

**(12) United States Plant Patent**
Nelson et al.**(10) Patent No.: US PP27,441 P3****(45) Date of Patent: Dec. 6, 2016****(54) STRAWBERRY PLANT NAMED ‘DILIGENT’****(71) Applicant: BERRY GENETICS, INC.**, Freedom, CA (US)**(72) Inventors: Steven D. Nelson**, Watsonville, CA (US); **Michael D. Nelson**, Watsonville, CA (US); **Leo W. Stoeckle**, Moorpark, CA (US)**(73) Assignee: Berry Genetics, Inc.**, Freedom, CA (US)**(*) Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 21 days.**(21) Appl. No.: 14/121,354****(22) Filed: Aug. 25, 2014****(65) Prior Publication Data**

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See application file for complete search history.*Primary Examiner — Annette Para***(74) Attorney, Agent, or Firm —** Foley & Lardner LLP**(57) ABSTRACT**

This invention relates to a new and distinct variety of strawberry plant named ‘DILIGENT’. This new strawberry plant named ‘DILIGENT’ is primarily adapted to the growing conditions of the central coast of California, and is primarily characterized by its large fruit size, small calyx, early fruit production, medium to small plant size, fruiting trusses held above the plant, and short fruiting trusses.

4 Drawing Sheets**1****BACKGROUND OF THE INVENTION**

The present invention relates to a new and distinct strawberry variety named ‘DILIGENT’. This new variety is a result of a controlled cross made in 2004 in an ongoing breeding program between strawberry variety designated ‘BG-959’ (U.S. Plant Pat. No. 17,864) and strawberry variety designated ‘BG-2010’ (a non-patented selection). Due to the combining of the reciprocal seed lots, it is unknown as to which parent variety is the seed parent and which parent variety is the pollen parent. The variety is botanically known as *Fragaria ananassa*.

The seedling resulting from the aforementioned cross was selected from a controlled breeding plot in Ventura County, California in the winter of 2006. After its selection, the new variety was asexually propagated by stolons in both Siskiyou County, California and San Joaquin County, California. The new variety was extensively tested over the next several years in fruiting fields in Ventura County, California. This propagation has demonstrated that the combination of traits disclosed herein as characterizing the new variety are fixed and remain true-to-type through successive generations of asexual reproduction.

BRIEF SUMMARY OF THE INVENTION

‘DILIGENT’ is primarily adapted to the climate and growing conditions of the central coast of California. The nearby Pacific Ocean provides the humidity and moderate temperatures needed to produce a strong, vigorous plant and maintain fruit quality during the winter and spring production months.

The following traits have been repeatedly observed and are determined to be unique characteristics of ‘DILIGENT’, which in combination distinguish this strawberry plant as a new and distinct variety:

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1. Large fruit size;
2. Small calyx;
3. Early fruit production;
4. Medium to small plant;
5. Fruiting trusses held above the plant; and
6. Short fruiting trusses.

The strawberry variety that is believed to be most closely related to the new variety ‘DILIGENT’ is ‘BG-959’ (U.S. Plant Pat. No. 17,864). In side-by-side comparisons to the similar strawberry variety ‘BG-959’, ‘DILIGENT’ differs by the following combination of characteristics as described in Table 1.

TABLE 1

Characteristic	‘DILIGENT’	‘BG-959’ (U.S. Plant Pat. No. 17,864)
Fruit: size (grams)	35.4 (large)	27.2 (medium)
Fruit: color of internal flesh	Medium red	Ranges from medium to dark red
Fruit: size of calyx relative to fruit diameter	Slightly smaller	Slightly larger
Fruit: hollow center expression	Absent or very weak	Ranges from moderate to strong
Plant: habit	Upright	Semi-upright
Plant: density	Ranges from medium to sparse	Medium
Foliage: color	Medium yellow green	Ranges from medium to dark green
Fruiting truss: anthocyanin intensity	Absent or very weak	Medium
Fruiting truss: position relative to foliage	Above	Level with

For identification, a series of molecular markers have been determined for this new variety.

