



US00PP22159P3

(12) **United States Plant Patent**
Dozier, Jr. et al.(10) **Patent No.:** US PP22,159 P3
(45) **Date of Patent:** Sep. 27, 2011

- (54) **KIWI PLANT NAMED 'AU GOLDEN SUNSHINE'**
- (50) Latin Name: *Actinidia chinensis* Planch
Varietal Denomination: AU Golden Sunshine
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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.
- (21) Appl. No.: **12/711,194**
- (22) Filed: **Feb. 23, 2010**
- (65) **Prior Publication Data**
US 2011/0209255 P1 Aug. 25, 2011
- (51) **Int. Cl.**
A01H 5/00 (2006.01)
- (52) **U.S. Cl.** **Plt./156**
- (58) **Field of Classification Search** Plt./156
See application file for complete search history.
- (56) **References Cited**
- OTHER PUBLICATIONS**
- Wall et al. "Vegetative and Floral Chilling Requirement of Four New Kiwi Cultivars of *Actinidia chinensis* and *A. deliciosa*," (HortScience 43(3):644-647, Jun. 2008.)
Wall et al. "Determining a Maturity Index and the Effect of Chilling Requirements, and Cytokinin Application on Three New Kiwi Cultivars," Thesis—Degree of Master of Science, Auburn University, Aug. 2006, 87 pages.*
- * cited by examiner
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(74) *Attorney, Agent, or Firm* — Andrus, Sceales, Starke & Sawall, LLP
- (57) **ABSTRACT**
A new and distinct cultivar of the species *Actinidia chinensis* Planch is described. 'AU Golden Sunshine' has a low chilling requirement, fruit is early maturing, excellent flavor with a non acid sweet taste and a high percent soluble solids and dry matter content. 'AU Golden Sunshine' matures about 20 days after 'AU Golden Dragon' and 30 days before 'Hort 16A' (patented), the industry standard for golden flesh kiwi cultivars. 'Au Golden Sunshine' fruit quality indices are similar to fruit quality indices of 'AU Golden Dragon' and 'Hort 16A' (patented). There have been no differences in plant performance and fruit quality of 'AU Golden Sunshine' plants grown in China and Alabama.
- 6 Drawing Sheets**

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Latin name of the genus and species of the plant claimed:
Actinidia chinensis Planch.

Variety denomination: 'AU GOLDEN SUNSHINE'.

RELATED APPLICATIONS

U.S. Patent application Ser. No. 12/711,219, filed on Feb. 23, 2010, and entitled "KIWI PLANT NAMED 'AU GOLDEN DRAGON'" and U.S. Patent application Ser. No. 12/711,204, filed on Feb. 23, 2010, and entitled "KIWI PLANT NAMED 'AU GOLDEN TIGER'" are both incorporated by reference herein.

BACKGROUND OF THE INVENTION

'AU Golden Sunshine' is a golden fleshed cultivar of *Actinidia chinensis* Planch. This cultivar was selected from an *Actinidia chinensis* open pollinated seedling orchard that was tended and fruit harvested in Chongyang County of Hubei Province of P.R. China. The parentage of the new cultivar is unknown. 'AU Golden Sunshine' has been asexually reproduced in China and in Alabama, USA by rooting softwood and hardwood cuttings and by whip and cleft grafting. The genetics have been stable through succeeding asexual propagations. 'AU Golden Sunshine' fruit is large, cylindrical and uniform in shape with golden flesh that has a thick sweet

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flavor and delicious taste. 'AU Golden Sunshine' has high percent soluble solids and dry matter content which does not significantly differ from 'Hort 16A' (U.S. Pat. No. 11,066) (Table 1). 'AU Golden Sunshine' fruit ripens 30 days before 'Hort 16A' (patented), the industry standard for *Actinidia chinensis* cultivars. 'AU Golden Sunshine' fruit contains high levels of health promoting properties.

SUMMARY OF THE INVENTION

The present invention relates to a new and distinct early ripening yellow fleshed kiwi cultivar that produces cylindrical uniform shaped fruit with the stylar end rounded and the stalk end rounded and flat. The fruit skin is brown with short tomentose hairs at maturity.

The new cultivar is able to be asexually reproduced by softwood and hardwood cuttings or by grafting onto a seedling or rooted cutting grown rootstock. The unique characteristics come true to form and are established and transmitted through succeeding asexual propagations. 'AU Golden Sunshine' has been asexually propagated by rooting softwood and hardwood cuttings and by whip and cleft grafting in China and in Alabama, USA.

