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Fear et al.

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[54] RASPBERRY PLANT NAMED 'HOLYOKE'

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[30] **Foreign Application Priority Data**

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[51] **Int. Cl.**[6] **A01H 5/00**

[52] **U.S. Cl.** **Plt./204**

[58] **Field of Search** Plt./204

[56] **References Cited**

U.S. PATENT DOCUMENTS

P.P. 7,528 5/1991 Ackerman Plt./204

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[57] **ABSTRACT**

The present invention relates to a new and distinct cultivar of red raspberry plant named 'Holyoke'. The new cultivar is distinguished from other red fruited raspberry cultivars by its large, glossy fruit of bright color, very attractive fruit and its high yielding capacity on both primocane and floricane crops. 'Holyoke' is distinguished from its pollen parent by having firmer, shinier fruit and being earlier in the primocane crop. The new cultivar is distinguished from its seed parent by having a lighter color and firmer fruit.

2 Drawing Sheets

BACKGROUND OF THE INVENTION

The new cultivar of raspberry plant was developed from the hybridization of the selection 'H374-2' (an unpatented variety) as the seed parent with the selection 'E4-4' (an unpatented variety) as the pollen parent. The parents were crossed in the Fall of 1991, whereafter fruit and seed were collected to produce seedlings for field planting in Watsonville, Calif. in 1991. The new cultivar was selected from these seedlings in June 1993 for its large, bright color, shiny and glossy, very attractive fruit and its high yielding capacity on both primocane and floricane crops. It has excellent fruit firmness and is early in the primocane crop. The new cultivar has been asexually propagated by in vitro shoot tip culture, root sucker division and root cuttings at the Cassin Ranch in Santa Cruz county, Calif. and has been shown to maintain the desired and distinguishing characteristics after propagation over several generations.

SUMMARY OF THE INVENTION

The present invention provides a new and distinct cultivar of red raspberry plant named 'Holyoke'. The 'Holyoke' red raspberry plant produces a primocane crop which begins in mid to late July and continues until early November. The floricane crop begins in mid to late May and continues until early July. Both the primocane and floricane yields are high relative to other comparable varieties. The fruit of 'Holyoke' is large, glossy and attractive and remains consistently so throughout its harvest period. The fruit does not darken in color after harvest.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying photographs show typical specimens of the primocane fruit, leaves and shoot of the new cultivar, in color as nearly true as it is reasonably possible to make in color illustrations of these characteristics.

FIG. **1** is a photograph of a 'Holyoke' primocane mature leaf and fruit.

FIG. **2** is a photograph of a 'Holyoke' primocane shoot.

DETAILED BOTANICAL DESCRIPTION

The following detailed description of the new raspberry cultivar, 'Holyoke', is based upon observations taken of plants and fruit grown in Watsonville, Calif. between 1994 and 1997, and is believed to apply to plants of the 'Holyoke' cultivar grown in similar conditions of soil and climate elsewhere.

Throughout this specification, color names beginning with a small letter signify that the name of the color, as used in common speech, is aptly descriptive. Color data beginning with a capital letter and followed by an alphanumeric code designating the color according to the R.H.S. Colour Chart published by The Royal Horticultural Society of London, England. Color designations, color descriptions, and other phenotypical descriptions may deviate from the stated values and descriptions depending upon variation in environmental, seasonal, climatic and cultural conditions.

Tables 1 and 2 provide information on the plant and fruit characteristics of the new cultivar 'Holyoke' compared with characteristics of the unpatented raspberry cultivars 'Heritage', 'Summit' and 'Amity'. The cultivars closest to the new cultivar 'Holyoke' are 'Heritage' and 'Amity' for their primocane cropping cycle, and 'Heritage' and 'Summit' for their floricane cropping cycle.

The new variety is particularly characterized and distinguished from other cultivars by its large, glossy and firm fruit.

The fruit color of 'Holyoke' is a bright, shiny, glossy red color of very attractive fruit with little color change after harvest.

The primocane yield of 'Holyoke' is high relative to the varieties 'Heritage' and 'Amity'. 'Holyoke' has a floricane yield similar to 'Amity' and 'Heritage'.

'Holyoke' is distinguishable from its pollen parent, selection 'E4-4', by having firmer, shinier fruit and being earlier in the primocane crop. The new cultivar is distinguished from its seed parent, selection 'H374.2', by having lighter color and firmer fruit.

