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(12) **United States Plant Patent**  
**Trigiano et al.**

(10) **Patent No.:** **US PP32,468 P3**  
(45) **Date of Patent:** **Nov. 17, 2020**

- (54) **CORNUS FLORIDA TREE NAMED ‘ERICA’S APPALACHIAN SUNRISE’**
- (50) Latin Name: *Cornus florida* L.  
Varietal Denomination: **Erica’3 s Appalachian Sunrise**
- (71) Applicant: **UNIVERSITY OF TENNESSEE RESEARCH FOUNDATION,**  
Knoxville, TN (US)
- (72) Inventors: **Robert N. Trigiano,** Knoxville, TN (US); **Phillip A. Wadl,** Charleston, SC (US)
- (73) Assignee: **UNIVERSITY OF TENNESSEE RESEARCH FOUNDATION,**  
Knoxville, TN (US)
- (\*) 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.: **16/602,052**
- (22) Filed: **Jul. 26, 2019**
- (65) **Prior Publication Data**  
US 2020/0323117 P1 Oct. 8, 2020

**Related U.S. Application Data**

- (60) Provisional application No. 62/830,694, filed on Apr. 8, 2019.

- (51) **Int. Cl.**  
*A01H 5/00* (2018.01)  
*A01H 6/00* (2018.01)
- (52) **U.S. Cl.**  
USPC ..... **Plt./220**  
CPC ..... *A01H 6/00* (2018.05)
- (58) **Field of Classification Search**  
USPC ..... Plt./220  
CPC ..... *A01H 5/02; A01H 5/00*  
See application file for complete search history.

(56) **References Cited**

PUBLICATIONS

Wadl, P.A. et al. “Molecular Identification Keys for Cultivars and Lines of *Cornus florida* and *C. kousa* Based on Simple Sequence Repeat Loci” *Journal of the American Society for Horticultural Science*, 2008, pp. 783-793, vol. 133, No. 6.

*Primary Examiner* — Kent L Bell

(74) *Attorney, Agent, or Firm* — Saliwanchik, Lloyd & Eisenschenk

(57) **ABSTRACT**

A new and distinct cultivar of flowering dogwood tree, which produces both fully dark red bracts and lighter red to pink bracts is provided. This dogwood tree is botanically known as *Cornus florida* and referred to by the following cultivar name: ‘Erica’s Appalachian Sunrise’.

**3 Drawing Sheets**

**Specification includes a Sequence Listing.**

This invention was made with Government support under Contract No. NACA-58-6062-6 awarded by the U.S. Department of Agriculture. The Government has certain rights in the invention.

The Sequence Listing for this application is labeled “Seq-List.txt” which was created on Oct. 29, 2019 and is 4 KB. The entire content of the sequence listing is incorporated herein by reference in its entirety.

**BACKGROUND OF THE INVENTION**

The present invention relates to a new and distinct cultivar of flowering dogwood tree with a mixture of both fully dark red and lighter red bracts. This new cultivar was the result of a controlled cross that produced a few seeds, which were planted in a greenhouse in Knoxville, Tenn. This new cultivar was discovered among the resulting seedlings. This dogwood tree is botanically known as *Cornus florida* L. and is hereinafter referred to by the following cultivar name: ‘Erica’s Appalachian Sunrise’. Analysis has shown that this new dogwood cultivar is the result of self-pollination of the dogwood cultivar ‘Cherokee Brave’ (U.S. Plant Pat. No. 10,166). The seedling of ‘Erica’s Appalachian Sunrise’ was harvested on its own rootstock. Results have shown that the

unique features of this new dogwood cultivar are stable and reproduced true-to-type in successive vegetative generations.

**BRIEF DESCRIPTION OF THE DRAWINGS**

FIG. 1. Photograph of one type of bracts and flowers of the dogwood cultivar ‘Erica’s Appalachian Sunrise’. This bract has fully dark red coloration and is less than about 5% of the bracts produced by the cultivar. Colors in the photograph may differ from actual colors due to lighting and light reflectance.

FIG. 2. Photograph of ‘Erica’s Appalachian Sunrise’ dogwood cultivar showing the other type of bract and flowers produced more than about 95% of the time on the dogwood tree, which has lighter red or more pink bracts. Colors in the photograph may differ from actual colors due to lighting and light reflectance.

