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[54] STRAWBERRY PLANT NAMED 'ALISAL'

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[52] U.S. Cl. Plt./209

[58] Field of Search Plt./209

[56] References Cited

U.S. PATENT DOCUMENTS

P.P. 7,024 9/1989 Johsno, Jr. et al. Plt./209

P.P. 8,086 1/1993 Nelson et al. Plt./209
P.P. 8,649 3/1994 Sjulín et al. Plt./208
P.P. 10,534 8/1998 Sjulín et al. Plt./209
P.P. 11,279 3/2000 Gilford et al. Plt./209

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[57] ABSTRACT

This invention relates to a new and distinct variety of strawberry named 'Alisal'. The variety is similar to the variety 'Commander'. The variety is characterized from 'Commander', in particular, by its plant height, spread and number of crowns; bract frequency and fruit skin and flesh color.

3 Drawing Sheets

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1. BACKGROUND OF THE INVENTION

The new variety originated as a result of a controlled cross between the strawberry plant 'R2' (an unpatented variety of Driscoll Strawberry Associates, Inc.) and 'Key Largo' (U.S. Plant Pat. No. 8,649) in an ongoing breeding program, and was discovered as a seedling in a controlled breeding plot. The original seedling of the new cultivar was asexually propagated by stolons at the Driscoll Strawberry Associates, Inc. nursery in Shasta County, Calif. Propagules were transplanted to a controlled breeding plot on the Fly Ranch in Monterey County, Calif. in November of 1993 where the new cultivar first fruited in April of 1994 and was selected for further evaluation. 'Alisal' was subsequently asexually propagated and underwent further testing in the area of Watsonville, Calif. from 1995 through 1998. This propagation and testing has demonstrated that the combination of traits disclosed herein which characterize the new variety are fixed and retained true to type through successive generations of asexual reproduction.

2. SUMMARY OF THE INVENTION

The present invention relates to a new and distinct variety of strawberry named 'Alisal'. The variety is botanically identified as *Fragaria x ananassa*. The new variety is distinguished from other varieties by a number of characteristics as set forth in Tables 1, 2 and 3.

3. COMPARISON TO CLOSEST VARIETIES

The variety which we believe to be closest to 'Alisal' from those known to us is 'Commander' (U.S. Plant Pat. No. 7,024). There are several characteristics of the new variety that are different from, or not possessed by 'Commander'. Table 1 provides information on the plant and fruit characteristics of the new variety 'Alisal' compared with characteristics of 'Commander'. Table 2 provides additional information of the plant and fruit characteristics of the new variety 'Alisal' compared with characteristics of the varieties 'Commander', 'Lido' (U.S. Plant Pat. No. 10,534), and

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'Key Largo' (U.S. Plant Pat. No. 8,469). Table 3 provides isozyme characteristics of the new variety as compared to the varieties 'Commander', 'Lido' and 'Key Largo'. Data was taken from each variety as grown in a side-by-side field trial with 'Alisal'.

4. BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying photographs show typical specimens of the new variety, including fruit, foliage and flowers, in color as nearly true as it is reasonably possible to make in color illustrations of these characteristics.

FIG. 1 shows the general characteristics of the whole plant.

FIG. 2 shows the upper surface of two typical mature leaves of the new variety.

FIG. 3 shows the flower and reproductive organs of the new variety, as well as the size and position of the petals and sepals and the underside of the calyx.

FIG. 4 shows five typical whole fruit.

FIG. 5 shows five typical sliced fruit, illustrating the typical flesh and flesh coloration.

5. DESCRIPTION OF THE NEW VARIETY

The following detailed description of the new variety is based upon observations taken of plants and fruit grown in Watsonville, Calif., U.S.A. Observations of 'Alisal' and 'Commander' were taken in side by side comparison in 1998. 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. Colors are described using standard Munsell Notation.

5.1 Propagation

The new variety is principally propagated by way of stolons. Although propagation by stolons is presently

preferred, other known methods of propagating strawberry plants may be employed.

