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(12) **United States Plant Patent**
Finn

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(54) **BLACKBERRY PLANT NAMED ‘COLUMBIA STAR’**

(50) Latin Name: *Rubus* subg. *Rubus* Watson
Varietal Denomination: **Columbia Star**

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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 100 days.

(21) Appl. No.: **13/815,074**

(22) Filed: **Jan. 29, 2013**

(51) **Int. Cl.**
A01H 5/00 (2006.01)

(52) **U.S. Cl.**
USPC **Plt./203**

(58) **Field of Classification Search**
USPC Plt./203
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

PP17,983 P2 9/2007 Cabrera Avalos
PP22,002 P2 7/2011 Sills et al.

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(57) **ABSTRACT**

A new and distinct blackberry cultivar that originated from seed produced from a cross between the female blackberry plant ‘NZ 9629-1’ (unpatented) and the male parent blackberry plant ‘ORUS 1350-2’ (unpatented). This new blackberry cultivar can be distinguished by its high yields of large, very uniformly shaped berries with very good flavor, sweetness, and fruit chemistry as characterized by soluble solids, pH, and titratable acidity that make them well suited for processing. The new and distinct blackberry variety has fruit that are borne on vigorous, completely thornless plants and can be harvested by machine.

5 Drawing Sheets

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Latin name of the genus and species of the plant claimed: ‘COLUMBIA STAR’ is a blackberry plant that is *Rubus* subg. *Rubus* Watson.

Variety denomination:

The new blackberry plant claimed is of the variety denominated ‘Columbia Star’ *Rubus* subg. *Rubus* Watson.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct blackberry cultivar designated ‘Columbia Star’ and botanically known as *Rubus* subg. *Rubus* Watson. This new blackberry cultivar was discovered in Corvallis, Oreg. in July 2008 and originated from a cross between the female blackberry plant ‘NZ 9629-1’ (unpatented) and the male parent blackberry plant ‘ORUS 1350-2’ (unpatented). ‘Columbia Star’s spinelessness is derived from ‘Lincoln Logan’ (unpatented) that can be found as a parent four and five generations back in ‘Columbia Star’s pedigree. The original seedling of the new cultivar was asexually propagated at a nursery in Benton County, Oreg. The new cultivar was established in vitro from a cane cutting and microcuttings have been taken and rooted from this sort of culture. The present invention has been found to be stable and reproduce true to type through successive asexual propagations.

BRIEF DESCRIPTION OF THE PHOTOGRAPHS

This new blackberry plant is illustrated by the accompanying photographs that show the fruit of the plant and machine harvested fruit, as well as canes and entire plants; the colors

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shown are as true as can be reasonably obtained by conventional photographic procedures.

FIG. 1. shows a section of a spineless primocane and a leaf.

FIG. 2. shows a fruiting lateral with typical leaves.

FIG. 3. shows typical fruit in a fruit cluster in the field.

FIG. 4. shows machine harvested fruit.

FIG. 5. shows an entire 5-year old plant.

DETAILED DESCRIPTION OF THE NEW CULTIVAR

The following description of ‘Columbia Star’ is based on observations taken from 2009 to 2012 growing seasons in trials in Corvallis and Aurora, Oreg. This description is in accordance with UPOV terminology. 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. ‘Columbia Star’ has not been observed under all possible environmental conditions. Color terminology follows The Royal Horticultural Society Colour Chart. London (R.H.S.) (5th edition, 2007).

Table 1 shows plant characteristics of the new cultivar compared with plant characteristics of the blackberry plants ‘Marion’, (unpatented) and ‘Black Diamond’, (unpatented). Characteristics include plant vigor, presence of spines further than 0.6 m from the soil surface, presence of spines less than 0.6 m from the soil surface, weight of primary fruit, uniformity of berry shape, fruit firmness, fruit flavor, fruit soluble solids (%; in Brix), fruit pH, fruit titratable acidity (% as citric acid), and yield (actual kg•plt-1).