FIG. 3. Photograph of new leaf growth on ‘Erica’s Appalachian Sunrise’. Colors in the photograph may differ from actual colors due to lighting and light reflectance.

FIG. 4. Photographs of the bracts and flowers of dogwood cultivars ‘Cherokee Brave’ and ‘Karen’s Appalachian Blush’, (U.S. Plant Pat. No. 13,165), which were initially crossed. Results show that the resulting F1 cultivar, ‘Erica’s

Appalachian Sunrise', is not, as was expected, related to 'Karen's Appalachian Blush', but is the result of self-pollination of 'Cherokee Brave' (U.S. Plant Pat. No. 10,166). It can be seen that the lighter red or pink bracts of 'Erica's Appalachian Sunrise' (shown in FIG. 2) closely resemble the bracts of the parent, 'Cherokee Brave'.

FIG. 5. Photograph of the less commonly produced bracts and flowers, less than about 5%, of the dogwood cultivar 'Erica's Appalachian Sunrise' (top—fully dark, red bracts), and those of 'Karen's Appalachian Blush' (bottom left) and 'Cherokee Brave' (bottom right).

#### DETAILED DESCRIPTION OF THE NEW VARIETY

A new and distinct cultivar of flowering dogwood tree producing both fully dark red bracts and lighter red or pink bracts. Both types of bracts are significantly smaller than the bracts of the parent cultivar, 'Cherokee Brave'. This dogwood tree cultivar is botanically known as *Cornus florida* and referred to by the following cultivar name: 'Erica's Appalachian Sunrise'. This cultivar appears to be highly resistant to powdery mildew caused by *Erysiphe pulchra*.

This new and distinct dogwood tree cultivar is a product of self-pollination of the dogwood cultivar 'Cherokee Brave'. The subject dogwood tree cultivar differs from 'Cherokee Brave' in that the instant cultivar produces significantly smaller and both fully dark red bracts and lighter red bracts and also exhibits greater resistance to powdery mildew.

#### DETAILED BOTANICAL DESCRIPTION

The following observations, measurements and comparisons describe this cultivar grown in Maryville, Tenn. Trees used for this description were about ten (10) years old. Both the fully dark red bracts and lighter red to pink bracts are substantially the same size, though significantly smaller than the bracts produced by the parent cultivar. Plant hardiness is expected to be zones 4-9. The color characteristic descriptions use color references to The Royal Horticultural Society (R.H.S.) Colour Chart, The Royal Horticultural Society, London, UK, 4<sup>th</sup> Edition, 2001, except where general terms of ordinary dictionary significance are used.

A bee-mediated pollination between the dogwood cultivars 'Cherokee Brave' and 'Karen's Appalachian Blush' was conducted in April of 2009. Seeds were collected from both cultivars and planted in a greenhouse in Knoxville, Tenn. This new and distinct dogwood tree cultivar was discovered among the planting and germination of the seeds harvested from 'Cherokee Brave'. The following Table 1 shows the alleles at nine (9) loci compared between the cultivars 'Karen's Appalachian Blush' (U.S. Plant Pat. No. 13,165), 'Cherokee Brave', and the new cultivar 'Erica's Appalachian Sunrise'. As seen in Table 1, the alleles for 'Erica's Appalachian Sunrise' are identical at all nine (9) loci to those of 'Cherokee Brave' and have no alleles that match 'Karen's Appalachian Blush'. This demonstrates conclusively that dogwood cultivar 'Erica's Appalachian Sunrise' was the result of self-pollination of 'Cherokee Brave'. Asexual reproduction of 'Erica's Appalachian Sunrise' by grafting of axillary buds onto seedling rootstocks has shown that the unique features of this new dogwood cultivar are stable and reproduced true-to-type in successive vegetatively propagated generations.

