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

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(54) **GRASS NAMED 'TIFT PA5'**

(50) Latin Name: ***Pennisetum alopecuroides***
Varietal Denomination: **Tift PA5**

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(65) **Prior Publication Data**

US 2019/0281753 P1 Sep. 12, 2019

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A01H 5/12 (2018.01)
A01H 6/46 (2018.01)

(52) **U.S. Cl.**
USPC **Plt./384**
CPC ***A01H 6/4654*** (2018.05)

(58) **Field of Classification Search**
USPC Plt./384
CPC A01H 5/12; A01H 5/02
See application file for complete search history.

(56) **References Cited**

PUBLICATIONS

http://magazine.gardencentermag.com/article/january-2018/emerald-coast-growers-january-2018.aspx; Jan. 2018; 4 pages.*

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(57) **ABSTRACT**

A new variety of *Pennisetum alopecuroides* plant named 'Tift PA5' produces a reduced number of seeds, making it less invasive.

2 Drawing Sheets

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Latin name of the genus and species of the plant claimed: 'Tift PA5' is a vegetatively propagated ornamental perennial *Pennisetum* cultivar of the genus and species *Pennisetum alopecuroides*.

Variety denomination: The new *Pennisetum alopecuroides* claimed is of the cultivar denominated 'Tift PA5'.

BACKGROUND OF THE INVENTION

The present invention relates to a new and distinct cultivar of *Pennisetum alopecuroides* herein referred to as 'Tift PA5'.

The new *Pennisetum alopecuroides* is a product of a planned research, evaluation, and testing program conducted by the Inventors in Tifton, Ga. The objective of the *Pennisetum alopecuroides* research program is to create a new plant cultivar with reduced seed production. This cultivar is commercially important for its superior ornamental value and low seed production. These and other qualities are enumerated herein.

Pedigree and history: We evaluated four morphologically variable unpatented accessions in the Tifton, Ga. collection for ornamental potential: 'Tift PS989', 'Tift PS990', 'Tift PS1122', and 'Tift PS1123'. 'Tift PS989' and 'Tift PS1122' were selected as accessions with the most ornamental potential. *Pennisetum alopecuroides* accessions and cultivars are known to produce abundant seed. Seed production in commercial ornamental cultivars of *Pennisetum alopecuroides* tends to make this genus/species invasive, an undesirable trait in landscapes. Open pollinated seeds from 'Tift PS989' plants were irradiated on 11 Nov. 2010 with 10 Kr and 20 Kr of Cobalt 60 gamma radiation to produce a first group of

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irradiated seeds. These seeds were planted in a field on Mar. 29, 2011 to produce 256 and 135 plants, respectively, from each treatment. In 2011, plants grown from the 10 Kr treated seeds from the first group of seeds were evaluated and six of these evaluated plants were selected based on morphologically desirable genotypes with reduced seed set. Open pollinated seeds (a second group of seeds) from these six selected plants was harvested and irradiated with 10 Kr of Cobalt 60 on 10 Jan. 2012. Irradiated seeds from only one of the six selected plants survived the second radiation and were planted in a field in 2012 to produce 64 plants. Irradiation of seeds usually results in chimeras or sectors on the plants for the trait of interest. Therefore, each of the sixty four plant was divided into four quadrants or sectors (a, b, c, and d) and five or more inflorescences from each quadrant were examined for seed sterility. A highly seed sterile sector a of plant number 60 was selected and asexually propagated to produce 'Tift PA5'. 'Tift PA5' has been tested at Tifton, Ga. in 2012, 2014, and 2015 and at Blairsville, Ga. from 2012 thru 2015. Tests consisted of five and four single plant asexually propagated replications arranged in a randomized complete block experiment at Tifton, Ga. and Blairsville, Ga., respectively. Seven other experimental entries were included in each test.

'Tift PA24' was selected as a seed fertile check with desirable ornamental characteristics from 'Tift PS1122'. 'Tift PA24' also produced abundant pollen for pollinating the experimental seed sterile cultivars in the replicated tests to verify whether the experimental sterile cultivars would set seed when pollinated with pollen from another genotype.

Asexual reproduction of the new *Pennisetum* 'Tift PA5' by vegetative propagation (single stem propagules) in a

controlled environment in Tifton, Ga. and/or Blairsville, Ga. from 2012 through 2015, has shown that the unique features of this new *Pennisetum* cultivar are stable and reproduced true to type in successive generations.

SUMMARY OF THE INVENTION

The following traits have been repeatedly observed and represent the characteristics of a new *P. alopecuroides* cultivar 'Tift PA5'. The new cultivar 'Tift PA5' has not been observed under all possible environmental conditions. The phenotype may vary somewhat with variations in, for example, temperature, day-length, light intensity, soil types, and water and fertility levels without, however, any variance in genotype.