Kiwi plants are dioecious and have vegetative and compound buds with flower clusters produced in the leaf axils of the first four to six nodes. Male and female flowers are perfect

morphologically. The female flower contains some anthers but only the stigma is functional, whereas the flower on a male vine typically produces 125 to 185 large anthers that surround a small, vestigial stigma. In China, Jinxiong 2 (not patented), Kim Woong 3 (not patented), and Kim Woong 4 (not patented) are the male cultivars used as pollenizers. In Alabama 'AU Golden Tiger' is the male cultivar used as the pollenizer for 'AU Golden Sunshine'.

Kiwi buds enter endodormancy during winter, which requires a minimum number of chilling hours for maximum budbreak and bloom. Floral uniformity and density in spring is directly related to the amount of chilling received during winter. It is believed the more accurate measure of chilling hours is Richardson units, which are defined as the accumulated hours between 0° C. and 7° C.

For maximum bud break and flowering of 'AU Golden Sunshine' to occur it was determined that 700 hours of chilling was required and after the chilling requirement was met 15000 growing degree hours were necessary for bud break. The high growing degree hours requirement results in a late bud break and blooming period which occurs after the danger of late spring frost. 'AU Golden Sunshine' has performed well in central Alabama, which has an average winter chilling of 800-1200 hours.

In Alabama, 'AU Golden Sunshine' blooms later in the spring and its fruit ripens earlier in the fall than does 'Hort 16A' (patented). 'AU Golden Sunshine' has a cylindrical fruit shape as does 'Hort 16A' (patented). However, the stylar end is rounded in comparison to protruding stylar end of 'Hort 16A' (patented). The shape of the shoulder on the stalk end of 'AU Golden Sunshine' is rounded to flat in comparison to the rounded shape of 'Hort 16A' (patented). In Alabama, fruit of 'AU Golden Sunshine' matures September 10 in comparison to the fruit of 'Hort 16A' (patented) maturing October 10.

BRIEF DESCRIPTION OF THE DRAWINGS:

FIG. 1 is a photograph of 'AU Golden Sunshine' flower bud density on 8 year old plants.

FIG. 2 is a photograph of 'AU Golden Sunshine' close up of fruit on vine on 8 year old plants.

FIG. 3 is a photograph of 'AU Golden Sunshine' fruit load on vine on 8 year old plants.

FIG. 4 is a photograph of 'AU Golden Sunshine' flesh color on 8 year old plants.

FIG. 5 is a photograph of 'AU Golden Sunshine' fruit shape on 8 year old plants.

FIG. 6 is a photograph of a comparison of graded and sized fruit of 'AU Golden Sunshine' and 'Hort 16A' on 8 year old plants.

DETAILED BOTANICAL DESCRIPTION:

Kiwi plants are large deciduous shrubs that originated in China and are dioecious, can climb up to 25 feet, and have alternate, broadly rounded petiolate leaves. The cream colored flowers that grow in axillary cymes mature into ovate to oblong fruits (berries) with brownish, hairy skins. There are over 50 species in the genus *Actinidia*. The two *Actinidia* species of the most commercial importance are *deliciosa* and *chinensis*. 'Hort 16A' (patented) is the most important yellow flesh *chinensis* cultivar in the commercial trade. The kiwi plant is dioecious thereby requiring male pollenizers in the presence of the female plants to ensure fruit production. The male and female plants bloom period has to be at the same time for pollination to occur. The bloom period varies with

each cultivar depending upon the chilling requirement and the growing degree hour requirement after the chilling requirement has been met. *Actinidia* are temperate zone plants that prefer well drained moist and rich soil and grows as well in a sunny as in a half-shady position.

The new cultivar 'AU Golden Sunshine' is pistillate, with imperfect flowers, e.g. the flowers produce only sterile pollen and thus require a pollenizer for fruit production. The male cultivar 'AU Tiger' is the pollenizer used with 'AU Golden Sunshine'. The bloom period of 'AU Golden Sunshine' starts about April 20 which is 18 days after the 'Hort 16A' (patented) bloom period.

The new cultivar is able to be asexually reproduced by softwood and hardwood cuttings or by grafting or budding onto a seedling or cutting grown rootstock. The unique characteristics come true to form and are established and transmitted through succeeding asexual propagations.