TABLE 1

Allelic Comparisons at Nine (9) loci for dogwood cultivars 'Karen's Appalachian Blush' (KAB), 'Cherokee Brave' (CB), and 'Erica's Appalachian Sunrise' (EAS)					
Cultivar	Loci/Primer				
	CF213	CF191	CF273	CF322	CT585
KAB (as base-pair size)	270:270	132:169	140:144	137:173	167:187
CB (as base-pair size)	267:278	144:144	133:142	154:154	174:174
EAS (F1) (as base-pair size)	267:278	144:144	133:142	154:154	174:174

Cultivar	Loci/Primer			
	CF597	CF634	CF713	CF562
KAB (as base-pair size)	114:126	120:126	154:154	208:208
CB (as base-pair size)	105:120	113:113	144:144	212:225
EAS (F1) (as base-pair size)	105:120	113:113	144:144	212:225

TABLE 2

Simple Sequence Repeats and Associated Primers for Nine Loci shared by the Dogwood Cultivars 'Erica's Appalachian Sunrise' and 'Cherokee Brave'			
GenBank accession no.	Locus	Forward and Reverse Primer Sequences (5'-3')	Repeated Seq.
ED651856	CF191	F: AACCTGCATCTTCCCCAAGT (SEQ ID NO: 1) R: CCTTTTACCAACCAACACG (SEQ ID NO: 2)	(AG) <sub>20</sub> T(GA) <sub>12</sub> (GAA) <sub>4</sub>
ED651874	CF213	F: TGCAAATGGTTATTGATTGCTCTC (SEQ ID NO: 3) R: ATTTGTTTCCCATGACCTGAAAGA (SEQ ID NO: 4)	(CT) <sub>9</sub> (GT) <sub>12</sub>
ED651920	CF273	F: TCATATTTATGCTTTCCTTGCCGT (SEQ ID NO: 5) R: GTGATCCTCTCCTAAGGACTTCCA (SEQ ID NO: 6)	(AC) <sub>14</sub>
ED651957	CF322	F: CTAACCTGCATCTTCCCCAAG (SEQ ID NO: 7) R: TTTACCAACCAACACGACAC (SEQ ID NO: 8)	(AG) <sub>20</sub> TG(AG) <sub>12</sub>
ER870584	CF562	F: CCAGAGGTATGAATTCTGTGT (SEQ ID NO: 9) R: CTTGCAAATTGTTGTAATGAA (SEQ ID NO: 10)	(GT) <sub>16</sub>
ER870607	CF585	F: AACGAAGCAAGCAAAACAATC (SEQ ID NO: 11) R: ACCCCACCACTTCATCTCTC (SEQ ID NO: 12)	(AT) <sub>7</sub> (GT) <sub>11</sub>
ER870619	CF597	F: AAGTCAGATCATTTTCAGATTAACA (SEQ ID NO: 13) R: CGAATTGACGATAAATACAAAATA (SEQ ID NO: 14)	(AC) <sub>13</sub>
ER870656	CF634	F: GAAATTCAAATTTTAAAGAAGTCC (SEQ ID NO: 15) R: TTGTATAGTACTTCAAGGCCACT (SEQ ID NO: 16)	(AG) <sub>14</sub>
ER870735	CF713	F: GATACTTATGCAATTAGGACACAA (SEQ ID NO: 17) R: GTAACAATGGTGAAGGAAG (SEQ ID NO: 18)	(TC) <sub>18</sub>

The cultivar 'Erica's Appalachian Sunrise' has some phenotypic similarities to the cultivar 'Cherokee Brave', but also distinct differences. The following Table 3 provides a comparison of those characteristics for each cultivar that have been observed. Measurements are provided as averages (with ranges also provided as indicated):