Throughout this specification, color names beginning with a small letter signify that the name of that color, as used in common speech, is aptly descriptive. Color names beginning with a capital letter designate values based upon The R.H.S. Colour Chart (5th Edition, 2007), published by The Royal Horticultural Society, London, England.

The following traits have been repeatedly observed for the new *P. alopecuroides* cultivar 'Tift PA5' in Tifton, Ga. and Blairsville, Ga. and can be compared to *P. alopecuroides*, 'Tift PA24' (a seed and pollen fertile genotype with desirable ornamental characteristics):

1. 'Tift PA5' exhibits a vigorous growth habit.
2. 'Tift PA5' is highly seed sterile.
3. Inflorescence numbers for 'Tift PA5' are variable.

The new cultivar *Pennisetum* 'Tift PA5' can be compared to *Pennisetum alopecuroides*, 'Tift PA24', a seed and pollen fertile and desirable ornamental selection:

Plants of the new *Pennisetum* 'Tift PA5' are compared to 'Tift PA24' in the following characteristics:

1. The new cultivar 'Tift PA5' produces significantly fewer seeds at Tifton, Ga. and Blairsville, Ga. compared to 'Tift PA24'.
2. The new cultivar 'Tift PA5' produces inflorescences heights significantly shorter than 'Tift PA24'.
3. The new cultivar 'Tift PA5' produces a leaf canopy diameter significantly narrower than that of 'Tift PA24'.
4. The new cultivar 'Tift PA5' produces significantly shorter leaf heights than 'Tift PA24'.
5. Leaf length of the new cultivar 'Tift PA5' is generally shorter than the leaf length of 'Tift PA24'. The leaf width of the new cultivar 'Tift PA5' is equal to or narrower than the leaf width of 'Tift PA24'.

The following observations, measurements, and values describe plants grown in Tifton, Ga. and Blairsville, Ga. In Tables 1-7, the least significant difference (LSD) is set at P≤0.05 probability level. Growth days were included in the ratings. Plants were spaced 1 meter apart down the row and rows were 2 meters apart. Plants were established as single stem propagules in mid-April to mid-May and rated in September through October. Data was taken from plants during year of establishment at Tifton, Ga. and Blairsville, Ga. except 2015 data from Blairsville was taken on plants established in 2014.

'Tift PA5' tended to be significantly shorter for height of inflorescences (Table 1) and leaves (Table 2), and narrower for canopy diameter (Table 3) than 'Tift PA24'. The canopy diameter, especially with arching leaves contributes to the beauty of 'Tift PA5', especially before inflorescences are produced. Inflorescence number adds greatly to the beauty of this species. Inflorescence numbers for 'Tift PA5', were significant, sometimes being greater in number than 'Tift 24' and sometimes fewer in number (Table 4). However, inflorescence length for 'Tift PA5' tended to be shorter than those of 'Tift PA24' (Table 5). Leaf lengths of 'Tift PA5' were shorter than those of 'Tift PA24' and leaf widths of 'Tift PA5' were either equal to or less than 'Tift PA24' (Table 6).

Adaxial leaf color of mature leaves of 'Tift PA5' plants is Green-141B, whereas inflorescence color were Greyed Orange-165B, for 'Tift PA5'.

Seed set in 'Tift PA5' is significantly reduced. (Table 7).

TABLE 1

Height of inflorescence of two *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Height of Inflorescence (cm)						
	Tifton			Blairsville			
Entry	2012	2014	2015	2012	2013	2014	2015
'Tift PA5'	37	45	52	59	84	67	89
'Tift PA24'	62	51	83	107	126	106	106
LSD	6	9	8	9	12	14	9
Growth Days	180	99	101	178	116	130	155

Plant heights were measured from ground level to top of inflorescence. The Tifton tests were planted 18 Apr. 2012, 2 Jun. 2014, and 12 May 2015 and measurements were taken 15 Oct. 2012, 9 Sep. 2014, and 21 Aug. 2015, respectively. The Blairsville tests were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements were taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference at the P≤0.05 probability level.

TABLE 2

Height of leaves of two ornamental *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Height of Leaves (cm)							
	Tifton				Blairsville			
Entry	2012	2013	2014	2015	2012	2013	2014	2015
'Tift PA5'	55	32	33	30	41	54	32	51
'Tift PA24'	86	41	34	54	60	73	50	83
LSD	9	8	7	5	5	9	10	5
Growth Days	180	170	99	101	148	116	130	155

The height of leaves were measured from ground level to top of leaf canopy.