5.2 Characteristics of the New Variety

Information on the new variety is presented in Tables 1, 2 and 3. In the tables, the flowers described are secondary flowers except where indicated. Petal color of 'Alisal' is white (N 9.5). The fruit described is the secondary fruit on one year old plants. Fruit and flower measurements are an average of both primary and secondary fruit and flowers.

Plants and Foliage

Plants of 'Alisal' are slightly more vigorous and upright in form than those of 'Commander' in side by side trials. The foliage canopy of 'Alisal' is denser than that of 'Commander', 'Key Largo' or 'Lido' (see Table 2). The upper leaf surface of 'Alisal' is lighter green than that of 'Commander' and 'Lido' and slightly darker than that of 'Key Largo'. The shape of leaves of 'Alisal' in cross section is flatter than those of 'Commander' and 'Lido' and slightly less flat than those of 'Key Largo'. 'Alisal' has pronounced interveinal leaf blistering giving the leaves a crinkled appearance. The interveinal blistering of 'Alisal' is stronger than that of 'Commander' and much stronger than 'Lido' or 'Key Largo'. The frequency of bracts on petioles of 'Alisal' is much higher than that of 'Commander', 'Lido' or 'Key Largo'. Bracts on 'Alisal' are typically present in pairs while those on the reference cultivars are typically single. Terminal leaflets of 'Alisal' possess a higher number of teeth than those of 'Commander' and 'Key Largo' and a slightly higher number than those of 'Lido'. The leaves of 'Alisal' produce anthocyanin earlier in the fall of the year than those of 'Commander' or 'Lido'. Appearance of the anthocyanin pigment is similar in timing to that of 'Key Largo'. In 1998, leaf anthocyanin first appeared on plants of 'Key Largo' and 'Alisal' in early-October, while on plants of 'Commander' it appeared in late-October–early November.

Flower and Fruit Characteristics

The flowers of 'Alisal' are similar or slightly smaller in size than those of 'Commander', while the calyx is on average larger than that of 'Commander'. The date of first bloom for 'Alisal' ranges from early February to early April, depending on climatic conditions. The individual bloom lasts from 2 to 5 days, also depending on climatic conditions. The petals of 'Alisal' flowers are broader than long (broadly spatulate), while those of 'Commander' are as broad as they are long. 'Alisal' typically displays 6 petals per flower, though petals may occasionally number 5 or 7. The flower shape of 'Alisal' is typical of the species. 'Alisal' typically displays 10 (occasionally 12 or 14) broadly lanceolate speals. There is an average of 5.5 (range of 4 to 7) flowers per inflorescence. No fragrance is detectable. The fruit skin color of 'Alisal' is darker than that of 'Commander' and 'Lido' but similar in color to that of 'Key Largo'. The fruit flesh color of 'Alisal' is white to pale rose and is similar to that of 'Commander' and 'Lido' but lighter red than that of 'Key Largo'. The average fruit size for 'Alisal' is larger than that of 'Key Largo' but slightly smaller than that of 'Commander' and 'Lido'. The primary fruit is larger than the secondary fruit. The shape of the primary fruit is wedge to wedge-conic. The achenes of 'Alisal' are red (9.7R 2.2/5.9) to yellow (9.1YR 7.3/15.7) in color and indented. In a blind taste test, fruit of 'Alisal' has rated higher than that of 'Commander' and less than that of 'Lido'. Flavor was

preferred over that of 'Commander'. The shipping ability of 'Alisal' fruit as measured by percent damaged fruit after transcontinental shipping is similar to that of 'Commander'.

The production cycle of 'Alisal' is similar to that of 'Commander' but with greater late season yield (Table 1). Production of 'Alisal' commences in early to mid-April and continues through early-November in the Watsonville, Calif. area. The chilling requirement of 'Alisal' is approximately 2 weeks of cold storage prior to planting for optional fruit yields which is intermediate to that of 'Commander' and 'Lido'. The total yield for 'Alisal' and 'Commander' are comparable when grown under similar cultural regimes.

