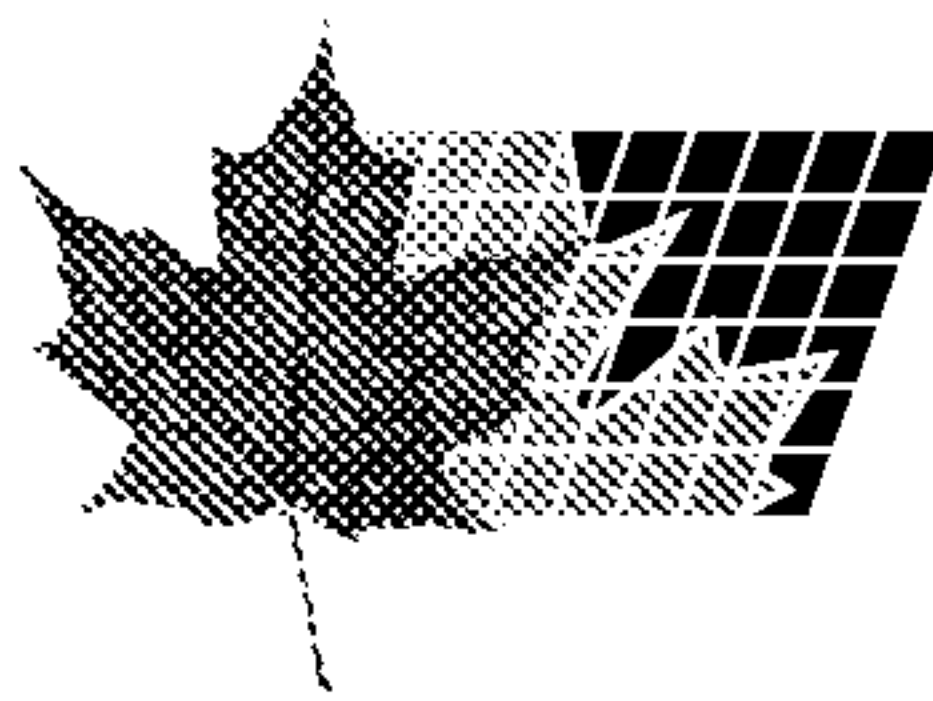




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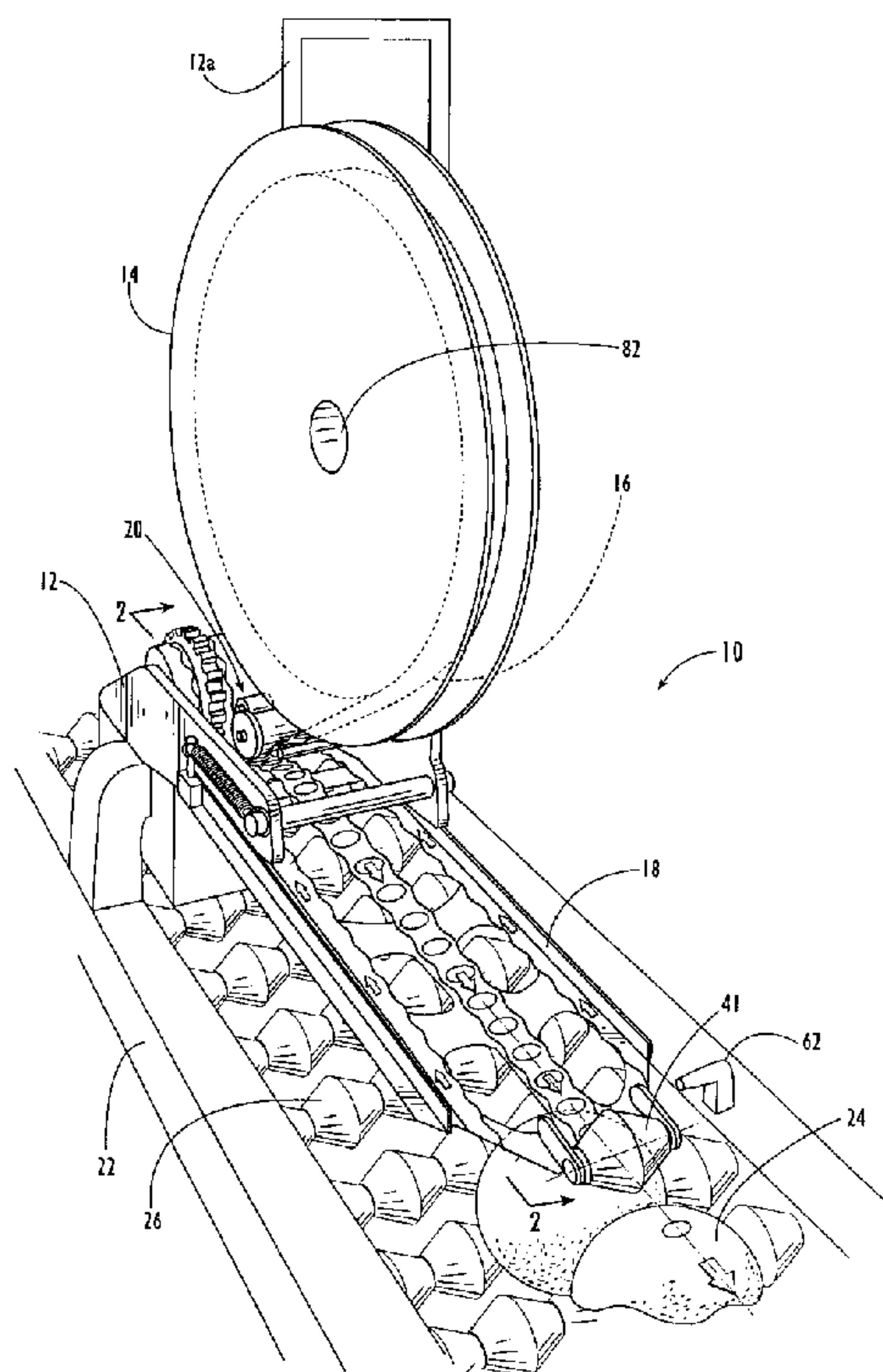
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(51) Int.Cl.<sup>7</sup> B65C 3/00

(30) 1999/05/13 (09/311,227) US

(54) **APPLICATEUR D'ETIQUETTES SUR LES FRUITS OU LES  
LEGUMES ET METHODES CONNEXES**

(54) **WIPE-ON LABEL APPLICATOR FOR FRUIT OR VEGETABLES  
AND ASSOCIATED METHODS**



(57) A labeler includes a frame, a label cassette connected to the frame for dispensing a label strip including a carrier and a plurality of labels adhered thereon, a conveyor for advancing fruit or vegetables along a predetermined path of travel, a label applicator arm pivotally connected to the frame adjacent the label cassette, and a label feeder for advancing the label strip along the label applicator arm to a free end thereof. The label applicator arm pivotally extends outwardly from the label cassette along the predetermined path of travel so that the free end of the label applicator arm contacts the fruit or vegetable. The label applicator arm includes a V-shaped notch in the free end thereof, and a resilient roller adjacent the V-shaped notch for pressing separated labels onto the fruit or vegetables. The V-shaped notch separates the labels from the carrier to be applied to the fruit or vegetables as the carrier passes through the V-shaped notch. The discarded carrier portions are withdrawn by the label feeder. The label applicator arm includes at least one spring for biasing the label applicator arm toward the conveyor, and a damper for damping movement thereof.