The distinctive characteristics of this new kiwi cultivar described in detail below have been observed in field experiments in Alabama, USA and in China. The 'Hort 16A' (patented) cultivar was evaluated in the same field experiments in Alabama and was used as the standard cultivar for comparison.

The general fruit shape of 'AU Golden Sunshine' is cylindrical, whereas the general shape of 'Hort 16A' (patented) is ovoid. The general shape of the stylar end is rounded on 'AU Golden Sunshine' in comparison to a very protruding stylar end on 'Hort 16A' (patented). The fruit shoulder on the stalk end is rounded and flat on 'AU Golden Sunshine' and rounded on 'Hort 16A' (patented).

'AU Golden Sunshine' blooms with and is pollinized by 'AU Golden Tiger'. 'AU Golden Sunshine' is a companion and comparison fruiting cultivar to 'AU Golden Dragon'. The fruit of 'AU Golden Sunshine' matures 20 days after the fruit of 'AU Golden Dragon' and 30 days before the fruit of 'Hort 16A' (patented). Fruit quality is very similar between the three female cultivars, 'AU Golden Dragon', 'AU Golden Sunshine' and 'Hort 16A' (patented), however they differ in bloom date, fruit maturity date, and fruit shape.

'AU Golden Sunshine' is a good source of health promoting qualities such as vitamin C, antioxidant capacity, β carotene, and total phenolics (Table 2).

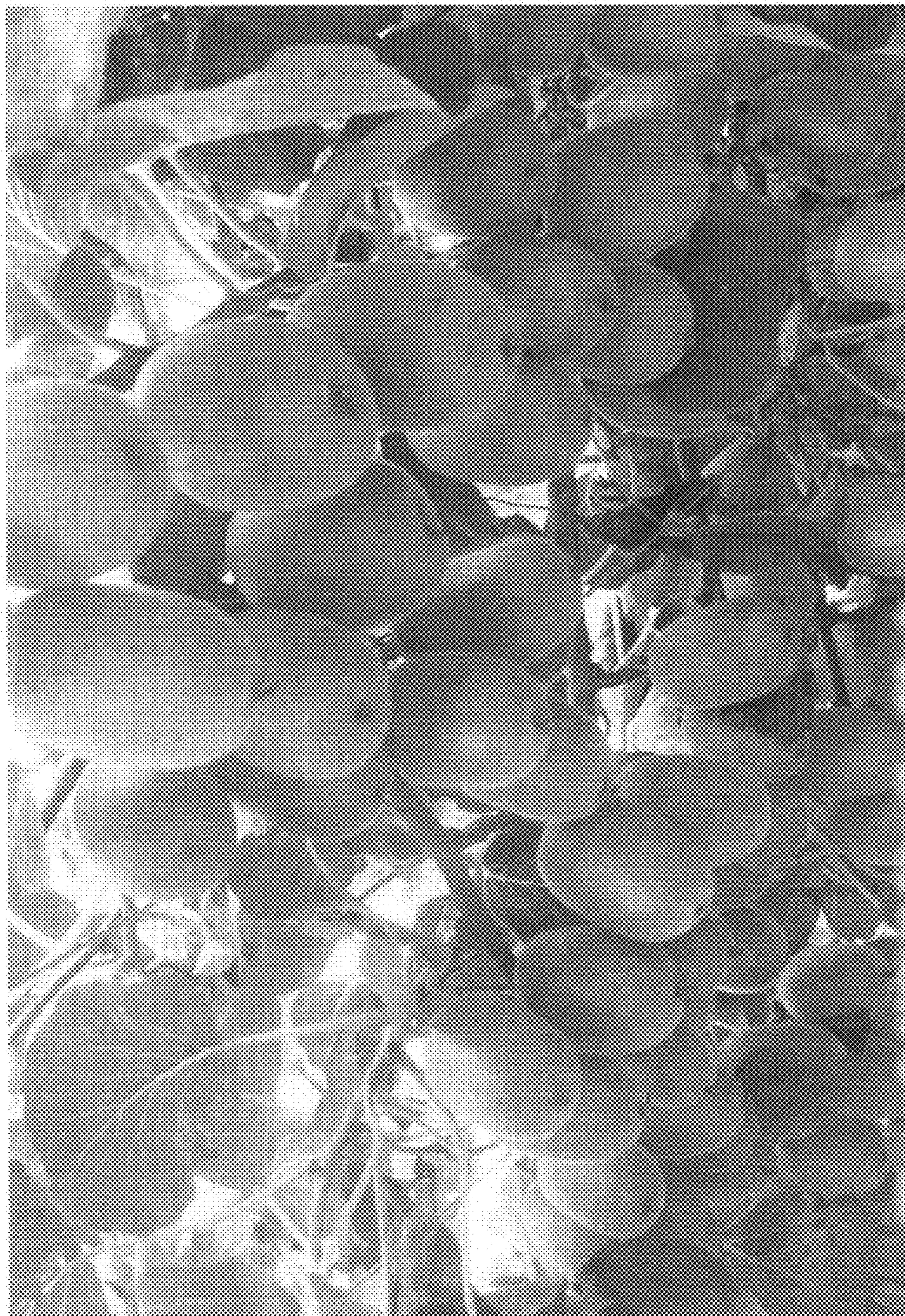
Table 3 below illustrates the specific differences between the 'AU Golden Sunshine' cultivar at 8 years of age and the 'Hort 16A' cultivar.