TABLE 1

Characteristic	Columbia Star	Marion	Black Diamond
Plant vigor	High	High	Medium
Presence of spines further than 0.6 m from the soil surface	Absent	Numerous	Absent
Presence of spines less than 0.6 m from the soil surface	Absent	Numerous	Numerous
Weight of primary fruit	7.96 g	3.76 g	6.92 g
Uniformity of berry shape	Excellent	Fair	Excellent
Fruit firmness	Very good	Poor	Good
Fruit flavor	Excellent	Excellent	Good
Fruit soluble solids (%; in Brix)	12.80	12.28	10.47
Fruit pH	3.20	3.27	3.40
Fruit titratable acidity (% as citric acid)	15.76	14.75	12.02
Yield (actual kg · plt-1)	6.98	5.83	4.75

Table 2 shows plant characteristics of the new cultivar compared with plant characteristics of the blackberry plants 'Marion', (unpatented) and 'Black Diamond', (unpatented). Characteristics include plant vigor, growth habit, date of bud-break, timing of primocane emergence, primocane length on 14 Jun. 2012, and winter tolerance in Lynden, Wash. (48° 56' 48" N/122° 27' 2" W).

TABLE 2

Characteristic	Columbia Star	Marion	Black Diamond
Plant vigor	High	High	Medium
Growth habit	Trailing	Trailing	Trailing
Date of budbreak	27 Mar. 2012	27 Mar. 2012	27 Mar. 2012
Timing of primocane emergence	Early to medium	Medium	Medium to late
Winter tolerance in Lynden, Washington (48° 56' 48" N/122° 27' 2" W)	Good-very good	Fair-good	very good

Table 3 shows floricate and mature primocane characteristics of the new cultivar compared with floricate and mature primocane characteristics of the blackberry plants 'Marion', (unpatented) and 'Black Diamond', (unpatented). Characteristics include diameter at base, diameter at midpoint, diameter at terminus, internode length at base, internode length at midpoint, internode length at terminus, presence of spines further than 0.6 m from the soil surface, presence of spines less than 0.6 m from the soil surface, floricate color at base, floricate color at midpoint, floricate color at terminus, floricate lateral length, floricate lateral strength, primocane color at base, primocane color at midpoint, primocane color at terminus, and floricate length (range).

TABLE 3

Characteristic	Columbia Star	Marion	Black Diamond
Diameter at base	0.84 cm	1.13 cm	1.44 cm
Diameter at midpoint	0.56 cm	0.85 cm	0.80 cm
Diameter at terminus	0.31 cm	0.27 cm	0.55 cm
Internode length at base	6.03 cm	6.37 cm	5.04 cm
Internode length at midpoint	5.22 cm	5.63 cm	5.77 cm
Internode length at terminus	3.81 cm	5.99 cm	4.90 cm
Presence of spines further than 0.6 m from the soil surface	Absent	Numerous	Absent

TABLE 3-continued

Characteristic	Columbia Star	Marion	Black Diamond
5 Presence of spines less than 0.6 m from the soil surface	Absent	Numerous	Numerous
Floricate color at base	144A	146B	152A
Floricate color at midpoint	146C	146B	152A
10 Floricate color at terminus	144B	152C	152B
Floricate lateral length	Medium-long	Long	Short
Floricate lateral strength	Medium	Weak to medium	Strong
15 Primocane color at base	144A	138B-146D w/red (166A) streaking	144A w/red (187A) streaking
Primocane color at midpoint	144A	143C-145A w/ red (166A) streaking	146C w/red (187A) streaking
Primocane color at terminus	144B	146D	144A, often streaked w/red (187A)
20 Floricate length (range)	2.8-3.7 m	4.9-5.8 m	2.7-4.3 m

Table 4 shows primocane foliage characteristics of the new cultivar compared with primocane foliage characteristics of the blackberry plants 'Marion', (unpatented) and 'Black Diamond', (unpatented). Primocane characteristics include mature compound leaf width, mature compound leaf length, number of leaflets per primocane compound leaf, mature leaflet shape, mature leaflet apex, mature leaflet base, mature terminal leaflet width, mature terminal leaflet length, mature first lateral leaflet width, mature first lateral leaflet length, leaflet margin, leaflet serration teeth length, leaflet serration teeth width at base, spine presence on leaves, pubescence on primocane leaflet: upper surface, pubescence on primocane leaflet: undersurface, primocane leaf color abaxial, primocane leaf color adaxial, petiole length, petiole color: upper surface, petiole color: undersurface, petiolule length: terminal leaflet, petiolule length: first distal leaflet, petiolule color: abaxial, petiolule color: adaxial, stipule length, and stipule width.