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**WIPE-ON LABEL APPLICATOR FOR FRUIT OR VEGETABLES  
AND ASSOCIATED METHODS**

**Abstract of the Disclosure**

A labeler includes a frame, a label cassette connected to the frame for dispensing a label strip including a carrier and a plurality of labels adhered thereon, a conveyor for advancing fruit or vegetables  
5 along a predetermined path of travel, a label applicator arm pivotally connected to the frame adjacent the label cassette, and a label feeder for advancing the label strip along the label applicator arm to a free end thereof. The label applicator arm  
10 pivotally extends outwardly from the label cassette along the predetermined path of travel so that the free end of the label applicator arm contacts the fruit or vegetable. The label applicator arm includes a V-shaped notch in the free end thereof, and a resilient  
15 roller adjacent the V-shaped notch for pressing separated labels onto the fruit or vegetables. The V-shaped notch separates the labels from the carrier to be applied to the fruit or vegetables as the carrier passes through the V-shaped notch. The discarded  
20 carrier portions are withdrawn by the label feeder. The label applicator arm includes at least one spring for biasing the label applicator arm toward the conveyor, and a damper for damping movement thereof.

WIPE-ON LABEL APPLICATOR FOR FRUIT OR VEGETABLES  
AND ASSOCIATED METHODS

Field of the Invention

The present invention relates to labelers, and, more particularly, to a wipe-on labeler.

Background of the Invention

Labels are typically applied to fruits and  
5 vegetables in packing houses. The speed at which these  
labels are applied is important because the fruit must  
be packed and shipped quickly so that the shelf-life in  
stores will be as long as possible. Generally, the  
speed at which the labeler dispenses the labels is a  
10 limiting constraint. This constraint also results in  
an inefficient use of other equipment and personnel in  
the packing house, thus increasing the overall cost of  
packing fruits and vegetables. Accuracy of applying  
the labels is also another important factor. Ideally,  
15 a hit rate of 100% is desirable. When the hit rate is  
less, a label is not successfully applied to a fruit.  
Packing house profitability is adversely affected when  
a label that would have permitted a higher selling  
price is not applied to fruit otherwise capable of  
20 commanding such a higher price.

Labelers generally apply pressure sensitive  
labels using a continuous label strip carrying a

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plurality of labels for application to the fruit as it is conveyed past the labeler. However, many existing labelers require stiffness in the labeling material, and consequently, paper or laminated labels have to be pre-cut to lay properly on the fruit. Accordingly, vinyl labels may be preferred because they are thin and flexible and more easily conform to any fruit shape, and the adhesion to the fruit is thus better. Unfortunately, applying such labels at high speed may be difficult.

A number of techniques have been developed to attempt to increase the speed and accuracy of labelers. For example, U.S. Patent No. 4,217,164 to La Mers discloses a bellows type labelling system using pressure sensitive labels attached along a label strip that includes a line of weakness down its middle forming separable halves, with the labels attached over both halves. The label strip is pulled along a plate towards a V-shaped notch in one edge of the plate. At the notch, the two halves of the label strip are drawn through the V-shaped notch with each half over a different side of the V. This causes the two halves of the label strip to follow divergent paths from each other, and also from the label, forcibly releasing the label.

A significant advance in the art of applying vinyl labels is disclosed in U.S. Patent No. 5,829,351 to Anderson et al., inventors of the present invention. The disclosed labeler includes a bellows drive gear and a cassette drive gear spaced apart and each rotatably supported in a housing. A stepper motor is mounted in the housing and has an output shaft. A first drive gear is affixed to the shaft and engages the bellows drive gear. A second drive gear is affixed to the shaft. A drive train engages the second gear and the cassette drive gear. Because there is a direct connection between the drive of both the bellows wheel

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and the cassette, a full bellows cycle is available to accurately effect the transfer of a label from the label strip to the end of the individual bellows.

U.S. Patent No. 5,660,676 to Brooks discloses  
5 a wipe-on labeler with a peel blade for separating the labels from the carrier strip. Similarly, U.S. Patent Nos. 3,793,114 and 4,017,350 to Thomas disclose a wipe-on labelling machine that dispenses adhesive labels from a label strip that includes supply and collector  
10 reels, a pivotal rocker arm carrying an application roller, and an adjustable guide member disposed between the reels and the roller so that the labels on the label strip are peeled therefrom by movement of the label strip around the guide member. A pawl is  
15 rockable about the same pivot axis as the pivotal rocker arm for applying pressure against the label strip. The pawl provides a ratcheting index technique for advancing the labels. Accordingly, this labeler is difficult to operate at higher speeds because the  
20 ratcheting pivotal rocker arm must swing through a predetermined working stroke before a label is advanced.

Other wipe-on labelling machines that dispense adhesive vinyl labels include labelers  
25 manufactured by Hurst Labeling Systems, PROLABEL, and Booth Auto Pak. The PROLABEL labeler includes an adjustable speed D.C. stepper motor, and an electronic eye sensor for detecting fruit location. These labelers feed the label strip over a flat edge of the  
30 applicator arm, which unfortunately may lack accuracy in placing the labels onto the fruit.

#### Summary of the Invention

In view of the foregoing background, it is therefore an object of the present invention to provide  
35 a labeler and associated method that improves the speed

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and accuracy at which labels are applied to fruit or vegetables.

This and other advantages, features and objects in accordance with the present invention are provided by a wipe-on labeler comprising a frame, a label cassette connected to the frame for dispensing a label strip including a carrier and a plurality of labels adhered thereon, a conveyor for advancing fruit along a predetermined path of travel, a label applicator arm pivotally connected to the frame adjacent the label cassette, and a label feeder for advancing the label strip along the label applicator arm to a free end thereof. Because the fruit labeler is a wipe-on labeler, it is less complex than rotary and reciprocating type labelers, and can accordingly place labels at a relatively high speed.

The label applicator arm pivotally extends outwardly from the label cassette, preferably along the predetermined path of travel so that the free end contacts the fruit. The label applicator arm preferably has a V-shaped notch in the free end for separating from the carrier the label to be applied to the fruit as the carrier passes through the V-shaped notch, and is divided into two carrier waste portions. The carrier waste portions are withdrawn by the label feeder.

The label applicator arm also preferably includes a resilient roller attached to the free end adjacent the V-shaped notch for pressing against the fruit. The V-shaped notch advantageously removes the label from the carrier, and the resilient roller presses the label onto the fruit as it rolls over the fruit. This allows the dispensing of vinyl labels, which conform to fruit better than paper or laminated labels. Consequently, the accuracy or hit rate of the labeler according to the present invention is improved

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when vinyl labels are dispensed because they more readily conform to the shape of the fruit.