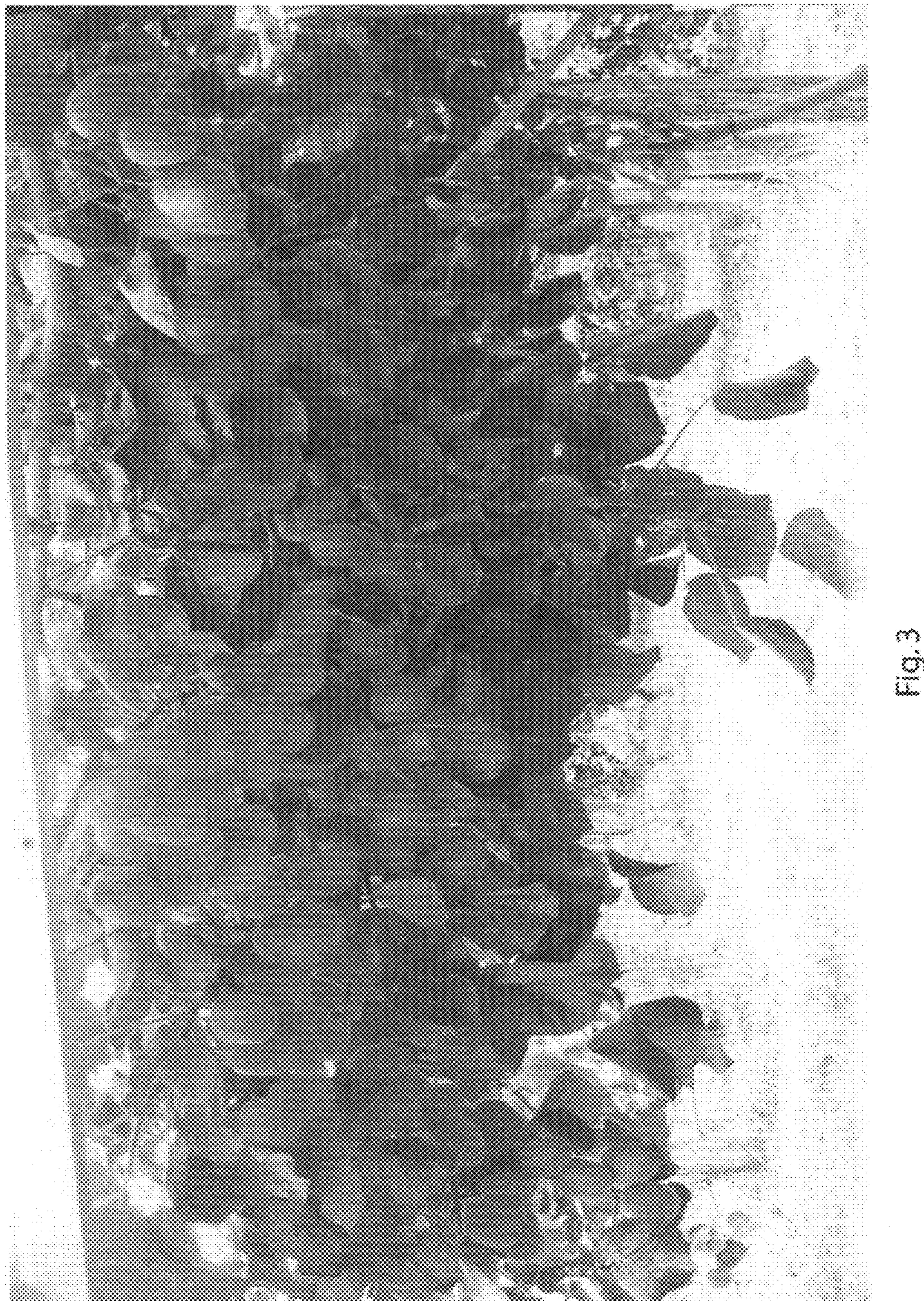
TABLE 3

	'AU Golden Sunshine'	'Hort 16A' (patented)
Plant		
Plant: sex expression	female (flowers imperfect)	
Plant: ploidy	diploid ($2n = 2x = 58$)	
Plant: vigor	strong	
Young shoot: hairs	present	
Young shoot: density of hairs	medium	
Young shoot: type of hairs	short	
Young shoot: anthocyanin coloration of growing tip	absent, N199A	
Young shoot: anthocyanin coloration of leaf axil	absent, N199A	
Plant: average height and spread	plant is a vigorous vine. They are grown on a trellis (either a T-bar or pergola trellis system) in which the plant is	