ISOZYME ANALYSIS

In addition to the morphological description above, the new cultivar 'Holyoke' has been analyzed to obtain an indication of its genetic makeup to provide further means for identifying the new variety and distinguishing it from some other somewhat similar and/or related raspberry varieties. Specifically, leaf samples of 'Holyoke', and the unpatented varieties 'Summit' and 'Heritage' were analyzed by electrophoresis for isozyme patterns of the enzymes phosphoglucoisomerase (PGI), malate dehydrogenase (MDH) and phosphoglucomutase (PGM) according to the procedure described by J. C. Cousineau and D. J. Donnelly, "Use of isozyme analysis to characterize raspberry cultivars and detect cultivar mislabeling", *Hort Science* 27:1023–1025 (1992). Isozyme characterization of the cultivar 'Holyoke' is presented in Table 3, with the letters representing the banding patterns for each enzyme as designated in the above-identified article.

DISEASE AND STRESS RESISTANCE

The cultivar has moderate resistance to late leaf rust. Resistance is unknown to powdery mildew and root rots. Cold tolerance of the new cultivar has not been established. Post harvest fruit rot resistance is average in comparison over many selections and varieties.

TABLE 1

PLANT CHARACTERISTICS OF 'HOLYOKE'

	Holyoke	Heritage	Summit	Amity
General				
Plant size	medium	large	small-medium	medium
Growth habit	erect	erect	semi-erect	erect
Productivity	high	medium	high	low-medium
Self-fruitfulness	self-fruitful	self-fruitful	self-fruitful	self-fruitful
Primocane fruiting				
percent of cane flowering as primocane	~15–30	~5–20	~40–50	~20–35
percent of total yield	~60–70	~40–60	~50–70	~40–50
Number of young shoots	medium	medium	few	many
Canes				
Primocanes				
number fruiting laterals/cane	7–21 (mean 14)	2–14 (mean 8)	9–15 (mean 12)	6–14 (mean 10)
number of canes/crown	2–6 (mean 4)	3–5 (mean 4)	2–7 (mean 3)	1–6 (mean 3)
young shoot	weak intensity	medium intensity	medium intensity	medium intensity
pigmentation	red	red	red	red
length (cm)	161–228 (mean 197)	182–230 (mean 208)	137–212 (mean 164)	135–208 (mean 168)

TABLE 1-continued

PLANT CHARACTERISTICS OF 'HOLYOKE'

	Holyoke	Heritage	Summit	Amity
diameter (end of 1st year)				
cane base (cm)	1.1–1.6 (mean 1.3)	0.9–1.4 (mean 1.2)	0.8–1.3 (mean 1.1)	0.8–1.5 (mean 1.1)
central ⅓ of cane (cm)	0.9–1.2 (mean 1.1)	0.8–1.1 (mean 1.0)	0.7–1.0 (mean 0.8)	0.6–1.0 (mean 0.8)
time of shoot emergence	early	very late	late	medium
prickles				
pigmentation	green-brownish green	green-brownish-green	brownish purple-purple	purple
density on young shoots	medium	dense	sparse	sparse
attitude of tip	horizontal	downward	downward	horizontal
size	medium	medium	medium	small
texture	heavy	rigid	heavy	heavy
presence and distribution on petioles	regularly distributed	regularly distributed	regularly distributed	regularly distributed
pubescence on canes	medium	absent or very weak	medium	medium
internodal distance (cm)				
(at central ⅓ of cane)	4.0–7.7 (mean 5.3)	3.0–6.0 (mean 4.7)	3.2–7.5 (mean 4.8)	3.0–6.5 (mean 5.0)
lenticels	not visible	not visible	not visible	not visible
Floricanes				
number nodes/lateral branch	9–16	10–14	10–15	12–19
number of flowers/node	1–2	1–4	2–6	1–2
Leaves				
Arrangement	compound	compound	compound	compound
Relief between veins	strong	very weak	medium	medium
Cross section	variable, convex-concave	concave	flat	concave-flat
Leaflet number	usually 3	3–5	usually 5	usually 3
Terminal leaflet				
length (cm)	13.6	14.6	12.4	13.7
width (cm)	12.2	7.8	7.2	12.1
shape	lobed	ovate	ovate	lobed
tip	acuminate	acuminate	acuminate	acuminate
base	cordate	acute	rounded	cordate
margin	doubly serrate	doubly serrate	doubly serrate	doubly serrate
Lateral leaflets (basal pair)				
overlap	touching	free	overlapping	overlapping