The tests at Tifton were planted 18 Apr. 2012, 13 Apr. 2013, 2 Jun. 2014, and 12 May 2015 and measurements taken 5 Oct. 2012, 30 Sep. 2013, 9 Sep. 2014, and 21 Aug. 2015, respectively. The Blairsville tests were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements were taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference at the P≤0.05 probability level.

TABLE 3

Canopy diameter of two ornamental *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Canopy Diameter (cm)			
	Tifton		Blairsville	
Entry	2012	2015	2014	2015
'Tift PA5'	48	62	61	103
'Tift PA24'	81	98	123	136
LSD	10	9	25	7
Growth Days	180	101	130	155

The canopy diameter is the average diameter of the widest and the narrowest diameter of a single plant canopy. The tests at Tifton were planted 18 Apr. 2012 and 12 May 2015 and measurements taken 8 Oct. 2012, and 21 Aug. 2015, respectively. The tests at Blairsville were planted 15 May 2014 and measurements taken 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants). The least significant difference was set at the P≤0.05 probability level.

TABLE 4

Number of inflorescences per plant of two ornamental *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Number of Inflorescences			
	Tifton		Blairsville	
Entry	2014	2015	2014	2015
'Tift PA5'	58	67	54	100
'Tift PA24'	135	62	75	67
LSD	42	16	43	19
Growth Days	99	101	130	155

Total number of inflorescences were counted per plant. The tests at Tifton were planted 18 Apr. 2012, 13 Apr. 2013, 2 Jun. 2014, and 12 May 2015 and measurements were taken on 15 Oct. 2012, 30 Sep. 2013, 9 Sep. 2014, and 21 Aug. 2015, respectively. The tests at Blairsville were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements were taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference was set at the P≤0.05 probability level.

TABLE 5

Inflorescence length of two ornamental *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Inflorescence Length (cm)					
	Tifton		Blairsville			
Entry	2012	2015	2012	2013	2014	2015
'Tift PA5'	10	7.3	9	11	8	12
'Tift PA24'	13	11.1	13	15	13	15
LSD	1	0.8	1	1	2	1.4
Growth Days	180	101	178	116	130	155

Inflorescence length was the mean of three inflorescences per plant. The tests at Tifton were planted 18 Apr. 2012 and 12 May 2015 and measurements taken 15 Oct. 2012 and 21 Aug. 2015, respectively. The tests at Blairsville were planted 14 Apr. 2012, 16 May 2013, and 15 May 2014, and measurements taken 9 Sep. 2012, 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference at the P≤0.05 probability level.

TABLE 6

Leaf characteristics of individual plants of two ornamental *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Leaf Length (cm)			Leaf Width (mm)		
	Tifton		Blairsville	Tifton		Blairsville
Entry	2012	2015	2015	2012	2015	2015
'Tift PA5'	24.7	23.4	28.8	5.0	4.7	9.6
'Tift PA24'	26.8	33.6	40.2	6.5	7.4	9.6
LSD	5.1	3.3	10.9	1.4	0.7	1.1

Leaf length (average from three culms) was measured from the leaf collar to the leaf tip of the latest fully extended leaf. Leaf width (average of three culms) was measured in the center of the latest fully extended leaf. The tests at Tifton were planted 18 Apr. 2012 and 12 May 2015 and measurements taken 15 Oct. 2012, and 21 Aug. 2015, respectively. The tests at Blairsville were planted 15 May 2014 and measurements taken 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant difference was set at the P≤0.05 probability level.

TABLE 7

Seed set per inflorescence and seed germination of six ornamental *Pennisetum alopecuroides* grasses ('Tift PA24' is the seed and pollen fertile control) planted at two locations in Georgia.

	Seeds per Inflorescence					Seed Germination - %
	Tifton		Blairsville			Blairsville
Entry	2013	2015	2013	2014	2015	2014
'Tift PA5'	0.0	0.0	0.0	0.0	0.0	0
'Tift PA24'	15.4	91.5	121	102	71.2	93
LSD	0.3	0.0	26	29.4	1.3	21

Seeds per inflorescence was the mean of four random inflorescences per each replication.

Seed germination tests consisted of 25 seeds from four and three different plants (replications) harvested in October 2014 at Tifton and Blairsville, respectively. Germination tests were conducted in April of 2015 to allow seeds to go through a dormancy period and simulate field conditions. The Tifton tests were planted 13 Apr. 2013 and 12 May 2015 and measurements taken in October 2013 and 2015. The Blairsville tests were planted 16 May 2013, and 15 May 2014, and measurements taken 9 Sep. 2013, 22 Sep. 2014 and 24 Sep. 2015 (data taken on 2014 plants), respectively. The least significant differences were set at the P≤0.05 probability level.