The label feeder also preferably includes a pair of take-up wheels for respectively taking up the pair of carrier waste portions after being split by the V-shaped notch. Because the carrier halves both support the label, if the labeler dispenses a label when there is no fruit, the label desirably stays on one of the waste portions and is discarded.

The label strip preferably has at least one edge with a predetermined profile, and the label feeder includes a dispensing wheel having a similar corresponding profile.

The label applicator arm preferably includes at least one spring for biasing the label applicator arm toward the conveyor, and a damper for damping pivotal movement thereof when contacting fruit having significant size differences. These above described aspects according to the present invention allow the speed of the labeler to be significantly faster than conventional wipe-on labelers.

Another aspect of the present invention relates to a method of applying labels to fruit using a labeler having a frame, and a label applicator arm pivotally connected to the frame and extending outwardly along a predetermined path of travel so that a free end of the label applicator arm contacts the fruit. The method preferably includes the steps of advancing a label strip using a label feeder along the label applicator arm to the free end thereof, and separating from a carrier of the label strip a label to be applied to the fruit as the carrier passes through a V-shaped notch.

#### Brief Description of the Drawings

FIG. 1 is a perspective view of the labeler in accordance with the present invention.

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FIG. 2 is a top plan view of a portion of the label strip for the apparatus shown in FIG. 1.

FIG. 3 is a bottom plan view of a portion of the label strip for the apparatus shown in FIG. 1.

5 FIG. 4 is an enlarged view of a portion of the apparatus as shown in FIG. 1.

FIG. 5 is a top plan view of the apparatus shown in FIG. 1 with the cassette removed to better illustrate the label applicator arm.

10 FIG. 6 is a greatly enlarged bottom plan view of the free end of the label applicator arm in accordance with the present invention.

#### Detailed Description of the Preferred Embodiments

The present invention will now be described  
15 more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should  
20 not be construed as limited to the embodiments set forth herein. Rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art. Like numbers refer to like elements throughout.

25 Referring initially to FIG. 1, a perspective view of a fruit labeler, generally indicated at 10, is described in accordance with the present invention. The fruit labeler 10 includes a frame 12, a label cassette 14 connected to the frame for dispensing a  
30 label strip 16, a label applicator arm 18 pivotally connected to the frame adjacent the label cassette, and a label feeder 20 for advancing the label strip along the label applicator arm to a free end thereof. The label feeder is generally indicated by reference 20,  
35 which will be described in greater detail below.

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The frame 12 is supported and advanced by a conveyor 22, which advances fruit 24 along a predetermined path of travel as will be appreciated by those skilled in the art. The label applicator arm 18  
5 extends outwardly from the label cassette 14 along the predetermined path of travel so that the free end of the label applicator arm contacts the fruit 24. The conveyor 22 preferably has conventional cradles 26 for holding and positioning individual fruit 24. Other  
10 methods of advancing fruit 24 along the predetermined path of travel are acceptable, as will be readily appreciated by one skilled in the art.

The label strip 16 has a carrier 30 and a plurality of labels 32 adhered thereon, as best shown  
15 in FIGS. 2 and 3. The labels 32 are preferably vinyl since vinyl labels are thin and flexible and more easily conform to a variety of fruit shapes than paper or laminated labels. The adhesion to the fruit 24 is better because of this conformity. However,  
20 application of the labeler 10 according to the present invention is not limited to vinyl labels, as will be readily appreciated by one skilled in the art.

Each of the labels 32 has a front face 32a with a decorative design or other identifying indicia  
25 printed thereon. The label strip 16 includes a separation line 34 along its length at a middle portion thereof. Preferably, the separation line 34 is perforated but may be a line of weakness as well. The label strip 16 also has at least one edge 36 with a  
30 sinusoidal or other predetermined profile which facilitates accurate positioning, as will be described in more detail below.

Now referring additionally to FIGS. 4-6, the labeler 10 is described in greater detail. The label

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feeder 20 advances the label strip 16 along the label applicator arm 18 to the free end thereof. The label feeder 20 includes a cassette gear 48, a dispensing wheel 50, a pair of take-up wheels 52, and a drive shaft 54 coupled therebetween. The cassette gear 48 is rotated by a stepper motor 60. The stepper motor 60 is also part of the label feeder 20, and is activated or energized for rotating the cassette gear 48 responsive to a fruit sensing switch 62 positioned adjacent the conveyor 22. The fruit sensing switch 62 detects the approach of fruit 24 in the cradles 26 on the conveyor 22.

The stepper motor 60 is mounted within a housing 66 attached to the frame 12, and has an output shaft 68 with a drive gear 70 attached thereto. The drive gear 70 meshes with a first idler gear 72 rotatably mounted in the housing 66. A second idler gear 74 is attached to the idler gear 72 and meshes with a cassette drive gear 76. The cassette drive gear 76 is rotatably mounted in the housing 66 with its teeth projecting through and above a protective cover secured to the top of the housing to engage the cassette gear 48 within the frame 12. To accommodate labels of different sizes, the second idler gear 74 is removably secured to the first idler gear 72 so that a gear with the number of teeth necessary to advance the label strip 16 the proper distance may be installed, as will be readily appreciated by one skilled in the art.

The cassette gear 48 is affixed to the drive shaft 54, as is the dispensing wheel 50 and the pair of take-up wheels 52. The dispensing wheel 50 has a predetermined profile corresponding to the profile of

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the label strip 16. More particularly, the dispensing wheel 50 has a depressed center defined by a pair of opposing sinusoidal side walls 80. The profile edges 36 of the carrier 30 are formed with a shape  
5 complementary to and engageable with the sinusoidal side walls 80.

The label strip 16 is wound on a core 82 which is rotatably supported on handles 12a formed on and extending upward from the frame 12. The label  
10 strip 16 is trained around a guide pulley 84 rotatably carried on a tension arm 86 which is loosely carried by the drive shaft 54. A second roller 88 rotatably carried by the tension arm 86 assures the label strip 16 engages the side walls 80 of the dispensing wheel  
15 50. A stepped shaft 90 extends across and is non-rotationally secured to the frame 12. A full diameter section of the stepped shaft 90 is engageable by the guide roller 84 to assure the carrier 30 remains within the side walls thereof. The full diameter section of  
20 the stepped shaft 90 also limits the downward travel of the guide roller 84. The guide roller 84 is biased downward by gravity to trap the label strip 16 therebetween, and stop momentum of the label strip and to maintain tension therein. As the label strip 16 is  
25 dispensed, it passes over a set of rollers 85 to provide a non-restricting path to the free end of the label applicator arm 18.