TABLE 1-continued

PLANT CHARACTERISTICS OF 'HOLYOKE'

	Holyoke	Heritage	Summit	Amity
orientation	opposite	opposite	opposite	opposite
shape	ovate	oblique	ovate-lobed	ovate-lobed
tip	acuminate	acuminate	acuminate	acuminate
base	oblique-rounded	oblique	oblique-rounded	oblique
margin	doubly serrate	doubly serrate	doubly serrate	doubly serrate
length (cm)	10.8	14.7	11.6	11.7
width (cm)	8.1	8.6	7.7	8.2
Rachis length between terminal leaflet and adjacent lateral leaflets (cm)	3.0–4.1 (mean 3.4)	0.8–2.2 (mean 1.5)	0.5–1.8 (mean 1.2)	2.4–3.9 (mean 3.0)
Glossiness	glossy	medium	medium	dull
Color				
face	medium 137A	medium 137A, 139A	medium 137A	medium 147A
underside	138B	148C, 191B	191B	191A
Petiole				
length (cm)	5.0–7.8 (mean 6.7)	6.6–8.5 (mean 7.6)	5.8–8.9 (mean 7.4)	4.0–8.2 (mean 6.0)
pigmentation of upper surface	unpigmented	lightly	lightly	lightly
pigmentation of underside	unpigmented	unpigmented	lightly	unpigmented
Petiolule length	very short	very short	short	very short
Stipule orientation	erect	erect	erect-clasping	erect-clasping
Flowers				
Flower color	white	white	white	white
Flowering period				
primocane	mid June-early October	mid June-early October	early June-mid September	early June-early October
floricane	early April-early June	early April-early June	early April-early June	early to mid March-early June
Flower size	medium	small	medium	large
Petal				
length (cm)	0.8–1.0	0.7–0.8	0.7–0.9	0.7–1.0
width (cm)	0.3–0.4	0.3	0.3–0.4	0.3–0.5
Pedicel				
coloration	absent or very weak intensity red	present, strong intensity, red	present, strong intensity, red	present, strong intensity, red
length	medium	medium	medium	long
Productivity				
Primocane	~9.2 t/acre	~5.1 t/acre	~7.3 t/acre	~6.4 t/acre

TABLE 1-continued

PLANT CHARACTERISTICS OF 'HOLYOKE'

	Holyoke	Heritage	Summit	Amity
Floricane	~4.1 t/acre	~4.1 t/acre	~2.9 t/acre	~5.1 t/acre

TABLE 2

FRUIT CHARACTERISTICS OF 'HOLYOKE'

	Holyoke	Heritage	Summit	Amity
Fruit				
Harvest season				
primocane	mid to late July-early November	late July-mid November	mid July-late October	mid July-mid November
floricane	mid to late May-early July	mid May-mid July	mid May-mid July	late April -mid July
Color	Light-Medium Red	Medium Red	Medium Red	Medium Red
immature	44C	53A	46A	46A
maturing	45A	45A, 46D	45A	47A
mature	46A	44C	42B	42B
Glossiness	strong	medium	medium	medium
Dimensions				
weight (g/fruit)				
primocane	4.0–5.1 (mean 4.4)	2.7–2.9 (mean 2.8)	2.5–3.3 (mean 2.8)	2.7–3.7 (mean 3.2)
floricane	3.2–4.2 (mean 3.8)	2.3–2.7 (mean 2.6)	2.5–2.8 (mean 2.6)	3.0–3.4 (mean 3.2)
length (primocane) (mm)	22.2–28.6 (mean 25.3)	—	17.5–25.4 (mean 20.2)	17.5–22.2 (mean 20.1)
width (primocane) (mm)	19.8–27.0 (mean 23.9)	—	18.3–23.0 (mean 20.4)	15.9–23.0 (mean 20.2)
Soluble solids (%)	8.2	—	9.4	9.7
Titratable acidity				
(% as citric acid)	9.0	—	14.5	11.2
Seeds				
weight (mg)	1.9	—	1.8	1.5
Number druplets/fruit	94–131 (mean 111)	45–102 (mean 72)	73–119 (mean 98)	62–108 (mean 88)