FIG. 1





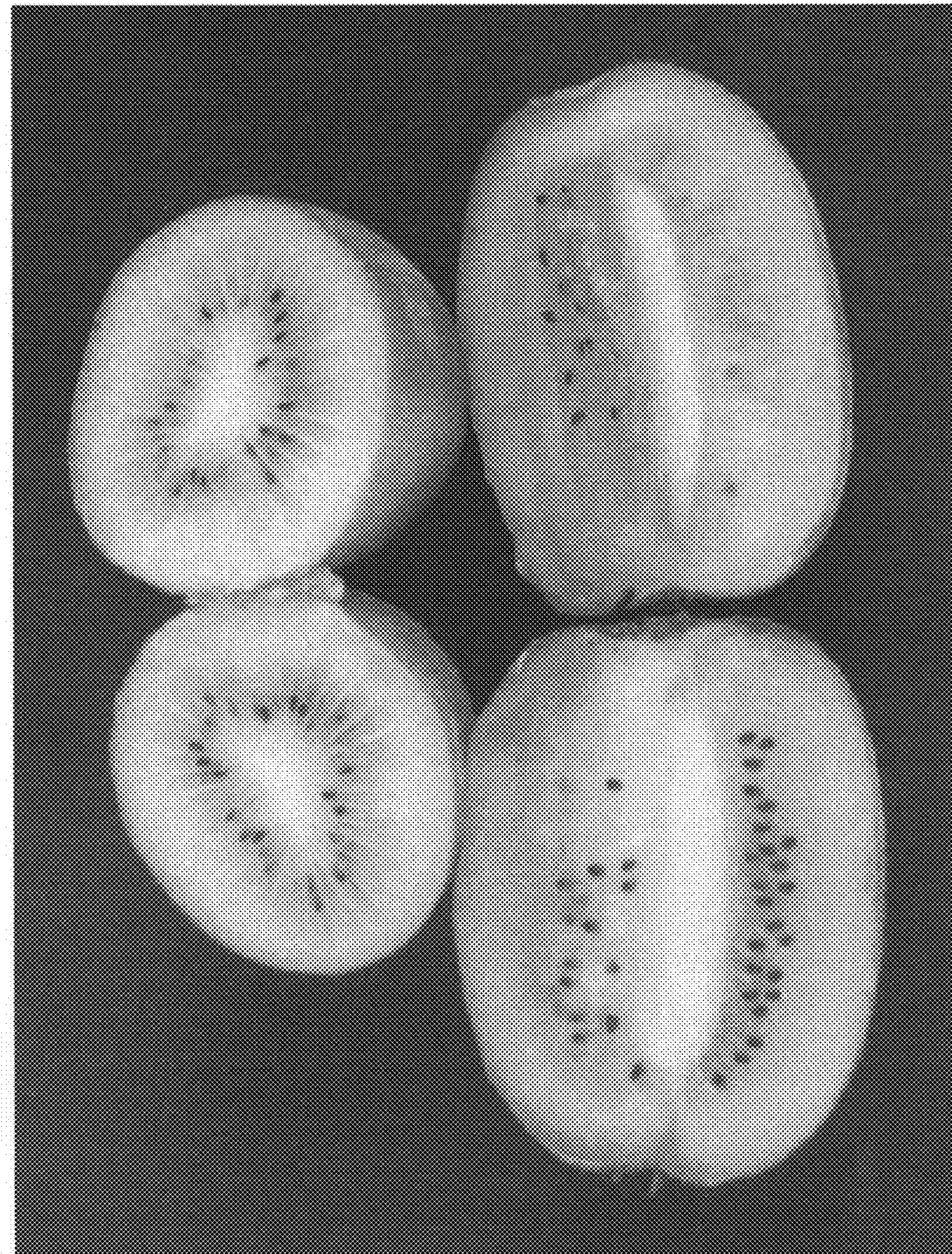