TABLE 3

Comparison of Characteristics for Three Dogwood Tree Cultivars			
Character	'Erica's Appalachian Sunrise'	'Cherokee Brave'	
1 Tree Height (observation)	2 meters (at 8 years)	2-3 meters (10-15 years)	15
2 Tree Form	Branching/Spreading	Branching/Spreading	
3 Growth Rate	Slow 16 cm/year	Moderate 24 cm/year	
4 Spread of Tree	1.5 meters	2.0 meters	
5 Trunk Diam. at 1 meter	6.5 cm	8 cm	20
6 Trunk Texture	Smooth	Smooth	
7 Primary Trunk Color/New Branches/Texture	144A New Growth Older Mature 201B/196B Smooth	144A New Growth Older Mature 201B/196B Smooth	25
8 Presence of anthocyanin (observation) Coloration by anthocyanin on the immature leaf upper side	Red with Green Mainly 61B with some 143C	Red with Green Mainly 61B with some 143C	30
9 Color of mature leaf upper surface/lower surface	Green 143C and some 61B More red than 'Cherokee Brave' and red is persistent through growing season/Green 143C	Green Group 136C, with very little red (mostly Green 136C for the growing season)	35
10 Color of leaves in autumn (observation)	Red-Purple 71A	Red-Purple 71A	40
11 Leaf shape	Ovate	Ovate	
12 Leaf Margin	Entire	Entire	45
13 Leaf Tip	Cuspidate	Cuspidate	
14 Leaf Base	Cuneate	Cuneate	
15 Leaf Venation/Texture	Palmate/Smooth with hairs	Palmate/Smooth with hairs	
16 Leaf Length	4.1-6.25 cm	5.0-7.2 cm	
17 Leaf Width	0.8-1.2 cm	1.0-2.0 cm	50
18 Petiole Length	<1 cm	<1 cm	
19 Petiole Color	134C	134C	
20 Petiole Texture	Smooth	Smooth	
21 Flower diameter (measurement)	6.5 mm open	6.5 mm open	55
22 Floret color when open (observation)	Yellow Green 150A-150B with some purple 76A to 76B on top	Yellow Green 150A-150B with some purple 76A to 76B on top	
23 Uniformity of bract size (observation)	See 24-29	See 24-29	60
24 Bract overlapping (observation for both types)	Overlapping tips and edges	Slightly overlap	

TABLE 3-continued

Comparison of Characteristics for Three Dogwood Tree Cultivars			
25 Whole shape of bracts (observation)	Spade-shaped with point at the base	Tear-drop with blunt tip	5
26 Inner Bract length (measurement)	23.1 mm (both types)	38.8 mm	
27 Inner Bract width (measurement) - modified cleft	16.8 mm (both types)	35.9 mm	10
28 Outer Bract width (measure)	18.9 mm (both types)	38.5 mm	15
29 Outer Bract length (measurement)	15.3 mm (both types)	30.3 mm	
30 Number of bracts	4	4	
31 Bract color (light red)	63C - striated red-veined, on white (95%)	63C - striated red-veined, on white, pure white base of bract	20
32 Bract color (dark red)	182A to 181B (mostly solid color with some white striation near the base (<5%))	63C striated red-veined, on white, pure white base of bract	25
33 Cleft in Bract	Yellow Green 145C (<5%)	Some are almost pure white, others have same color as the bracts	30
34 Bract duration (both types)	Most bracts gone by mid-late April	Most bracts gone by mid-late April	
35 Pedicel Length	23.8 mm	25.2 mm	
36 Bract variegation (observation)	None	None	
37 Pistil color (observation)	Yellow Green 150A-150B	Yellow Green 150A-150B	
38 Fruit shape (observation)	Broadly oval	Broadly oval	
39 Fruit length (measurement)	About 1.5 cm	About 1.5 cm	40
40 Fruit color (observation)	Red when mature in fall 45A to 45B	Red when mature in fall 45A to 45B	
41 Fragrance (observation)	None	None	45
42 Flowering season (observation)	Spring	Spring	
43 Flowering time (observation)	April	April	
44 Deciduous or evergreen (observation)	Deciduous	Deciduous	
45 Disease resistance (observation)	Highly resistant to powdery mildew caused by <i>Erysiphe pulchra</i> but some Spot Anthracnose spotting by <i>Elsinoe cornii</i> 144A (mottled)	Moderately resistance to powdery mildew caused by <i>Erysiphe pulchra</i> but some Spot Anthracnose by <i>Elsinoe cornii</i> 144A (mottled)	55
46 Bark color (mature)	19.7	25.0	60
47 Flower/inflorescence number	19.7	25.0	
48 Anther color	Purple 86A	Purple 86A	
49 Flower petal length	3-5 mm	3-5 mm	65