To reduce the amount of bouncing of the label applicator arm 18, particularly when the arm is dragged  
30 over two successive fruits having a significant size difference, biasing means and a damper 73 are connected to the label applicator arm 18. In one embodiment, the

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biasing means preferably includes a pair of springs 71 connected between the label applicator arm 18 and the frame 12. Depending on the amount of bias desired, only one spring 71 may be used. Other methods of  
5 biasing the label applicator arm 18 are acceptable, as will be readily appreciated by one skilled in the art. The damper 73, may also comprise a dashpot which cushions or dampens movement of the label applicator arm 18 to avoid damaging the fruit 24 when a label 32  
10 is applied thereto. In another embodiment, the damper is provided at least one spring adjacent one of the bias springs 71, and its size is about half the length of the bias spring, but larger in diameter. In an alternative embodiment of the label applicator arm 18,  
15 the biasing means, are provided without the damper 73.

As stated above, the free end of the label applicator arm 18 includes a V-shaped notch 40 formed by edges 40a, 40b to split the carrier 30 of the label strip 16 along the longitudinal separation line. The  
20 V-shaped notch 40 separates the labels 32 from the carrier 30 as the carrier passes over the respective edges 40a and 40b, as best shown in FIG. 6. As the label 32 is separated from the carrier 30, the respective carrier waste portions 30a, 30b pass briefly  
25 underneath the label applicator arm 18 and return along the upper surface on opposite sides of the label strip as shown in FIG. 5.

A resilient roller 41 is connected to the free end of the label applicator arm 16 via extension  
30 43 for pressing separated labels 32 onto the fruit 24. The roller 41 has an inverted V-shaped region which corresponds to the V-shaped notch 40 in the label

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applicator arm 18. The roller 41 is preferably a soft material, such as rubber, so as not to damage the fruit 24. As the label 32 is separated from the carrier 30, the roller 41 ensures that the separated label has  
5 adequate pressure for adhering to the fruit 24.

Each half of the separated carrier, i.e., the carrier waste portions 30a and 30b, pass along the upper surface of the label applicator arm 18 and around guide rollers 92 rotatably mounted by a shaft 94. Each  
10 waste portion 30a, 30b passes between the guide rollers 92 and the take-up wheels 52, and passes over the top of the take-up wheels. The take-up wheels 52 include a series of peripheral projections 98 which penetrate the respective carrier waste portions 30a, 30b of the  
15 carrier 30. A wedge 104 secured to the inside of each side of the frame 12 separates the respective carrier waste portions 30a, 30b from the projections 98 on the respective take-up wheels 52.

A bar 106 spans one end of the frame 12 and  
20 is engageable with a hook (not shown) formed in the housing 66. The bar 106 has enlarged diameter ends, the transition to which tends to center the housing 66 as it is connected to the frame 12. A spring-loaded detent (not shown) is mounted on each side of the frame  
25 12 and engages a recess on the frame to releasably retain the label cassette 14 in place. The label cassettes are interchangeable so that one cassette can be loaded off-line with a reel of label strips 16 while another cassette is operatively engaged with the  
30 labeler 10 to apply labels to the fruit 24.

Once the stepper motor 60 has been activated by the fruit sensing switch 62, the stepper motor

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accelerates from standstill to a rotational speed which causes the velocity of the labels 32 to match the speed at which they will be dispensed. Matching the speed can be determined by counting the rotations of an idler gear (not shown) engaging the conveyor. When the  
5 stepper motor 60 is deactivated, the labels 32 decelerate to a standstill. The acceleration or ramp-up of the stepper motor 60 from standstill, which is initiated by closing the fruit sensing switch 62, is a  
10 function of the speed of the conveyor 22, the distance between the cradles 26 carrying the fruit 24, and the maximum tensile force to which the label strip 16 may be subjected.

Another aspect of the present invention  
15 relates to a method of applying labels 32 to fruit 24 using a labeler 10 having a label applicator arm, 18 pivotally connected to a frame 12, and extending outwardly so that a free end of the label applicator arm contacts the fruit. The method preferably includes  
20 the steps of advancing a label strip 16 along the label applicator arm to the free end thereof, and separating a label 32 from a carrier 30 of the label strip to be applied to the fruit 24 as the carrier passes through the V-shaped notch 40 in the free end of the label  
25 applicator arm. The labeler 10 includes a dispensing wheel 50 having a predetermined profile, and the label strip has at least one edge 36 with a corresponding profile of the dispensing wheel. The method further includes the step of engaging the profile of the label  
30 strip 16 to the profile of the dispensing wheel 50.

Because the label strip 16 and the dispensing wheel 50 have corresponding profiles, a precise and repeatable location of the label 32 is known every

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time, which improves the accuracy of dispensing labels to almost 100%. This avoids the use of a more costly electronic edge detector for providing a location of the labels. With the label applicator arm 18 including  
5 at least one spring 71 for biasing the label applicator arm toward the conveyor 22, and a damper 73 for damping movement of the label applicator arm when dragged over sequential fruits 24 having a significant size difference, the speed of the labeler 10 is  
10 significantly faster than conventional wipe-on labelers.

Many modifications and other embodiments of the invention will come to the mind of one skilled in the art having the benefit of the teachings presented  
15 in the foregoing descriptions and the associated drawings. Therefore, it is to be understood that the invention is not to be limited to the specific embodiments disclosed, and that modifications and embodiments are intended to be included within the  
20 scope of the appended claims.

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## THAT WHICH IS CLAIMED IS:

1. A labeler comprising:  
a frame;  
a label cassette connected to said frame for  
5 dispensing a label strip comprising a carrier and a  
plurality of labels adhered thereon;  
a conveyor for advancing fruit or vegetables  
along a predetermined path of travel;  
a label applicator arm pivotally connected to  
10 said frame adjacent said label cassette and extending  
outwardly from said label cassette along the  
predetermined path of travel so that a free end of said  
label applicator arm contacts the fruit or vegetable,  
said label applicator arm having a V-shaped notch in  
15 the free end thereof for separating from the carrier  
the labels to be applied to the fruit or vegetable as  
the carrier passes through the V-shaped notch and is  
divided into two carrier waste portions; and  
a label feeder for advancing the label strip  
20 along said label applicator arm to the free end  
thereof, and for withdrawing the two carrier waste  
portions.

2. A labeler according to Claim 1, wherein  
the label strip has at least one edge with a  
predetermined profile; and wherein said label feeder  
comprises a dispensing wheel having a corresponding  
5 profile to engage the predetermined profile of the  
label strip.

3. A labeler according to Claim 2, wherein  
the predetermined profile is sinusoidal.

4. A labeler according to Claim 1, wherein  
said label feeder comprises a pair of take-up wheels  
for taking up the respective carrier waste portions.

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5. A labeler according to Claim 4, wherein each take-up wheel includes a series of peripheral projections for piercing respective carrier waste portions.

6. A labeler according to Claim 1, wherein said label feeder further comprises a sensor for sensing a position of each fruit or vegetable along the predetermined path of travel and advancing the label  
5 strip responsive thereto.

