided including a non-eccentric position.

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7. A decorator for use in combination with an article carrying conveyor comprising a decorating material discharge means including a discharge member having a plurality of orifices therein, supporting means including a transverse cross beam vertically spaced above said discharge member, a pair of uprights attached to the ends of said cross beam for connection to the sides of the conveyor, and flexible support members attached between said cross beam and said discharge member, means for moving said discharge member with respect to the conveyor, and means for supplying decorating material to said discharge member.

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U.S. Cl. X.R.

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