‘DILIGENT’ differs from its parents, ‘BG-959’ and ‘BG-2010’ by the following combination of characteristics as described in Table 2.

TABLE 2

Characteristic	'DILIGENT'	'BG-959' (U.S. Plant Pat. No. 17,864)	'BG-2010'
Marketable yield (gm/plant)	1,098	1,058	900
Fruit size	Large	Medium	Ranges from medium to large
Plant size	Ranges from medium to small	Ranges from medium to small	Ranges from medium to large
Fruit color	Red	Red	Ranges from red to dark red

BRIEF DESCRIPTIONS OF THE PHOTOGRAPHS

The accompanying color photographs illustrate the overall appearance of typical specimens of the new strawberry variety 'DILIGENT' at various stages of development, as true as it is reasonably possible with color reproductions of this type. Color in the photographs may differ slightly from the color value cited in the botanical descriptions which accurately describe the color of 'DILIGENT'. The depicted plant and plant parts of the new strawberry variety 'DILIGENT' are approximately five to six months old. The photographs were taken in Ventura County, California.

FIG. 1 shows typical fruiting field characteristics of 'DILIGENT', taken in the month of April 2014;

FIG. 2 shows a close-up view of the typical leaf structure of 'DILIGENT', taken in the month of April 2014;

FIG. 3 shows typical mature and immature field fruit of 'DILIGENT', taken in the month of March 2014; and

FIG. 4 shows typical internal and external mature fruit characteristics of 'DILIGENT', taken in the month of March 2014.

DETAILED BOTANICAL DESCRIPTION

The new variety 'DILIGENT' has not been observed under all possible environmental conditions. The characteristics of the new variety 'DILIGENT' may vary in detail, depending upon variations in environmental factors, including weather (temperature, humidity and light intensity), day length, soil type and location. In addition, the characteristics of any parental variety or comparison variety included in Tables 3 through 9 of the present invention may vary in detail, depending upon variations in environmental factors, including weather (temperature, humidity and light intensity), day length, soil type and location.

The aforementioned photographs, together with the following description of the new variety 'DILIGENT', unless otherwise noted, are based on observations taken during the 2014 growing season in Ventura County, California. These measurements and ratings were taken from plants of 'DILIGENT' dug from a high-elevation nursery located in Siskiyou County, California during early October 2013 and planted approximately four to five days later in Ventura County, California. The approximate age of the observed plants is five to six months. Yield observations and fruit quality characteristics are averaged from five years of data collected from the 2010 through 2014 growing seasons. Flower measurements and characteristics are from secondary flowers unless otherwise noted. Fruit characteristics and measurements are from secondary fruit, unless otherwise noted.

Color terminology where noted follows The Royal Horticultural Society Colour Chart, London (2007).

The following Tables 3 through 9 describe fruit, plant, stolon, foliage, fruiting truss, flower, and pest and disease characteristics of the new strawberry 'DILIGENT'.

TABLE 3

FRUIT CHARACTERISTICS	
Characteristic	'DILIGENT'
Color of mature fruit	RHS 46B, red
Color of internal flesh	RHS 44A, medium red
Color of core	RHS 38A, light red
Fruit length (cm)	4.5
Fruit width (cm)	4.2
Fruit size	Very large
Fruit length/width ratio	1.07, slightly longer than broad
Calyx diameter (cm)	3.8
Average fruit weight (gm)	35.4
Achene color, shaded side	RHS 153B, yellow green group
Achene color, sun-exposed side	RHS 183A, greyed purple group
Achene weight (mg)	0.40
Average achenes per berry	396
Marketable fruit yield (gm/plant)	1,098
Predominant fruit shape	Conical
Difference in shapes between primary and secondary fruit	Moderate
Band without achenes	Absent or very narrow
Evenness of fruit surface	Even or very slightly uneven
Evenness of fruit color	Even or very slightly uneven
Fruit glossiness	Ranges from medium to strong
Insertion of achenes	Level with surface
Position of calyx attachment	Inserted
Attitude of sepals	Ranges from downward to outward
Size of calyx relative to fruit diameter	Slightly smaller
Adherence of calyx (when fully ripe)	Strong
Firmness of fruit flesh	Medium
Distribution of red color of the flesh	Marginal and central
Hollow center expression	Absent or very weak
Fruit flavor	Good
Soluble solids (% Brix)	7.6
Time of first flower	Early
Time of first harvest	Early
Harvest period	January to June
Harvest maturity	Early season
Type of bearing	Not remontant (short day)