7. A labeler according to Claim 1, further comprising a damper connected to said label applicator arm for damping pivotal movement thereof.

8. A labeler according to Claim 1, further comprising biasing means for biasing the free end of said label applicator arm toward said conveyor.

9. A labeler according to Claim 8, wherein said biasing means comprises at least one spring connected between said frame and said label applicator arm.

10. A labeler according to Claim 1, further comprising a resilient roller connected to the free end of said label applicator arm adjacent the V-shaped notch for pressing separated labels onto the fruit or  
5 vegetable.

11. A labeler according to Claim 10, wherein said resilient roller has an inverted V-shape corresponding to the V-shaped notch in the free end of said label applicator arm.

12. A labeler according to Claim 1, wherein the plurality of labels are vinyl.

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13. A labeler according to Claim 1, wherein said label feeder comprises: a dispensing wheel; a pair of take-up wheels; a stepper motor and a gear train connected thereto for rotating said dispensing wheel  
5 and said pair of take-up wheels.

14. A labeler according to Claim 13, wherein said label feeder further comprises a common drive shaft connected to said gear train and mounting said dispensing wheel and said pair of take-up wheels; and  
5 wherein said pair of take-up wheels have a diameter larger than a diameter of said dispensing wheel to provide tension to the carrier waste portions.

15. A labeler comprising:  
a frame;  
a label cassette connected to said frame for dispensing a label strip comprising a carrier and a  
5 plurality of labels adhered thereon, the label strip having at least one edge with a predetermined profile;  
a label applicator arm pivotally connected to said frame adjacent said label cassette and extending outwardly from said label cassette so that a free end  
10 of said label applicator arm contacts fruit or vegetables advanced therepast, said label applicator arm having a V-shaped notch in the free end thereof for separating the from the carrier labels to be applied to the fruit or vegetable as the carrier passes through  
15 the V-shaped notch and is divided into two carrier waste portions; and  
a label feeder comprising a dispensing wheel for advancing the label strip along said label applicator arm to the free end thereof, and for  
20 withdrawing the two carrier waste portions, said dispensing wheel having a corresponding profile to engage the predetermined profile of the label strip.

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16. A labeler according to Claim 15, wherein the predetermined profile is sinusoidal.

17. A labeler according to Claim 15, further comprising a conveyor for advancing fruit or vegetable along a predetermined path of travel past the free end of said label applicator arm.

18. A labeler according to Claim 15, wherein said label feeder comprises a pair of take-up wheels for taking up the respective carrier waste portions.

19. A labeler according to Claim 18, wherein each take-up wheel includes a series of peripheral projections for piercing respective carrier waste portions.

20. A labeler according to Claim 15, wherein said label feeder further comprises a sensor for sensing a position of each fruit or vegetable and advancing the label strip responsive thereto.

21. A labeler according to Claim 15, further comprising a damper connected to said label applicator arm for damping pivotal movement thereof.

22. A labeler according to Claim 17, further comprising biasing means for biasing the free end of said label applicator arm toward said conveyor.

23. A labeler according to Claim 22, wherein said biasing means comprises at least one spring connected between said frame and said label applicator arm.

24. A labeler according to Claim 15, further comprising a resilient roller connected to the free end

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of said label applicator arm adjacent the V-shaped notch for pressing separated labels onto the fruit or  
5 vegetable.

25. A labeler according to Claim 24, wherein said resilient roller has an inverted V-shape corresponding to the V-shaped notch in the free end of said label applicator arm.

26. A labeler according to Claim 15, wherein the plurality of labels are vinyl.

27. A labeler according to Claim 15, wherein said label feeder comprises: a dispensing wheel; a pair of take-up wheels; a stepper motor and a gear train connected thereto for rotating said dispensing wheel and said pair of take-up wheels.

28. A labeler according to Claim 27, wherein said label feeder further comprises a common drive shaft connected to said gear train and mounting said dispensing wheel and said pair of take-up wheels; and  
5 wherein said pair of take-up wheels have a diameter larger than a diameter of said dispensing wheel to provide tension to the carrier waste portions.

29. A method of applying labels to fruit or vegetable using a labeler comprising a label applicator arm pivotally connected to a frame and extending outwardly so that a free end of the label applicator  
5 arm contacts fruit or vegetables, the method comprising the steps of:

advancing a label strip along the label applicator arm to the free end thereof; and

separating from a carrier of the label strip  
10 a label to be applied to the fruit or vegetable as the carrier passes through a V-shaped notch in the free end

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of the label applicator arm and is divided into two carrier waste portions.

30. A method according to Claim 29, wherein the labeler further comprises a dispensing wheel having a predetermined profile; and wherein the label strip has at least one edge with a corresponding profile to  
5 the predetermined profile of the dispensing wheel; and wherein the method further comprises the step of engaging the profile of the label strip with the profile of the dispensing wheel.

31. A method according to Claim 29, further comprising the step of taking up the respective carrier waste portions of the carrier using a pair of take-up wheels.

32. A method according to Claim 31, wherein each take-up wheel includes a series of peripheral projections; and wherein the method further comprises the step of engaging the respective carrier waste  
5 portions with the series of peripheral projections.

33. A method according to Claim 29, further comprising the step of sensing a position of each fruit or vegetable for advancing the label strip responsive  
10 thereto.