TABLE 4

Characteristic	Columbia Star	Marion	Black Diamond
45 Mature compound leaf width	22.07 cm	17.21 cm	19.75 cm
Mature compound leaf length	22.42 cm	15.52 cm	18.83 cm
Number of leaflets per primocane compound leaf	Usually 5	Usually 3; sometimes 5	Usually 5; ranges from 3-7
50 Mature leaflet shape	Ovate	Ovate	Ovate to Cordate
Mature leaflet apex	Acute	Broadly acuminate/acute	Broadly acuminate
Mature leaflet base	Cordate	Rounded	Round to cordate
55 Mature terminal leaflet width	8.70 cm	8.22 cm	7.43 cm
Mature terminal leaflet length	11.68 cm	10.07 cm	8.83 cm
Mature first lateral leaflet width	4.92 cm	5.97 cm	7.72 cm
Mature first lateral leaflet length	7.30 cm	8.37 cm	10.07 cm
60 Leaflet margin	Double serrate	Serrate	Serrate
Leaflet serration teeth length	0.42 cm	0.18 cm	0.24 cm
65 Leaflet serration teeth width at base	1.07 cm	0.34 cm	0.40 cm

TABLE 4-continued

Characteristic	Columbia Star	Marion	Black Diamond
Spine presence on leaves	Absent	Long prickles on sides and back of petiole, petioles, midveins; smaller prickles on lateral veins	Very short, soft spines on sides and back of petiole, petioles, midveins and larger lateral veins
Pubescence on primocane leaflet: upper surface	Light	Medium to coarse	Sparse
Pubescence on primocane leaflet: undersurface	Light	Heavy, soft	Heavy, soft
Primocane leaf color abaxial	N137A	N137	N137
Primocane leaf color adaxial	137B	147B	147B
Petiole length	8.18 cm	5.42 cm	7.90 cm
Petiole color: upper surface	144A	146B-C	146A & 146B, maturing to 177A
Petiole color: undersurface	144B streaked with red 184A	144B	144B
Petiolule length: terminal leaflet	2.83 cm	2.12 cm	4.43 cm
Petiolule length: first distal leaflet	0.28 cm	0.28 cm	0.68 cm
Petiolule color: abaxial	200B	146B-146C	146A & 146B
Petiolule color: adaxial	144B	144B	144B
Stipule length	2.20 cm	1.39 cm	0.90 cm
Stipule width	0.20 cm	0.31 cm	0.23 cm

Table 5 shows florican foliage characteristics of the new cultivar compared with florican foliage characteristics of the blackberry plants 'Marion', (unpatented) and 'Black Diamond', (unpatented). Florican characteristics include mature compound leaf width, mature compound leaf length, number of leaflets per florican compound leaf, mature leaflet shape, mature leaflet apex, mature leaflet base, mature terminal leaflet width, mature terminal leaflet length, mature first lateral leaflet width, mature first lateral leaflet length, leaflet margin, leaflet serration teeth length, leaflet serration teeth width at base, pubescence on florican leaflet: upper surface, pubescence on florican leaflet: undersurface, florican leaf color abaxial, florican leaf color adaxial, petiole length, petiolule length: terminal leaflet, petiolule length: first distal leaflet, petiolule color: abaxial, petiolule color: adaxial, stipule length, and stipule width.