TABLE 4

PLANT CHARACTERISTICS	
Characteristic	'DILIGENT'
Plant height (cm)	13.1
Plant spread (cm)	27.0
Plant size	Ranges from small to medium
Plant habit	Upright
Plant density	Ranges from sparse to medium
Plant vigor	Medium

TABLE 5

STOLON CHARACTERISTICS	
Characteristic	'DILIGENT'
Stolon color	RHS 146D, yellow green group
Stolon anthocyanin coloration	RHS 180D, greyed red group
Stolon anthocyanin intensity	Absent or very weak
Stolon pubescence	Medium
Attitude of hairs	Upward
Average stolon quantity	Medium
Average stolon diameter at bract (mm)	3.0

TABLE 6

FOLIAGE CHARACTERISTICS	
Characteristic	'DILIGENT'
<u>Foliage:</u>	
Color of upper surface	RHS 146A, medium yellow green
Color of underside	RHS 137C, yellow green group
Number of leaflets	3
Shape in cross section	Slightly concave to flat
Interveinal blistering	Medium
Leaf glossiness	Medium
Leaf variegation	Absent
<u>Terminal Leaflet:</u>	
Length (cm)	6.3
Width (cm)	5.6
Leaf size	Ranges from medium to small
Length/width ratio	1.11, longer than broad
Shape of base	Obtuse
Margins (shape of teeth)	Rounded (crenate)
Serrations per leaf	19.4
<u>Petiole:</u>	
Petiole color	RHS 144A, yellow green group
Petiole length (cm)	8.7
Petiole diameter (mm)	3.2
Petiolule color	RHS 144A, yellow green group
Petiolule length (mm)	7.6
Attitude of hairs	Strongly outward
Petiole pubescence	Heavy
<u>Stipule:</u>	
Color	RHS 146A, yellow green group
Anthocyanin coloration	RHS 161B, red purple group
Anthocyanin intensity	Medium
Length (mm)	13.5
Width (mm)	10.8

TABLE 7

FRUITING TRUSS CHARACTERISTICS	
Characteristic	'DILIGENT'
Anthocyanin coloration	RHS 181D, greyed red group
Anthocyanin intensity	Absent or very weak
Length at maturity (cm)	26.0
Position relative to foliage	Above
Number of flowers	Medium
Pedicel attitude of hairs	Upward

TABLE 7-continued

FRUITING TRUSS CHARACTERISTICS	
Characteristic	'DILIGENT'
Pubescence	Medium
Attitude at first pick	Prostrate

TABLE 8

FLOWER CHARACTERISTICS	
Characteristic	'DILIGENT'
Petal color	RHS NN155C, white group
Sepal color	RHS 137B, green group
Receptacle color	RHS 147B, yellow green group
Anther color	RHS 13A, yellow group
Corolla diameter (mm)	32.5, large
Calyx diameter (mm)	33.9
Petal length (mm)	11.0
Petal width (mm)	12.1
Petal length/width ratio	0.90, broader than long
Petals per flower	5.6
Sepal length (mm)	11.1
Sepal width (mm)	4.6
Sepal length/width ratio	2.43
Sepals per flower	11.3
Size of calyx relative to corolla	Larger
Relative position of petals	Overlapping
Stamen	Present
Size of inner calyx relative to outer calyx	Ranges from smaller to same

TABLE 9

PEST AND DISEASE REACTIONS	
Characteristic	'DILIGENT'
Powdery mildew	Moderately susceptible
<i>Verticillium</i> wilt	Moderately susceptible
Angular leaf spot	Susceptible
<i>Botrytis</i> fruit rot	Moderately susceptible
Two-spotted spider mite	Moderately susceptible

We claim:

1. A new and distinct strawberry plant named 'DILIGENT', as herein described and illustrated by the characteristics set forth above.