TABLE 3-continued

Comparison of Characteristics for Three Dogwood Tree Cultivars			
50	Flower petal color (closed)	Purple 76A to 76B on top and Yellow Green 150A-150B near bottom	Yellow Green group 149B (no purple)
51	Flower petal color (open)	150A to 150B	150A to 150B
	Character		'Karen's Appalachian Blush'
1	Tree Height (observation)	2-3 meters (10-15 years)	
2	Tree Form	Narrow few branches	
3	Growth Rate	Slow 12 cm/year	
4	Spread of Tree	0.8 meters	
5	Trunk Diam. at 1 meter	5 cm	
6	Trunk Texture	Smooth	
7	Primary Trunk Color/New Branches/Texture	144C New Growth Older Mature 202A/196B Smooth	
8	Presence of anthocyanin (observation) Coloration by anthocyanin on the immature leaf upper side	Green 143B	
9	Color of mature leaf upper surface/lower surface	144C to 144B Both surfaces	
10	Color of leaves in autumn (observation)	71C to 71D	
11	Leaf shape	Ovate	
12	Leaf Margin	Entire	
13	Leaf Tip	Cuspidate	
14	Leaf Base	Cuneate	
15	Leaf Venation/Texture	Palmate/Smooth with hairs	
16	Leaf Length	5.0-8.0 cm	
17	Leaf Width	2.0-2.5 cm	
18	Petiole Length	1.0-1.3 cm	
19	Petiole Color	149A	
20	Petiole Texture	Smooth	
21	Flower diameter (measurement)	6.5 mm open	
22	Floret color when open (observation)	Yellow Green 150A-150B with some purple 76A to 76B on top	
23	Uniformity of bract size (observation)	See 24-29	
24	Bract overlapping (observation for both types)	Very little overlap	
25	Whole shape of bracts (observation)	Linear	
26	Inner Bract length (measurement)	29.3 mm	
27	Inner Bract width (measurement) - modified cleft	20.4 mm	
28	Outer Bract width (measure)	23.8 mm	
29	Outer Bract length (measurement)	31.8 mm	
30	Number of bracts	4	
31	Bract color (light red)	White 155B	
32	Bract color (dark red)	Some pink 49D around margins	

TABLE 3-continued

Comparison of Characteristics for Three Dogwood Tree Cultivars		
33	Cleft in Bract	bleeding towards center Reduced and Violet purple 93B to Blush purple group N74C or creamy white with purple/red 84D
34	Bract duration (both types)	Most bract gone by mid-late April
35	Pedicel Length	19.5 mm
36	Bract variegation (observation)	None
37	Pistil color (observation)	Yellow Green 150A-150B
38	Fruit shape (observation)	Broadly oval
39	Fruit length (measurement)	About 1.5 cm
40	Fruit color (observation)	Red when mature in fall 45A to 45B
41	Fragrance (observation)	None
42	Flowering season (observation)	Spring
43	Flowering time (observation)	April
44	Deciduous or evergreen (observation)	Deciduous
45	Disease resistance (observation)	Highly resistant to powdery mildew caused by <i>Erisphe pulchra</i> but some Spot Anthracnose <i>Elsinoe cornii</i>
46	Bark color (mature)	144C
47	Flower/inflorescence number	16.4
48	Anther color	Purple 86A
49	Flower petal length	3-5 mm
50	Flower petal color (closed)	Purple 76A to 76B on top and Yellow Green 150A-150B near bottom
51	Flower petal color (open)	150C

Botanical classification: *Cornus florida* 'Erica's Appalachian Sunrise'.

Unique features: A mixture of two types of bracts, a first one being less than about 5% of the bracts produced that is fully dark red and a second type being more than about 95% of the bracts produced that is similar in color to the bracts produced by the parent 'Cherokee Brave'. Both types of bracts on 'Erica's Appalachian Sunset' are similar in size and significantly smaller than the bracts produced by the parent 'Cherokee Brave'. Fewer flowers per inflorescence of 'Erica's Appalachian Sunset' than on 'Cherokee Brave'.

Disease susceptibility: 'Erica's Appalachian Sunrise' has a strong resistance to Powdery mildew caused by *Erisphe pulchra* and only some spotting caused by *Elsinoe corni*, a cosmetic disease with little damage.

Insect damage: None noted.

## SEQUENCE LISTING

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We claim:

55

1. A new and distinct cultivar of Dogwood tree, *Cornus florida*, named 'ERICA'S APPALACHIAN SUNRISE', as illustrated and described.