TABLE 5

Characteristic	Columbia Star	Marion	Black Diamond
Mature compound leaf width	16.70 cm	13.52 cm	11.57 cm
Mature compound leaf length	16.07 cm	12.32 cm	11.68 cm
Number of leaflets per florican compound leaf	Usually 3	Usually 3; occasionally 1	Usually 3; occasionally 1 or 5
Mature leaflet shape	Ovate	Oval to ovate	Oval to ovate
Mature leaflet apex	Acute	Acute to broadly acuminate	Acute
Mature leaflet base	Rounded	acute to rounded	rounded to cordate
Mature terminal leaflet width	7.27 cm	6.55 cm	6.18 cm

TABLE 5-continued

Characteristic	Columbia Star	Marion	Black Diamond
5 Mature terminal leaflet length	11.47 cm	8.00 cm	8.28 cm
Mature first lateral leaflet width	6.18 cm	5.30 cm	4.77 cm
Mature first lateral leaflet length	9.07 cm	7.67 cm	6.57 cm
10 Leaflet margin	Double serrate	Serrate	Serrate
Leaflet serration teeth length	0.29 cm	0.29 cm	0.27 cm
Leaflet serration teeth width at base	0.48 cm	0.81 cm	0.64 cm
Pubescence on florican leaflet: upper surface	Light	Light	None
Pubescence on florican leaflet: undersurface	Light	Heavy	Medium
Florican leaf color abaxial	N137A	146A	147A
Florican leaf color adaxial	137C	148B	147B
Petiole length	7.07 cm	4.67 cm	4.43 cm
Petiolule length: terminal leaflet	2.28 cm	1.32 cm	1.90 cm
Petiolule length: first distal leaflet	0.30 cm	0.33 cm	0.23 cm
25 Petiolule color: abaxial	145A	146C	146C
Petiolule color: adaxial	185A & 145A	144C	144B
Stipule length	1.36 cm	0.964 cm	0.25 cm
30 Stipule width	0.12 cm	0.19 cm	0.04 cm

Table 6 shows flower and flowering characteristics of the new cultivar compared with flower and flowering characteristics of the blackberry plants 'Marion', (unpatented) and 'Black Diamond', (unpatented). Flower and flowering characteristics include date 1st bloom, date full bloom, date last bloom, petal color, number of flowers per cluster, number of petals per flower, flower diameter, petal length, petal width, and number of sepals per flower.

TABLE 6

Characteristic	Columbia Star	Marion	Black Diamond
45 Date 1 st bloom	7-May	21-May	14-May
Date full bloom	15-May	28-May	21-May
Date last bloom	17 June	17 June	14 June
Petal color	155C	NN155D	NN155C
Number flowers per cluster	3.50	8.00	9.17
Number of petals per flower	5.17	5.17	5.33
50 Flower diameter	3.23 cm	6.14 cm	2.51 cm
Petal length	1.65 cm	1.93 cm	1.32 cm
Petal width	0.96 cm	1.21 cm	1.00 cm
Number of sepals per flower	5.83	5.50	5.83

Table 7 shows fruit and fruiting characteristics of the new cultivar compared with fruit and fruiting characteristics of the blackberry plants 'Marion', (unpatented) and 'Black Diamond', (unpatented). Fruit and fruiting characteristics include date 5% of fruit were ripe, date 50% of fruit were ripe, date 95% of fruit were ripe, weight of primary fruit, weight of secondary fruit, weight of tertiary fruit, diameter of primary fruit at equator, diameter of 2° fruit at equator, diameter of 3° fruit at equator, diameter of 1° fruit at poles: tip, diameter of 1° fruit at poles: base, diameter of 2° fruit at poles: tip, diameter of 2° fruit at poles: base, diameter of 3° fruit at poles:

tip, diameter of 3° fruit at poles: base, berry length primary fruit, berry length 2° fruit, berry length 3° fruit, ratio of primary fruit length to width, shape description, uniformity of berry shape, color when full ripe, number of drupelets per fruit, drupelet weight, individual seed weight, glossiness, firmness, flavor, texture of fruit when chewed, drupelet skin resistance to abrasion, ease of separation of fruit from pedicel, machine harvestability, resistance to heat damage of fruit, berries per inflorescence—mean, berries per inflorescence range, soluble solids (%; in Brix), pH, titratable acidity (% as citric acid), and yield (actual kg·plt-1). Fruit is borne only on floricanes.