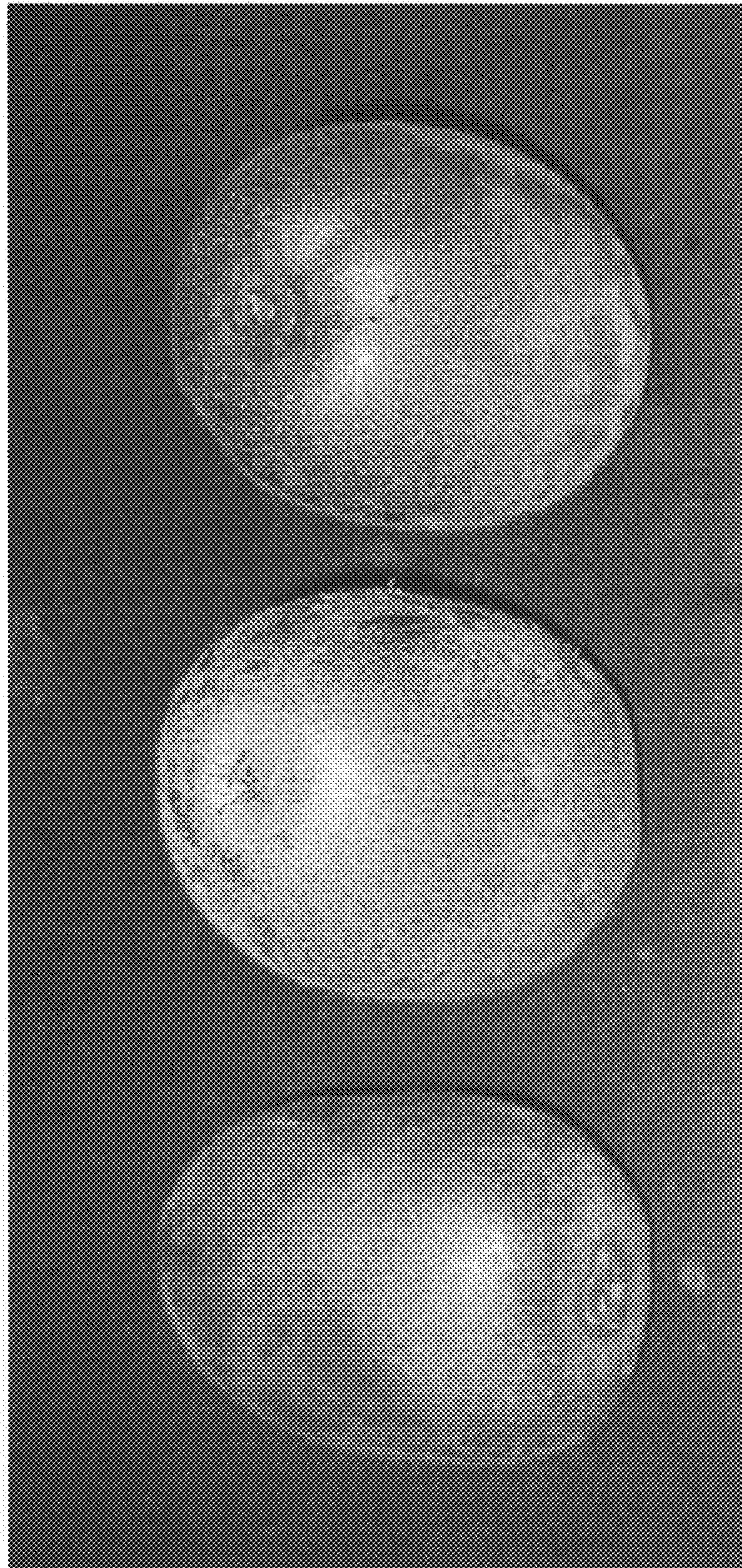