TABLE 1

DETAILED COMPARISON OF 'ALISAL' AND 'COMMANDER'		
	Alisal	Commander
<u>Plant Characteristics</u>		
Height of Plant	22.25 cm	20.85 cm
Spread of Plant	43.95 cm	42.80 cm
Number of Crowns	6.3	4.1
<u>Leaf Characteristics</u>		
Terminal Leaflet Width	8.26 cm	7.82 cm
Terminal Leaflet Length	8.38 cm	8.06 cm
Terminal Leaflet Length/Width Ratio	1.01	1.03
Number of Teeth/Terminal Leaflet	25.44	18.50
Petiole Length	22.41 cm	20.34 cm
Bract Frequency	80%	20%
Stipule Length	3.75 cm	3.30 cm
Stipule Width	0.83 cm	1.02 cm
Stipule Color	6.1GY 3.2/5.8	7.4GY 2.3/4.0
<u>Flower Characteristics</u>		
Petal Width	11.8 mm	12.7 mm
Petal Length	12.5 mm	12.5 mm
Petal Length/Width Ratio	1.06	0.98
Flower Diameter	31.8 mm	32.0 mm
Calyx Diameter	33.2 mm	31.3 mm
<u>Fruit Characteristics</u>		
Fruit Width	38.70 mm	37.10 mm
Fruit Length	35.40 mm	38.00 mm
Fruit Length/Width Ratio	0.91	1.02
Average Berry Size	22.0 g	23.9 g
Fruit Skin Color	6.6R 2.9/9.7	8.3R 3.5/13.0
Fruit Flesh Color	7.0R 4.3/	9.2R 5.2/
	16.4 & white	16.7 & white
Total Yield (g/plant)	1546	1579
Late Yield (g/plant)	525	496

*Yield after 8/15/98

TABLE 2

CHARACTERISTICS OF 'ALISAL', 'COMMANDER', 'LIDO', and 'KEY LARGO'				
	Alisal	Commander	Lido	Key Largo
<u>Plant</u>				
Habit	flat globose	flat globose to flat	upright to globose	globose
Density	medium to dense	open	open	open
Vigor	strong	medium	weak	weak

TABLE 2-continued

CHARACTERISTICS OF 'ALISAL', 'COMMANDER', 'LIDO', and 'KEY LARGO'				
	Alisal	Commander	Lido	Key Largo
<u>Leaf</u>				
Color of upper side	light green 6.1 GY 3.2/5.8	light to medium green 8.9 GY 2.3/4.7	medium to dark green 5.6 GY 2.3/3.6	light green 6.1 GY 3.2/5.8
Color of under side	light gray-green	light gray-green	light gray-green	light gray-green
Shape in cross section	slightly concave to flat (mostly flat)	concave	concave	flat
Interveinal blistering	strong to very strong	medium to strong	medium	medium
Glossiness	weak to medium	medium to strong	weak to medium	medium
Number of leaflets	3	3	3	3
Terminal leaflet margin profile	revolute to flat	revolute to flat	flat	revolute to flat
Terminal leaflet length/width ratio	1.01	1.03	1.00	1.03
Terminal leaflet shape of base	acute to obtuse	obtuse	obtuse	acute to obtuse
Terminal leaflet shape of teeth	obtuse	obtuse to rounded	rounded	acute
Terminal leaflet average number of teeth	25.4	18.5	22.6	19.7
Petiole pubescence	very sparse to sparse	sparse	sparse to medium	sparse to medium
Petiole pose of hairs	outwards	outwards	upwards to outwards	upwards
Bracts frequency on petioles	80% (mostly double)	20% (mostly single)	50% (mostly single)	10% (mostly single)
<u>Stolon</u>				
Number	many	medium to many	few to medium	few to medium
Anthocyanin coloration	strong	weak to medium	medium	medium to strong
Thickness	medium	medium	thick	thin
Pubescence	medium to dense	sparse	medium to dense	sparse
<u>Inflorescence</u>				
Position relative to foliage	above	level to above	level to above	above
Flower size	medium to large	large	medium	small to medium
Diameter of calyx relative to corolla	larger to same size	same size to larger	same size	larger to much larger
Diameter of inner calyx relative to outer	smaller to same size	same size	larger	larger
Spacing of petals	overlapping	overlapping	overlapping	overlapping
Petal length/width ratio	longer than broad	broader than long to as	broader than long	as long as broad