TABLE 7

Characteristic	Columbia Star	Marion	Black Diamond
Date 5% of fruit were ripe	7 July	14 July	7 July
Date 50% of fruit were ripe	18 July	21 July	25 July
Date 95% of fruit were ripe	1 August	1 August	4 August
Weight of primary fruit	7.96 g	3.76 g	6.92 g
Weight of secondary fruit	9.68 g	4.21 g	6.49 g
Weight of tertiary fruit	8.02 g	6.79 g	6.44 g
Diameter of primary fruit at equator	1.94 cm	1.71 cm	1.98 cm
Diameter of 2° fruit at equator	1.98 cm	1.80 cm	1.96 cm
Diameter of 3° fruit at equator	1.88 cm	1.91 cm	1.90 cm
Diameter of 1° fruit at poles: tip	1.28 cm	1.05 cm	1.24 cm
Diameter of 1° fruit at poles: base	1.68 cm	1.63 cm	1.82 cm
Diameter of 2° fruit at poles: tip	1.25 cm	1.04 cm	1.12 cm
Diameter of 2° fruit at poles: base	1.82 cm	1.60 cm	1.70 cm
Diameter of 3° fruit at poles: tip	3.85 cm	1.14 cm	1.25 cm
Diameter of 3° fruit at poles: base	1.73 cm	1.79 cm	1.76 cm
Berry length primary fruit	3.83 cm	2.65 cm	3.19 cm
Berry length 2° fruit	3.84 cm	2.56 cm	2.91 cm
Berry length 3° fruit	3.62 cm	3.39 cm	2.88 cm
Ratio of primary fruit length to width	1.98	1.55	1.62
Shape description	Conic	Rough conic	Conic
Uniformity of berry shape	Excellent	Fair	Excellent
Color when full ripe	203B	203C	203B
Number of drupelets per fruit	147.67	59.00	75.83
Drupelet weight	5.10 mg	9.30 mg	7.90 mg
Individual seed weight	3.95 mg	3.95 mg	3.95 mg
Glossiness	Medium glossy to dull	Medium glossy to dull	Medium glossy to dull
Firmness	Very good	Poor	Good
Flavor	Excellent	Excellent	Good
Texture of fruit when chewed	Very good to excellent	Excellent	Very good

TABLE 7-continued

Characteristic	Columbia Star	Marion	Black Diamond
5 Drupelet skin resistance to abrasion	Good	Poor	Good
Ease of separation of fruit from pedicel	Easy	Easy	Easy
Machine harvestability	Excellent	Excellent	Excellent
Resistance to heat damage of fruit	Medium to good	Low	Medium to good
10 Berries per inflorescence - mean	7.00	7.20	11.50
Berries per inflorescence range	5-10	7-8	9-14
Soluble solids (%; in Brix)	12.80	12.28	10.47
pH	3.20	3.27	3.40
15 Titratable acidity (% as citric acid)	15.76	14.75	12.02
Yield (actual kg · plt-1)	6.98	5.83	4.75

COMPARISON WITH PARENTAL AND COMMERCIAL VARIETIES

‘Columbia Star’ differs from the female parent ‘NZ 9629-1’ (unpatented) in that ‘Columbia Star’ has medium-sized, glossy, large fruit (7-8 g), while ‘NZ 9629-1’ has slightly pubescent fruit that are smaller (4.5 g). Furthermore, while ‘Columbia Star’ has yields greater than ‘Marion’ (unpatented) ‘NZ 9629-1’ (unpatented) has yields comparable to ‘Marion’

‘Columbia Star’ differs from the male parent blackberry plant ‘ORUS 1350-2’ (unpatented) in that it is ‘Columbia Star’ is spineless, has large (7-8 g), conic berries with excellent flavor, while ‘ORUS 1350-1’ (unpatented) is spiny, and has very large (10-12 g), barrel shaped berries with poor flavor.

‘Columbia’ Star differs from the commercial variety ‘Marion’ (unpatented) in that ‘Columbia Star’ is spineless and bears high yields of large, firm fruit, while ‘Marion’ is spiny, bears medium yields of medium sized, soft fruit. ‘Columbia Star’ differs from the commercial variety ‘Black Diamond’ (unpatented) in that ‘Columbia Star’ carries the ‘Lincoln Logan’ (unpatented) source of spinelessness and therefore the canes are completely spineless and the plants are vigorous with fruit that have excellent, aromatic flavor, while ‘Black Diamond’ (unpatented) carries the ‘Austin Thornless’ (unpatented) source of spinelessness and so has spines on the base of the canes and the plants are not vigorous and they produce fruit with a mild flavor.