* * * * *

FIG. 1



FIG. 2



FIG. 3

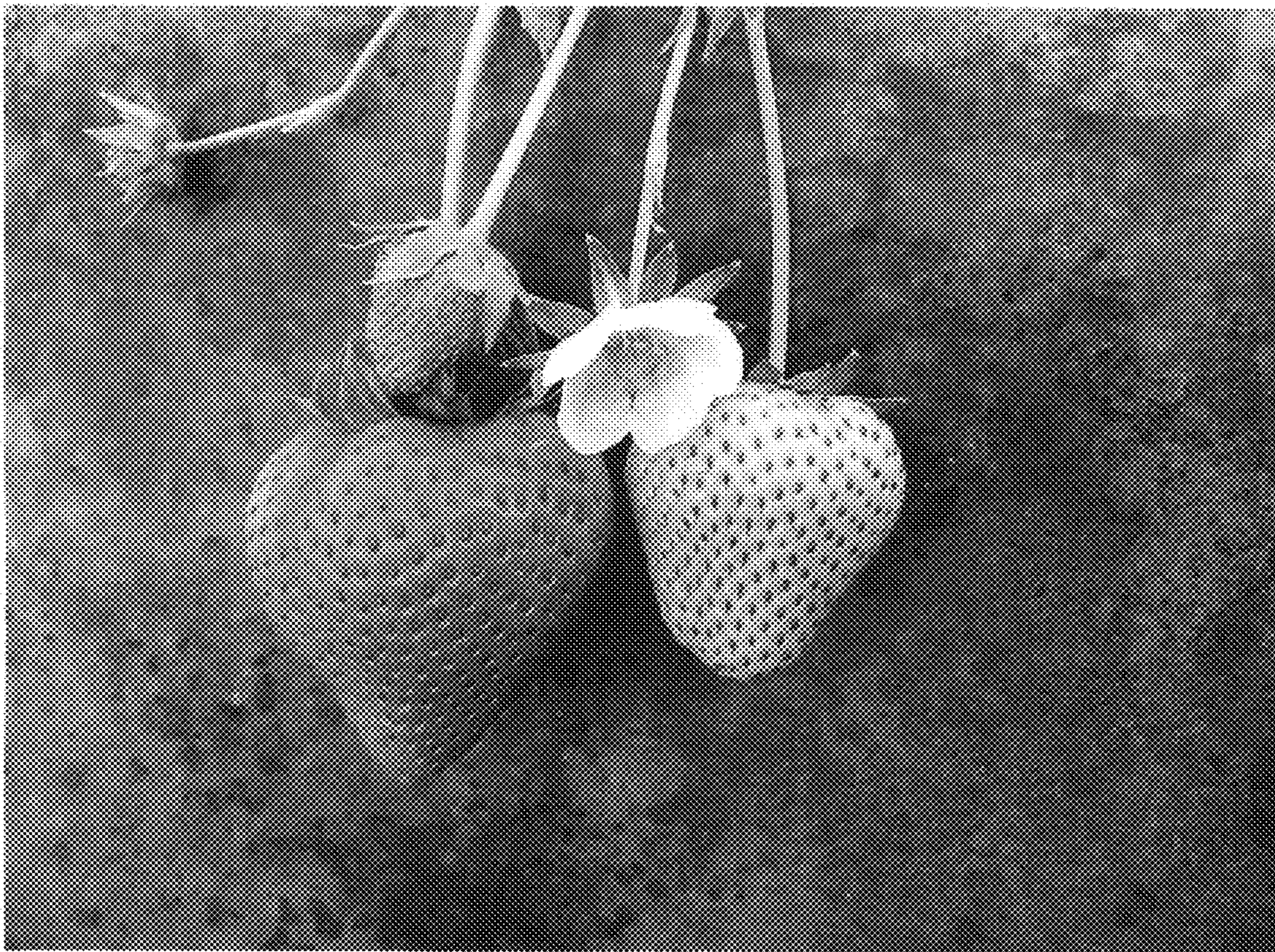


FIG. 4