TABLE 2-continued

CHARACTERISTICS OF 'ALISAL', 'COMMANDER', 'LIDO', and 'KEY LARGO'				
	Alisal	Commander	Lido	Key Largo
<u>Fruiting Truss</u>				
Attitude at first picking	semi-erect	prostrate	erect to semi-erect	semi-erect to prostrate long
Length	medium to long	medium	short to medium	long as broad
<u>Fruit</u>				
Length/Width Ratio	broader than long to as long as broad	as long as broad	as long as broad	as long as broad to longer than broad
Weight	22.0 g	23.9 g	24.2 g	20.3 g
Predominant shape	conical to cordate	conical to bi-conical	cordate	conical
Difference in shapes between primary and secondary fruits	moderate to marked	slight	moderate to marked	slight
Band without achenes	very narrow to narrow	narrow to medium	absent or very narrow	absent or very narrow
Unevenness of surface	weak	weak	medium	very weak to weak
Skin color	red to dark red 6.6R 2.9/9.7	orange red 8.3R 3.5/13.0	red 6.6R 3.2/12.6	red 5.5R 2.9/11.6
Evenness of color	even	slightly uneven	even	even
Glossiness	strong	strong	strong	weak to medium
Insertion of achenes	below the surface	level with the surface	below to level with the surface	below to level with the surface
Insertion of calyx	in a basin	level	in a basin	level
Pose of the calyx segments	spreading to reflex	spreading	spreading to reflex	spreading to reflex
Size of calyx in relation to fruit	same size	same size	smaller	same size to larger
Firmness of flesh	soft to medium	medium	medium to firm	medium to firm
Color of flesh	white to pale rose and white 7.0R 4.3/16.4	light red to orange red 9.2R 5.2/16.7	pale rose & white 7.8 R/ 5.2/16.5	orange red 6.8R 3.7/15.8
Evenness of flesh color	uneven	slightly uneven	slightly uneven	slightly uneven
Distribution of flesh color	only marginal	marginal and central	marginal and central	marginal and central
Hollow center size	small	medium	absent	small to medium
Sweetness	medium to strong	medium to strong	strong	medium
Texture when tasted	fine to medium	fine to medium	fine	medium
Acidity	weak	weak to medium	weak	medium

5.3 Resistance to Stress

The new variety is moderately resistant to high soil pH and moderately susceptible to high soil salt levels.

5.4 Insect and Disease Resistance and Susceptibility

The 'Alisal' variety is moderately susceptible to *Xanthomonas fragariae* and Botrytis fruit rot. The variety is moderately resistant to Powdery Mildew. 'Alisal' is susceptible to Verticillium wilt. The 'Alisal' variety is also susceptible to injury by the two-spotted spider mite (*Tetranychus urticae*) and lygus bug (*Lygus hesperus*).

5.5 ISOZYME ANALYSIS

In addition to the morphological description above, the new cultivar 'Alisal' 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 strawberry varieties. Specifically, leaf samples of 'Alisal', 'Commander', 'Lido' and 'Key Largo' were analyzed by electrophoresis for isozyme patterns of the enzymes phosphoglucosomerase (PGI), leucine aminopeptidase (LAP) and phosphoglucomu-

tase (PGM). See *J. Amer. Soc. Hort. Sci.* 106:684-687. Isozyme characterization of the three varieties is presented in Table 3, with the letters representing the banding patterns for each enzyme as designated in the above-identified article.