I claim:

1. A new and distinct cultivar of blackberry plant, substantially as illustrated and described, characterized by its high yields of large, very uniformly shaped berries with very good flavor, sweetness, as characterized by soluble solids, pH, and titratable acidity that make them well suited for processing and that are borne on vigorous, completely thornless plants that can be harvested by machine.

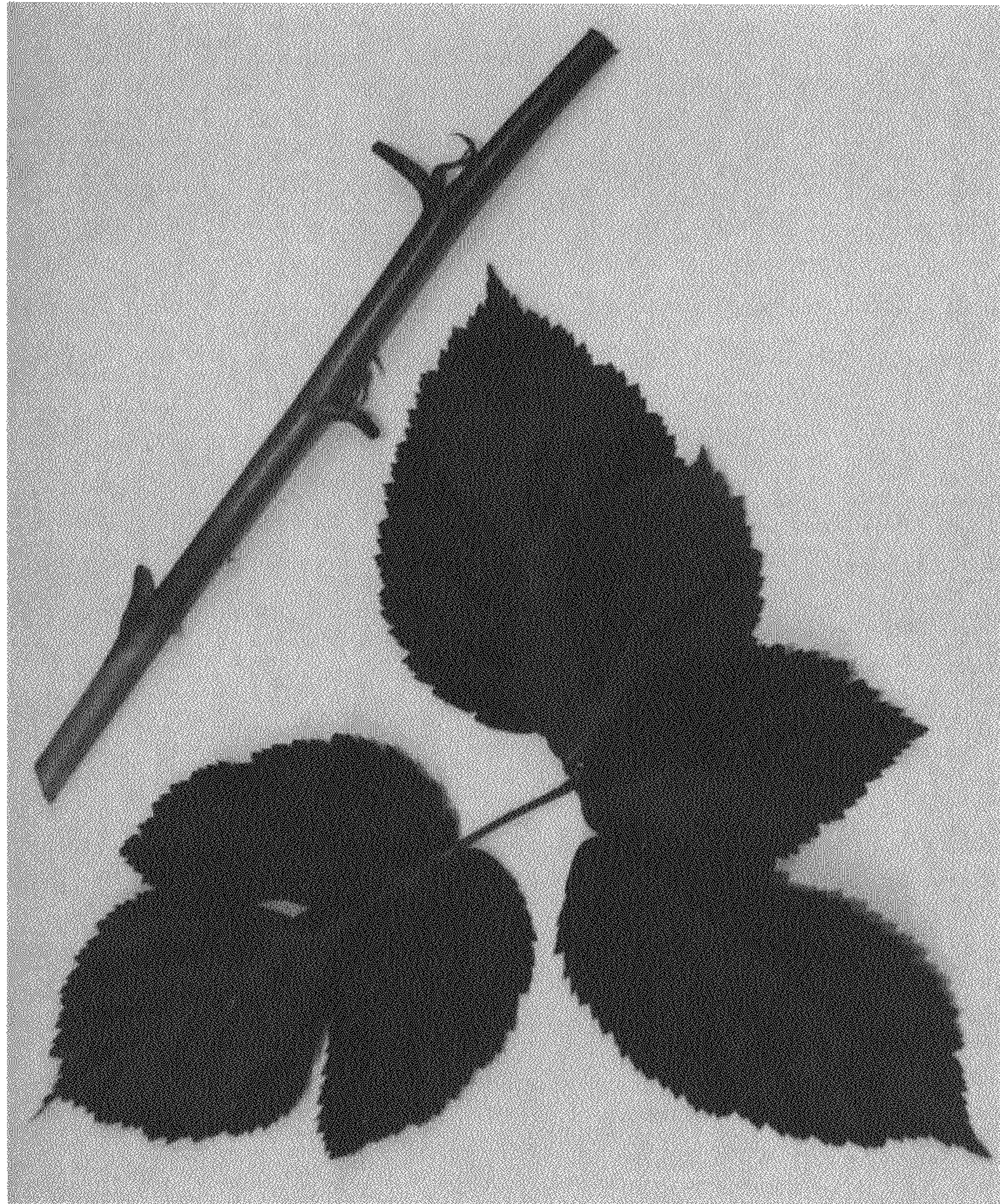


FIG. 1

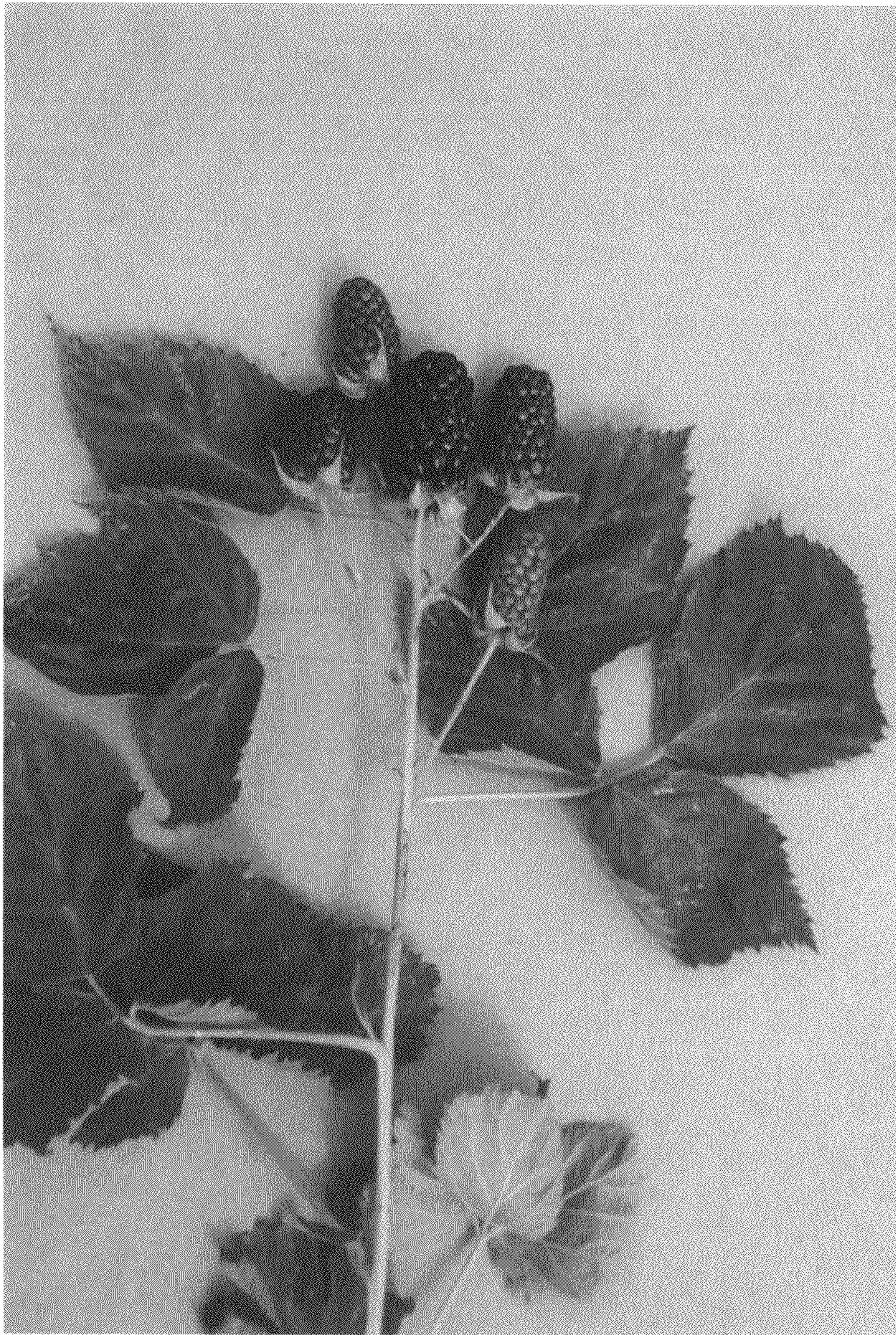


FIG. 2



FIG. 3

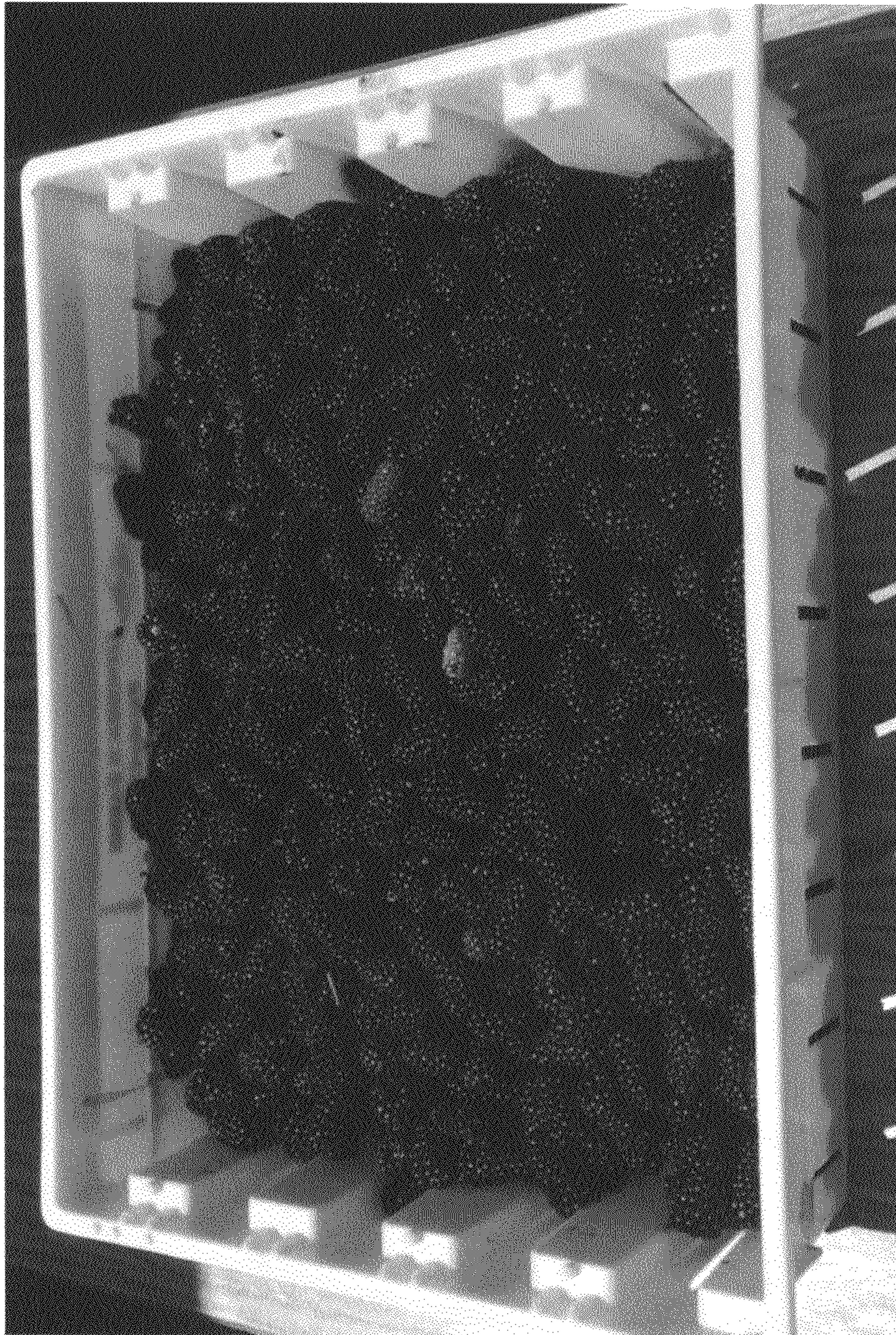


FIG. 4



FIG. 5