\* \* \* \* \*



FIG. 1



FIG. 2



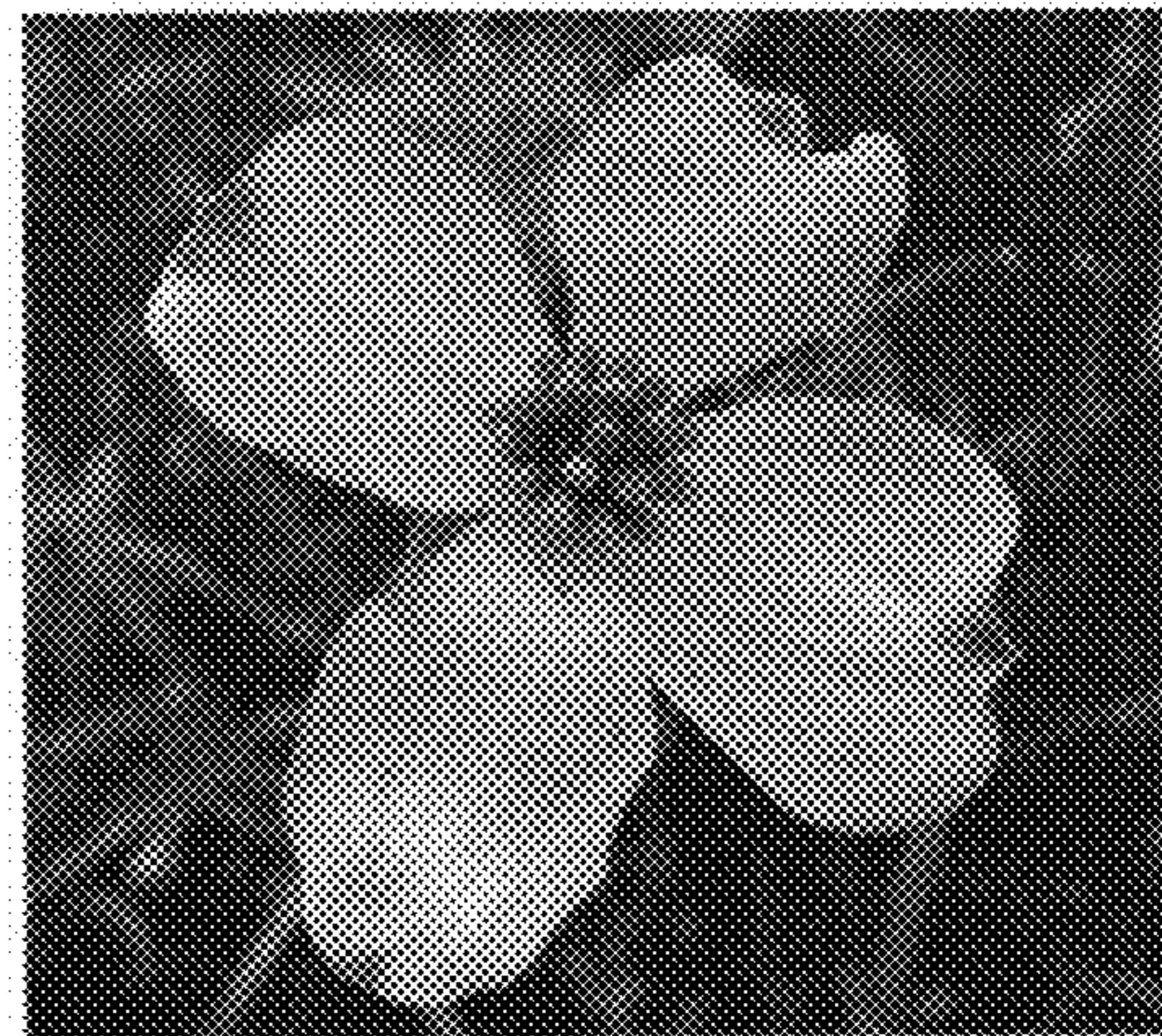


FIG. 3



'Cherokee Brave'

X



'Appalachian Blush'