Fig. 4



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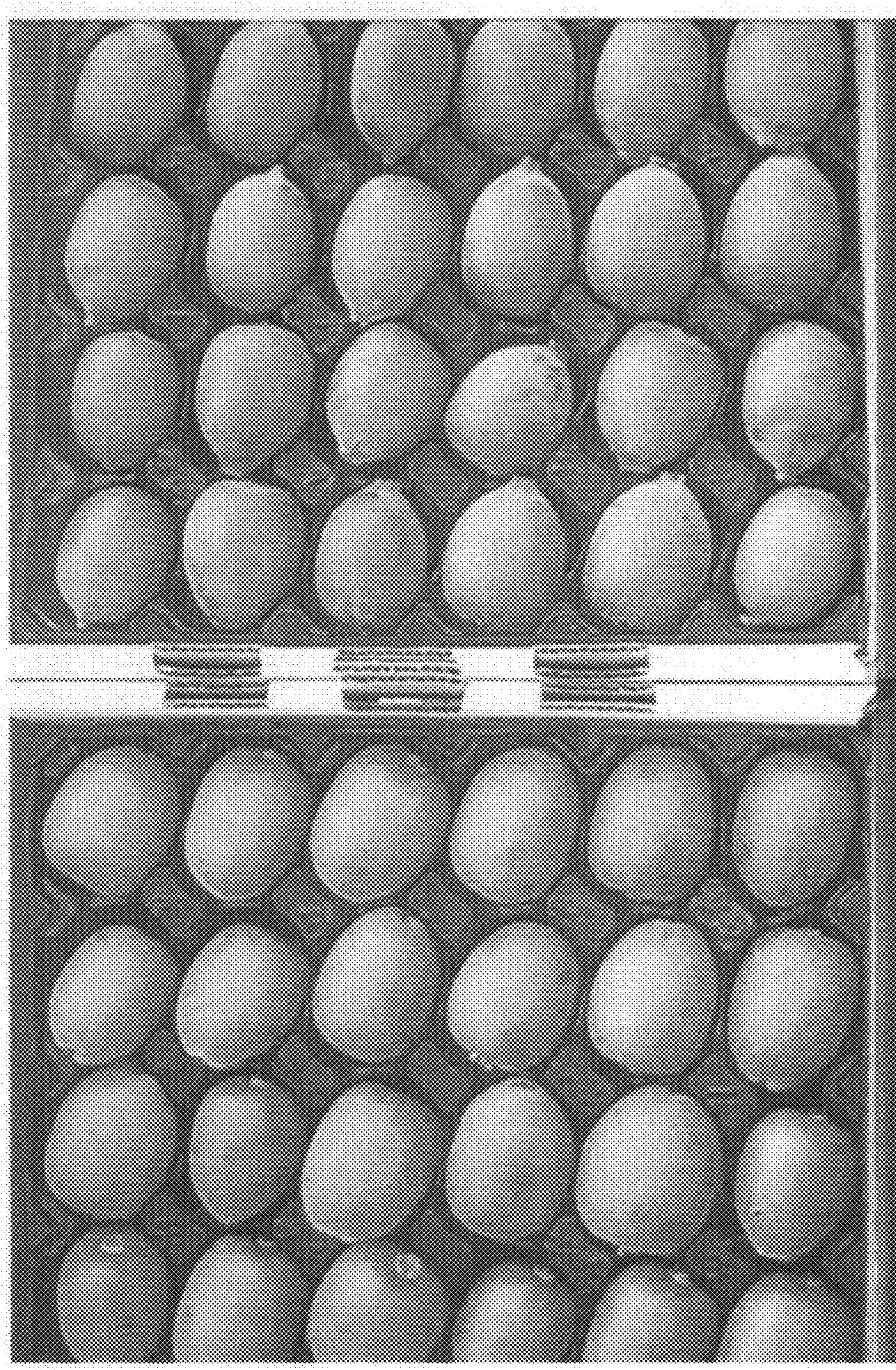


FIG. 6