TABLE 3

ISOZYME PHENOTYPES FOR 'ALISAL', 'COMMANDER', 'LIDO' AND 'KEY LARGO'				
Locus	Alisal	Commander	Lido	Key Largo
PGI	A4	A4	A3	A1
LAP	B3	B3	B3	B3
PGM	C4	C4	C2	C4

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What is claimed is:

1. A new and distinct variety of strawberry plant, substantially as shown and described.

* * * * *



FIG.1

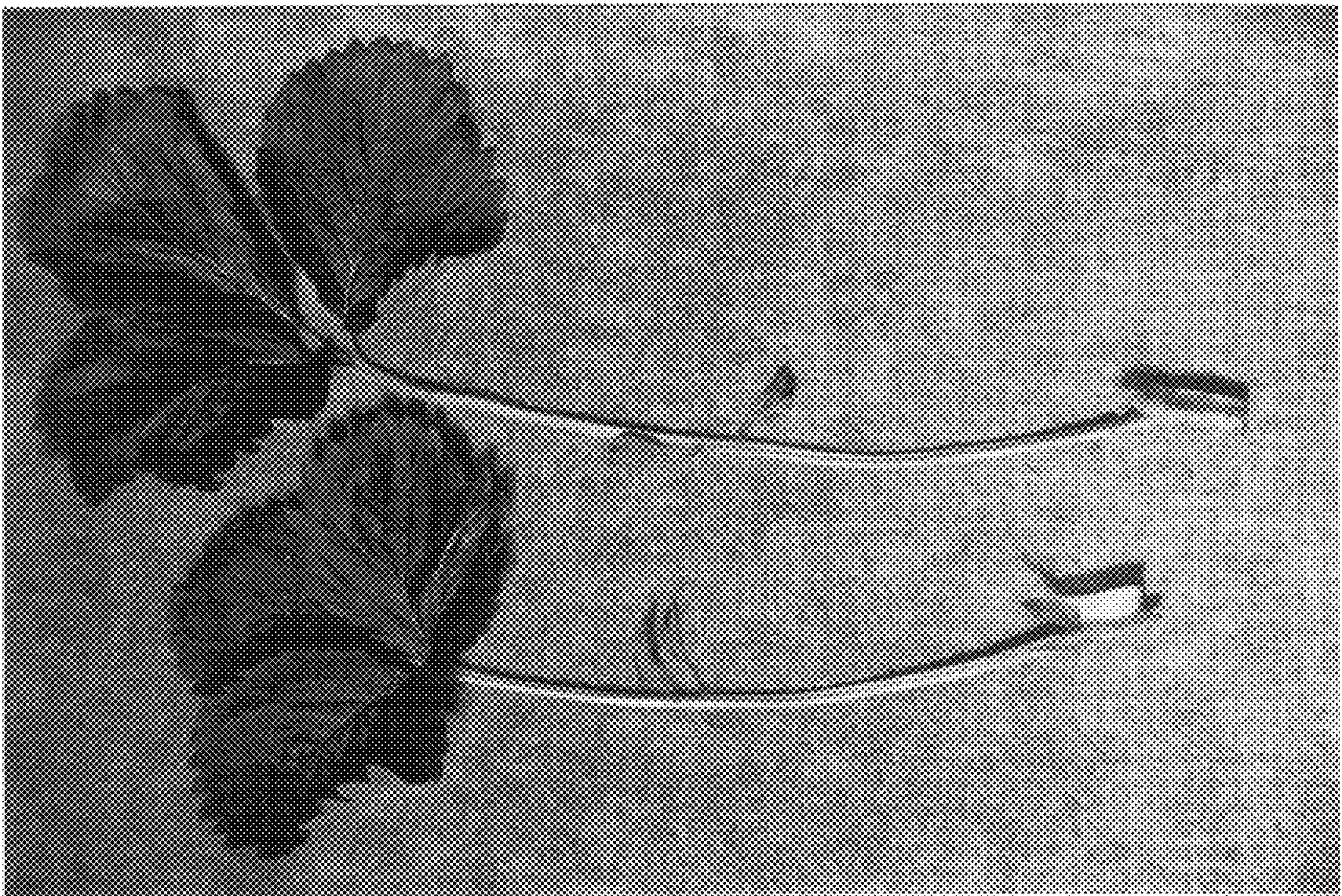


FIG.2