TABLE 3

ISOZYME BANDING PATTERNS OF 'HOLYOKE' COMPARED WITH 'HERITAGE' AND 'SUMMIT'

	Isozyme and Pattern		
Cultivar	PGI	MDH	PGM
Holyoke	D	K	C
Heritage	A	D	C
Summit	A	C	A

We claim:

1. A new and distinctive cultivar of raspberry plant, as illustrated and described herein.

* * * * *

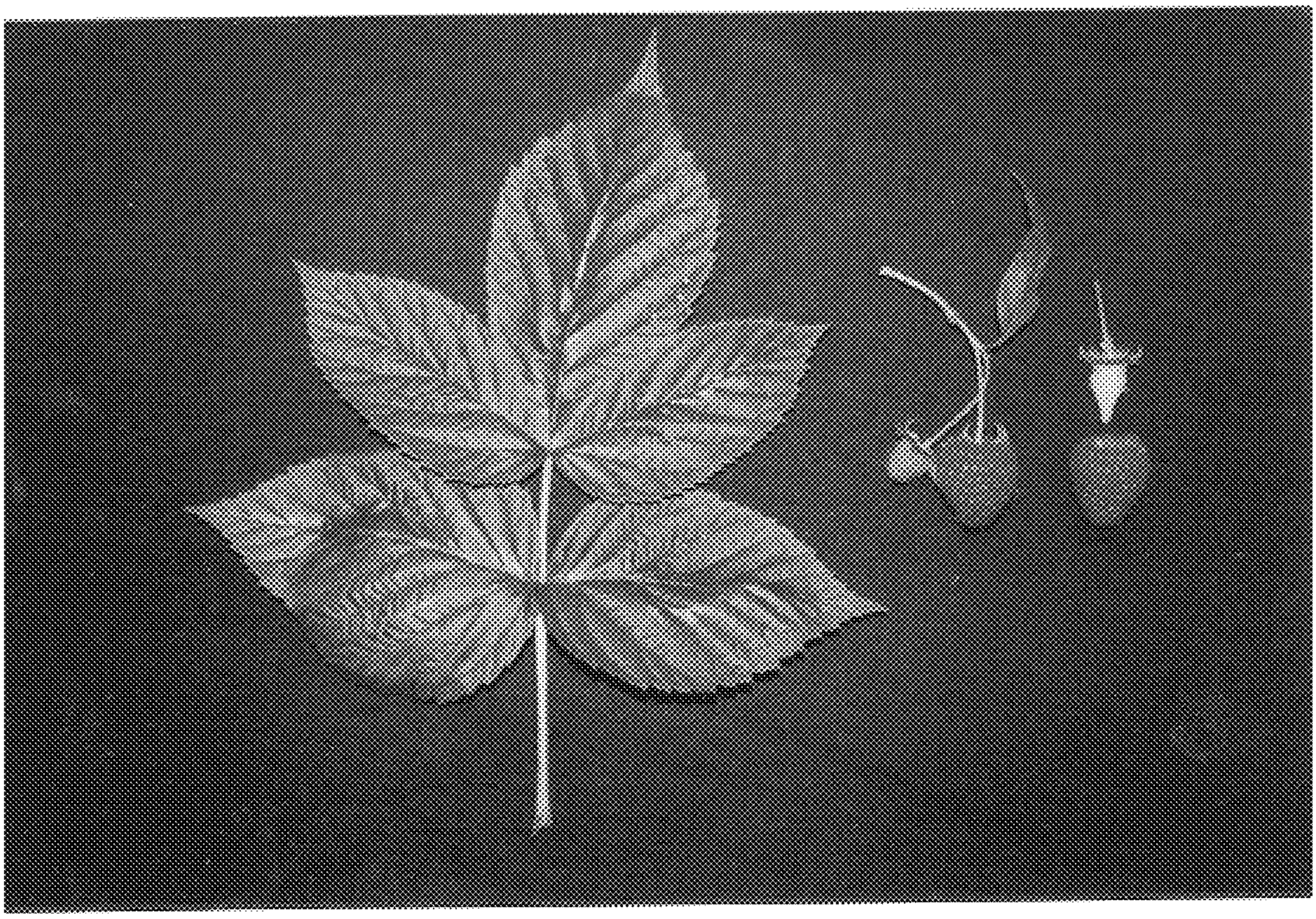

FIG. 1

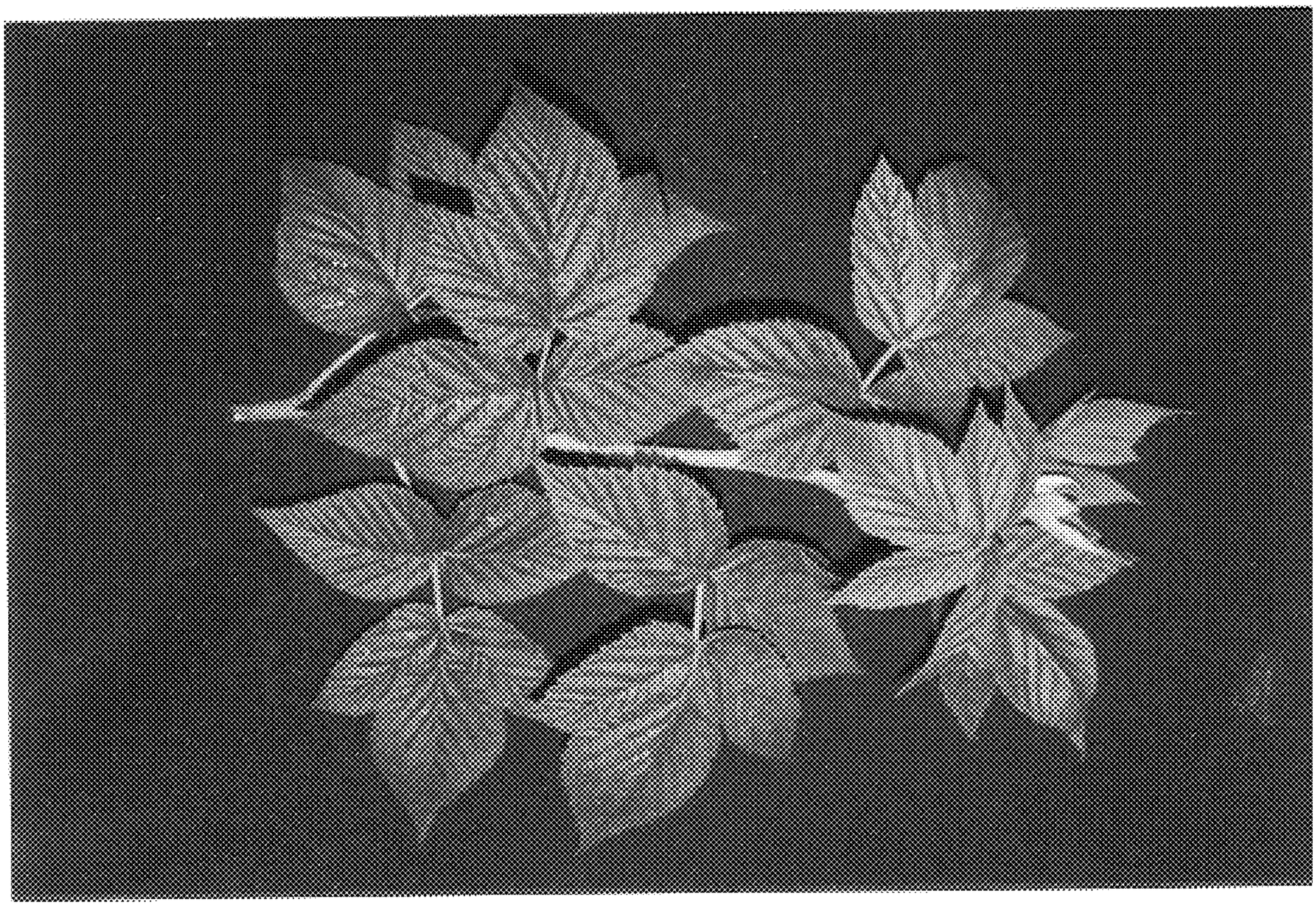

FIG. 2