34. A method according to Claim 29, further comprising the step of damping pivotal movement of the label applicator arm.

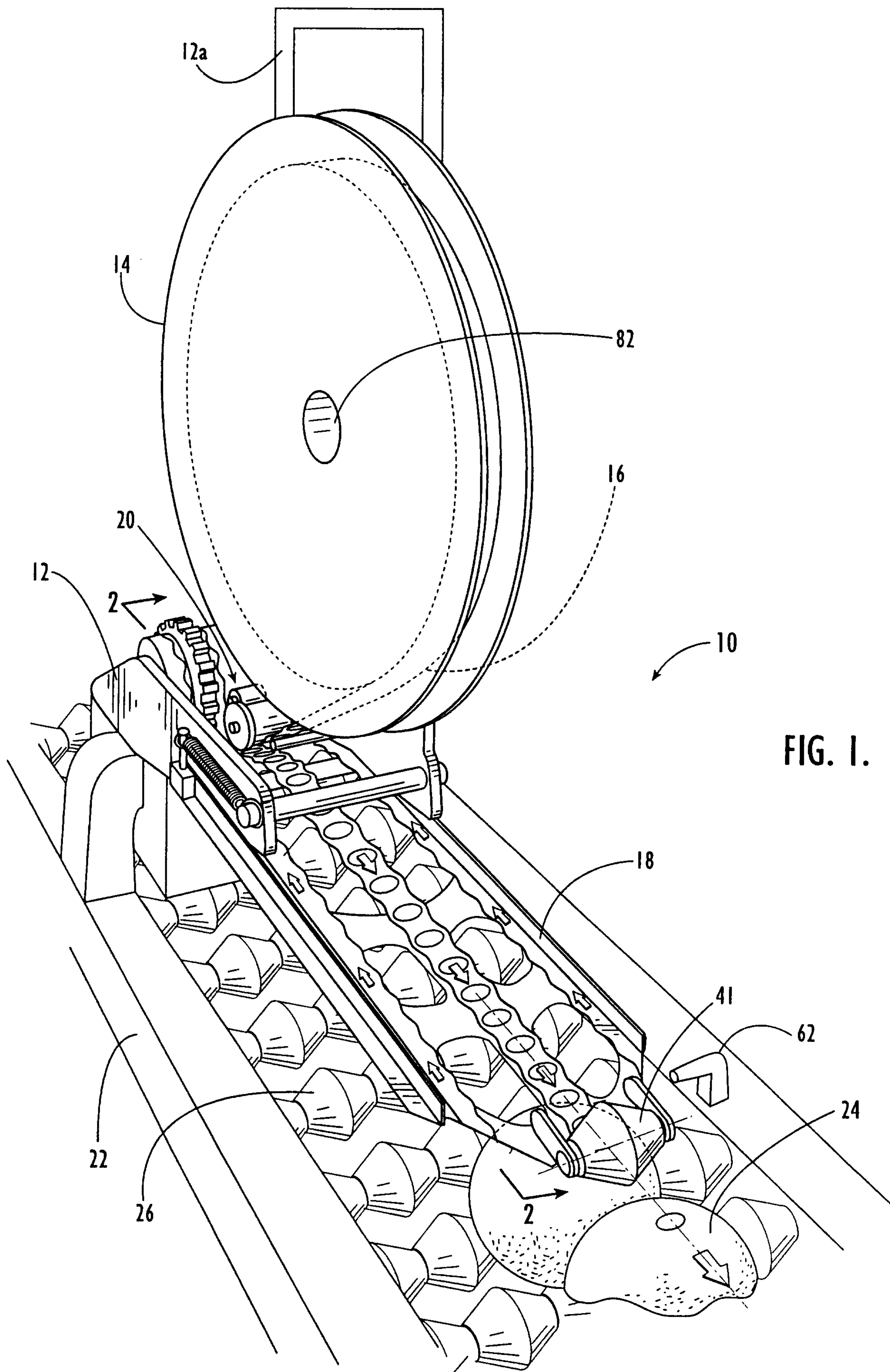
35. A method according to Claim 29, further comprising the step of biasing the label applicator arm toward a conveyor advancing the fruit or vegetable.

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36. A method according to Claim 29, wherein the label applicator arm further comprises a resilient roller, connected to the free end of the label applicator arm adjacent the V-shaped notch; and wherein  
5 the method further comprises the step of pressing separated labels onto the fruit or vegetable using the resilient roller.

37. A method according to Claim 36, wherein the resilient roller has an inverted V-shape corresponding to the V-shaped notch in the free end of the label applicator arm.

38. A method according to Claim 29, wherein the plurality of labels are vinyl.



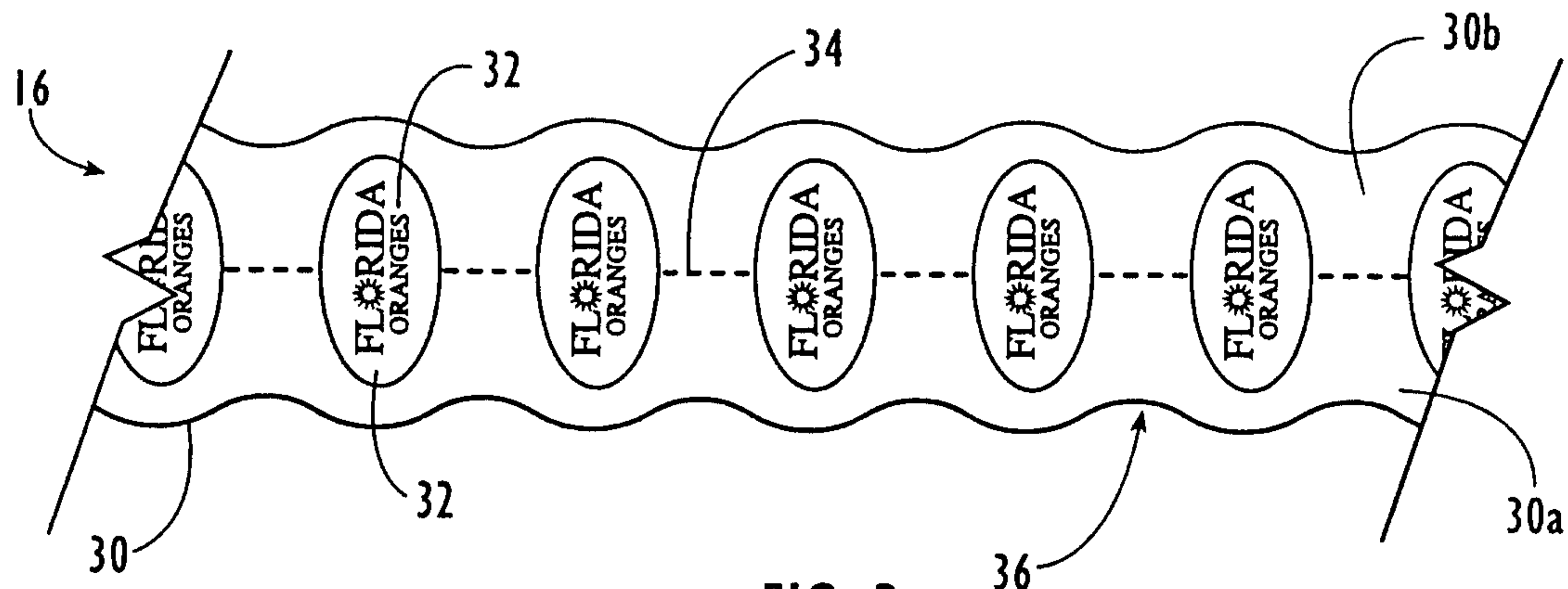


FIG. 2.