FIG. 4

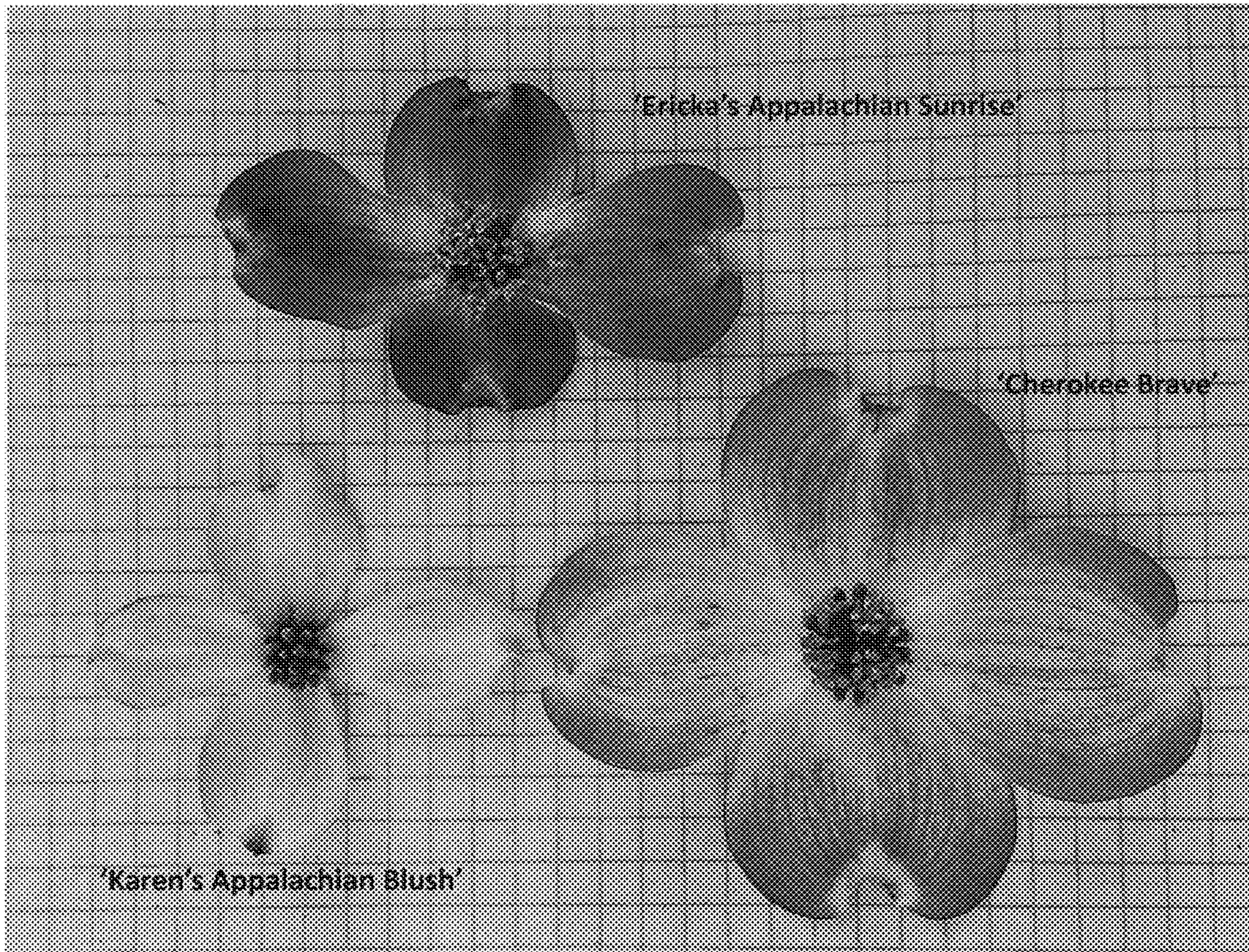


FIG. 5

UNITED STATES PATENT AND TRADEMARK OFFICE  
**CERTIFICATE OF CORRECTION**

PATENT NO. : PP32,468 P3  
APPLICATION NO. : 16/602052  
DATED : November 17, 2020  
INVENTOR(S) : Robert N. Trigiano and Phillip A. Wadl

Page 1 of 1

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the Specification

Column 4,

Line 7, "CT585" should read --CF585--.

Signed and Sealed this  
Third Day of August, 2021



Drew Hirshfeld  
*Performing the Functions and Duties of the  
Under Secretary of Commerce for Intellectual Property and  
Director of the United States Patent and Trademark Office*