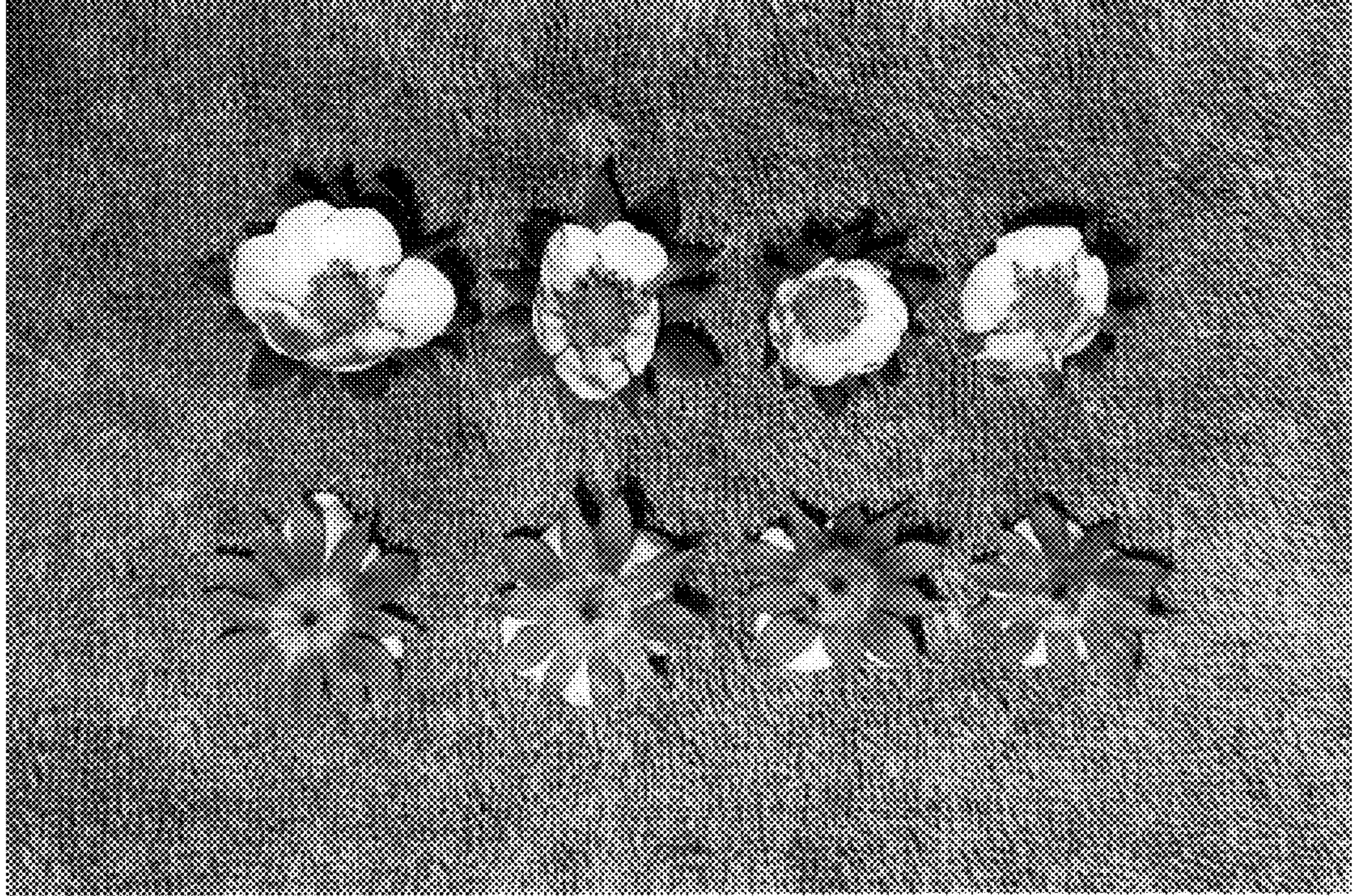


FIG.3

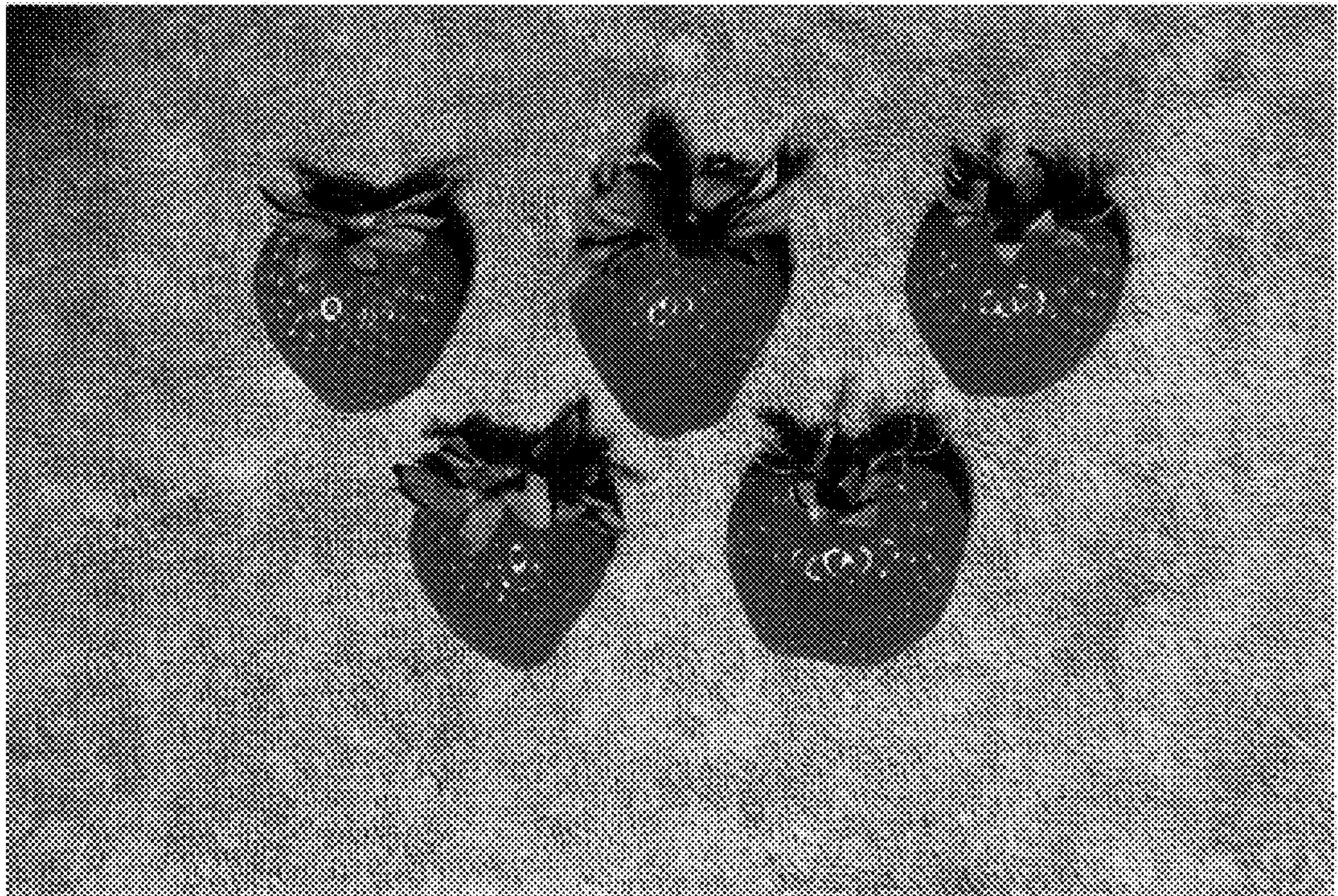


FIG.4

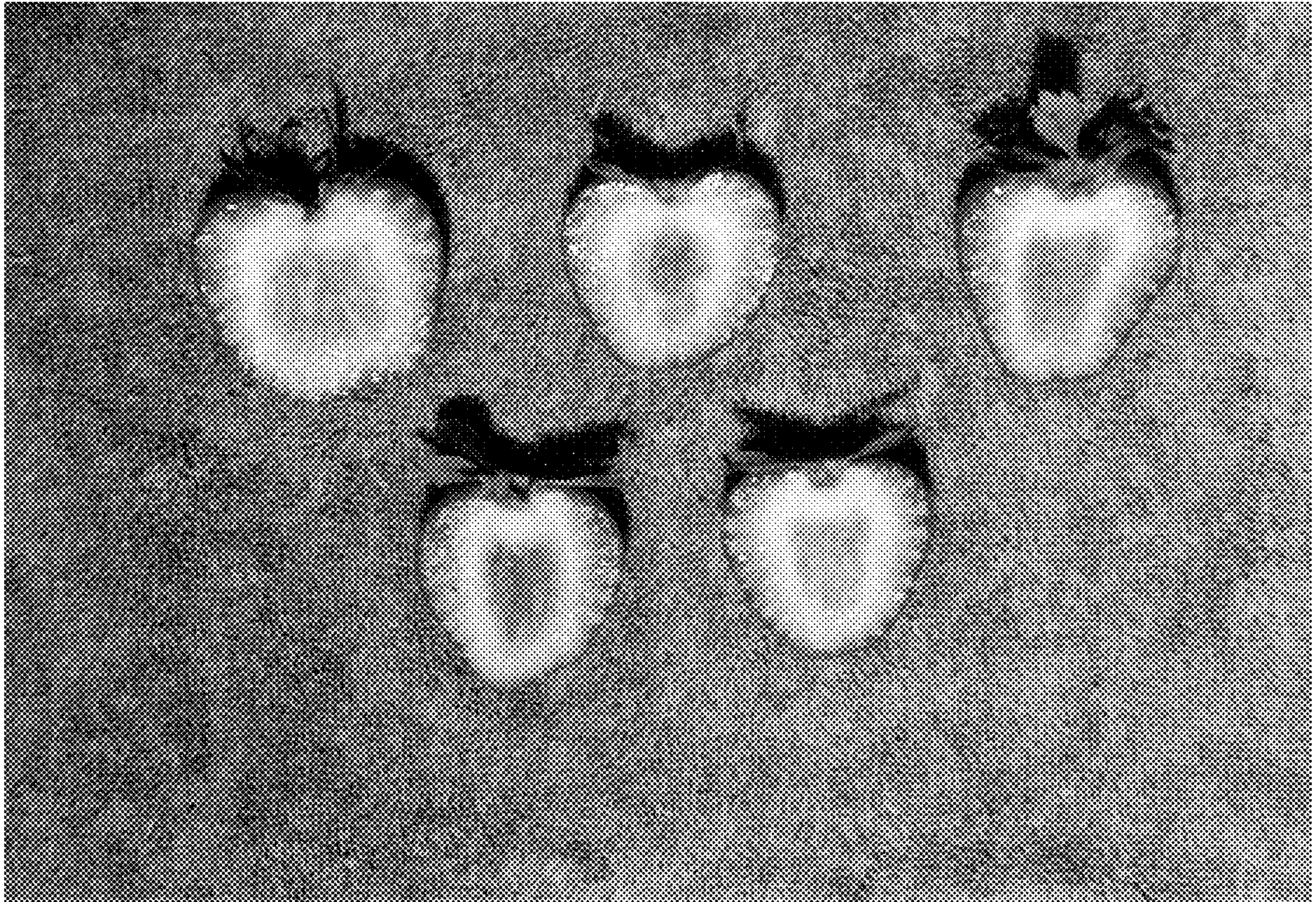


FIG.5