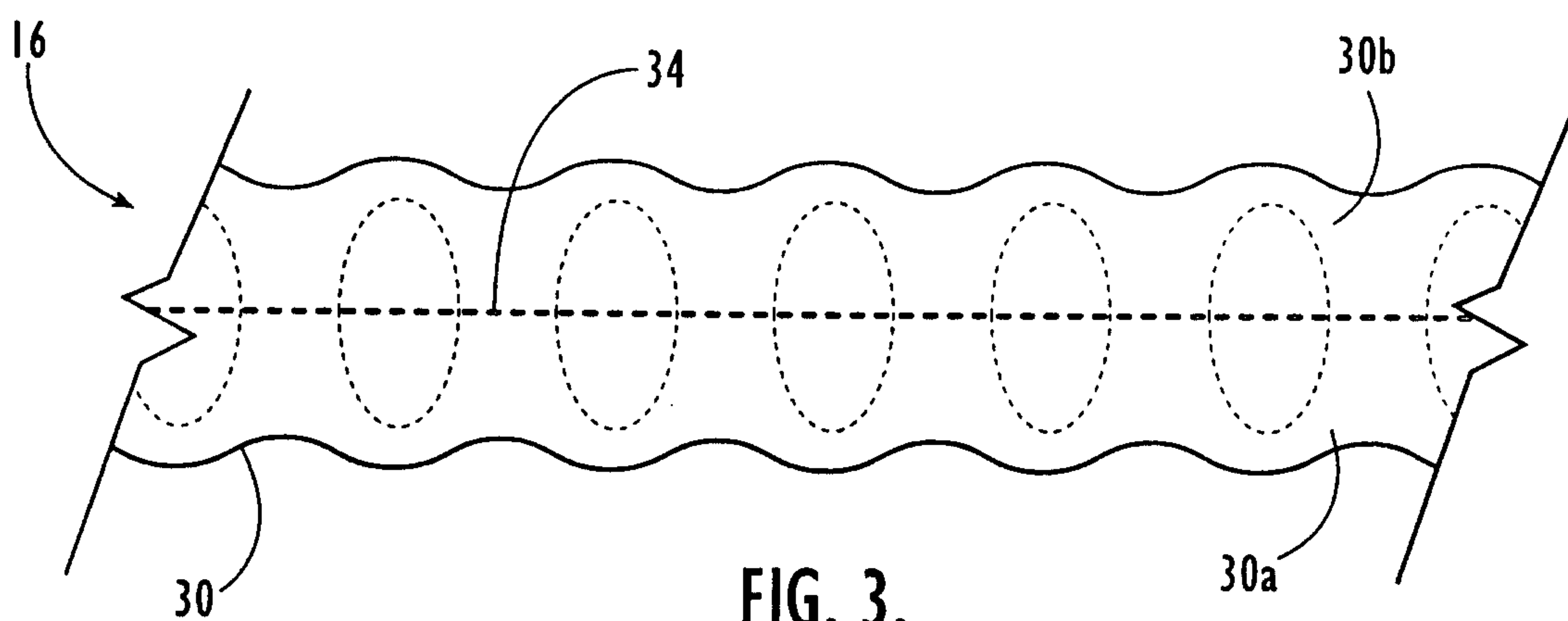


FIG. 3.

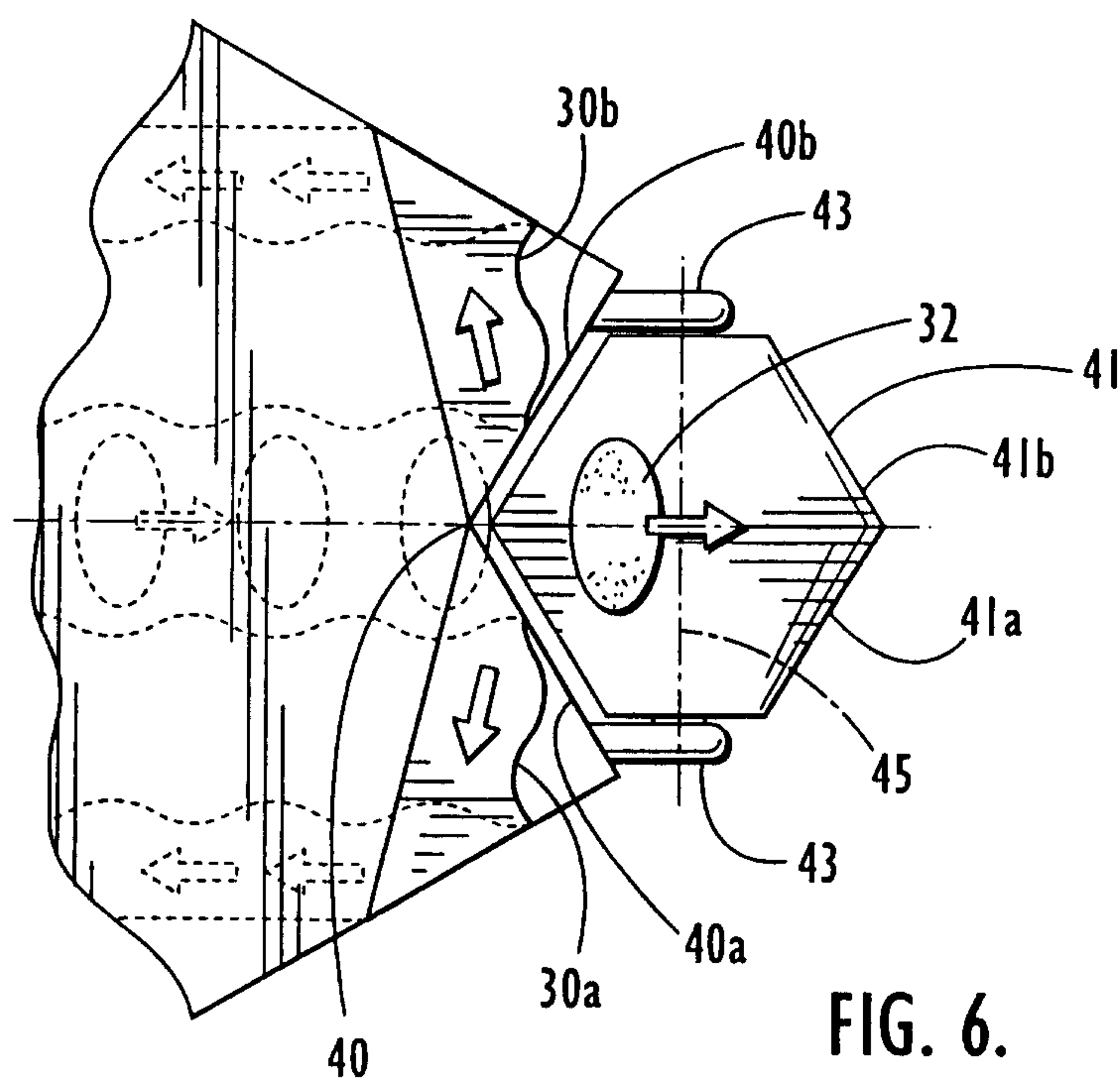
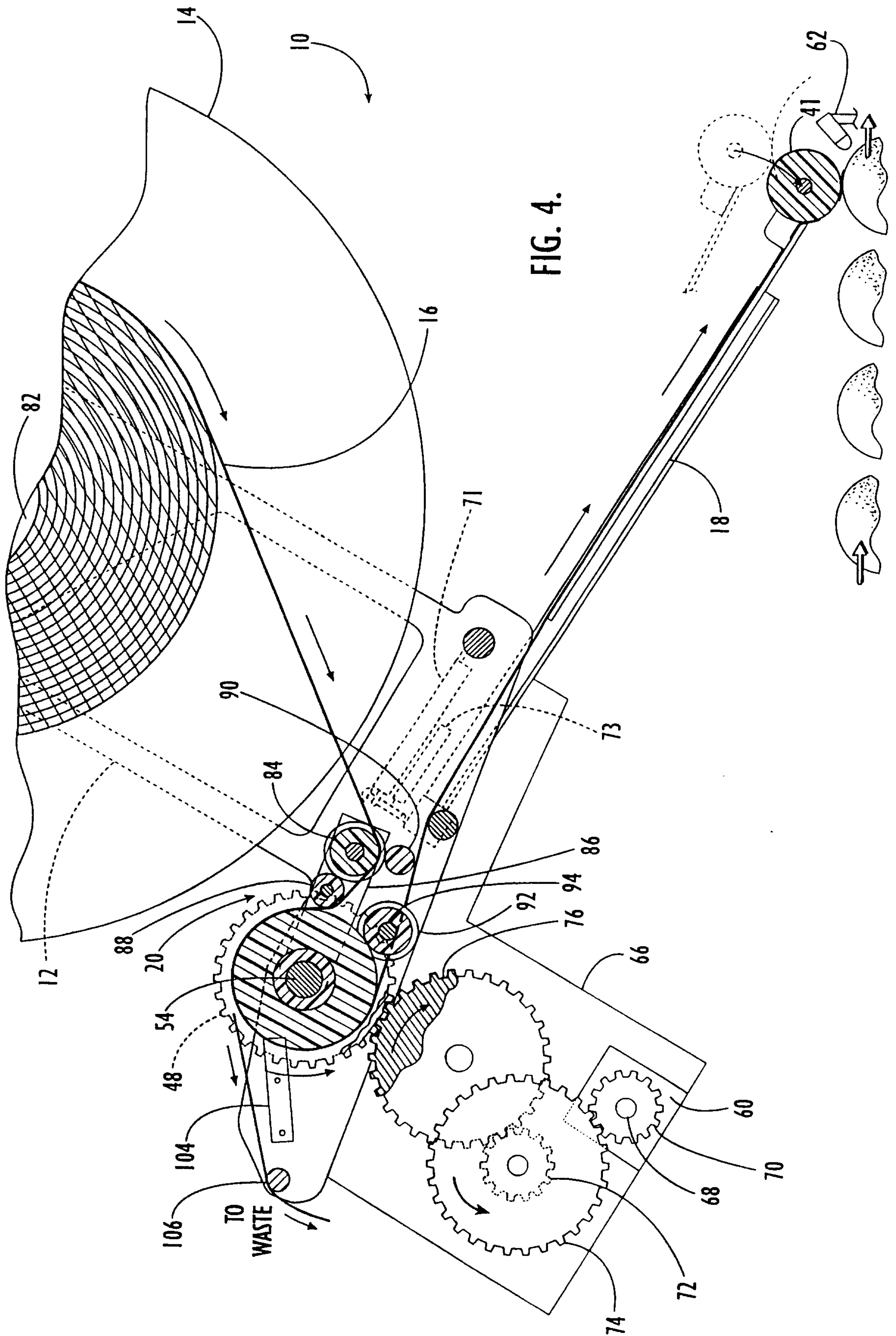


FIG. 6.



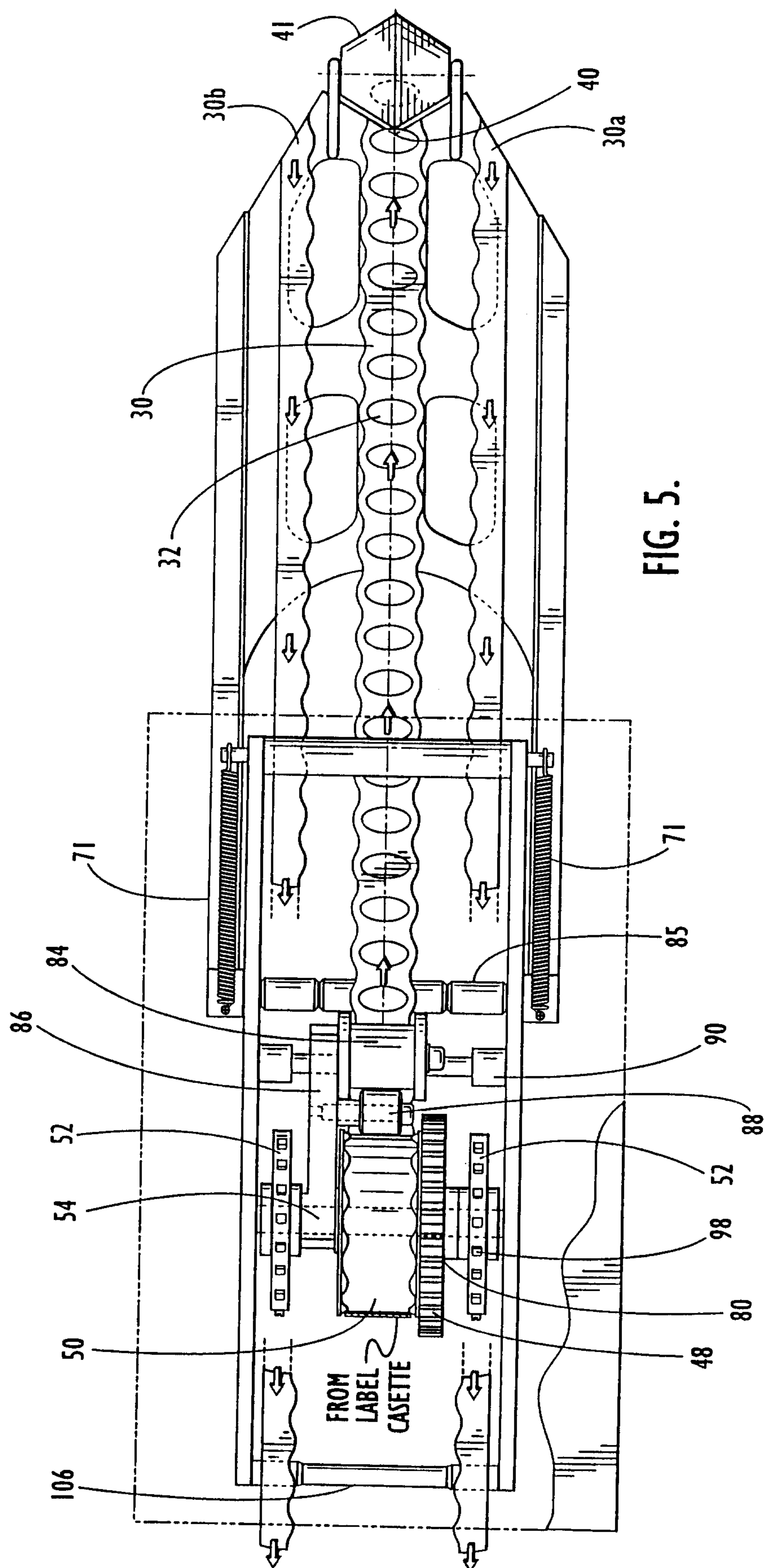


FIG. 5.