TABLE 8

Summary of morphological characteristics of two *Pennisetum alopecuroides* cultivars.

Trait	'Tift PA24'	'Tift PA5'
Mature inflorescence height	51-126 cm	37-89 cm
Mature leaf height	34-86 cm	30-55 cm
Diameter of plant canopy	81-135 cm	48-103 cm
Inflorescence length	11.1-15 cm	8-12 cm
Number of Inflorescences per plant	62-135	54-100
Leaf width	7.4-9.6 mm	4.7-9.6 mm
Leaf length	26.8-40.2 cm	23.4-28.8 cm
Adaxial leaf surface trichomes	Glabrous	Glabrous
Abaxial leaf surface trichomes	Glabrous	Glabrous
Leaf blade margin trichome length	Less than 0.5 mm long	Medium, Less than 1 mm long
Leaf collar trichomes	Dense, 2 mm long	Medium density, Less than 1 mm long
Sheath trichomes	Margins sparse, 1 mm long	Margins sparse, 1 mm long
Ligule	Yes.	Yes
Ligule trichomes	Sparse, less than 1 mm long	Sparse, less than 1 mm long
Sheath trichomes	Sparse, 1 mm long	Sparse, 1 mm long
Floret length	5-6 mm	5-6 mm
Bristle length surrounding florets	6-19 mm	5-22 mm

BRIEF DESCRIPTION OF THE FIGURES

The accompanying colored photographs illustrate the overall appearance and distinct characteristics of the new cultivar of *Pennisetum* 'Tift PA5'. The colors in the photographs are as close as possible with the photographic and printing technology utilized.

Certain characteristics of this variety, such as growth and color, may change with changing environmental conditions (e.g., light, temperature, moisture, nutrient availability, or other factors). Color descriptions and other terminology are used in accordance with their ordinary dictionary descriptions, unless the context clearly indicates otherwise. Color designations are made with reference to The Royal Horticultural Society (R.H.S.) Colour Chart (5^{th} edition, 2007).

FIG. **1** is a photograph of a 'Tift PA5' plant growing in a research plot (year of establishment) in Union County, Ga.

FIG. **2** is a photograph of 'Tift PA5' plants growing in a research plot (year of establishment) at Tifton, Ga.

DETAILED DESCRIPTION

The new cultivar 'Tift PA5' is a vigorous perennial at Blairsville, Ga. (USDA Zone 7a). The new cultivar 'Tift PA5' survived 90, 95, and 101 days below 0° C. and low temperatures of −9, −29, and −17° C. for the winters of 2012/2013, 2013/2014, and 2014/2015, respectively at Blairsville, Ga.

All data are from plants established as single stem propagules in mid-April to mid-May and rated in September through October, except the 2015 data from Blairsville, Ga. was collected from plants established in 2014.

Plant:

Mature inflorescence height.—8-12 cm.

Mature leaf height.—30-55 cm.

Diameter of plant canopy.—48-103 cm.

Inflorescence length.—8-12 cm.

Number of inflorescences per plant.—54-100.

Number of culms per plant.—Typically about the same as the number of inflorescences per plant (Table 4) because most of the major culms produce an inflorescence.

Leaf:

Leaf width.—4.7-9.6 mm.

Leaf length.—23.4-28.8 cm.

Adaxial leaf surface trichomes.—Glabrous.

Abaxial leaf surface trichomes.—Glabrous.

Leaf blade margin trichome length.—Medium, less than 1 mm long.

Leaf collar trichomes.—Medium, less than 1 mm long.

Sheath trichomes.—Margin sparse, 1 mm long.

Ligule.—Yes.

Ligule trichomes.—Sparse, less than 1 mm long.

Sheath trichomes.—Sparse, 1 mm long.

Adaxial leaf color.—Green 141B.

Abaxial leaf color.—Green 139D.

Inflorescence color.—Greyed Orange 165B.

Although rust (*Puccinia substriata*), leaf spot (*Pyricularia grisea*), and *Helminthosporium* sp. leaf spot are common diseases for *Pennisetum* in Tifton, Ga. due to its humid and warm climate; to date, 'Tift PA5' has not presented any disease symptoms.

No pest susceptibility has been observed for 'Tift PA5'.

Hardiness: 'Tift PA5' has vigorously survived 64, 97 and 96 days below 0° C. and lowest temperatures of −12° C., −18° C. and −17° C., in 2012, 2014, and 2/015, respectively in Blairsville, Ga.

What is claimed is:

1. A new and distinct cultivar of *Pennisetum alopecuroides* plant named 'Tilt PA5', as illustrated and described herein.

* * * * *

FIG. 1

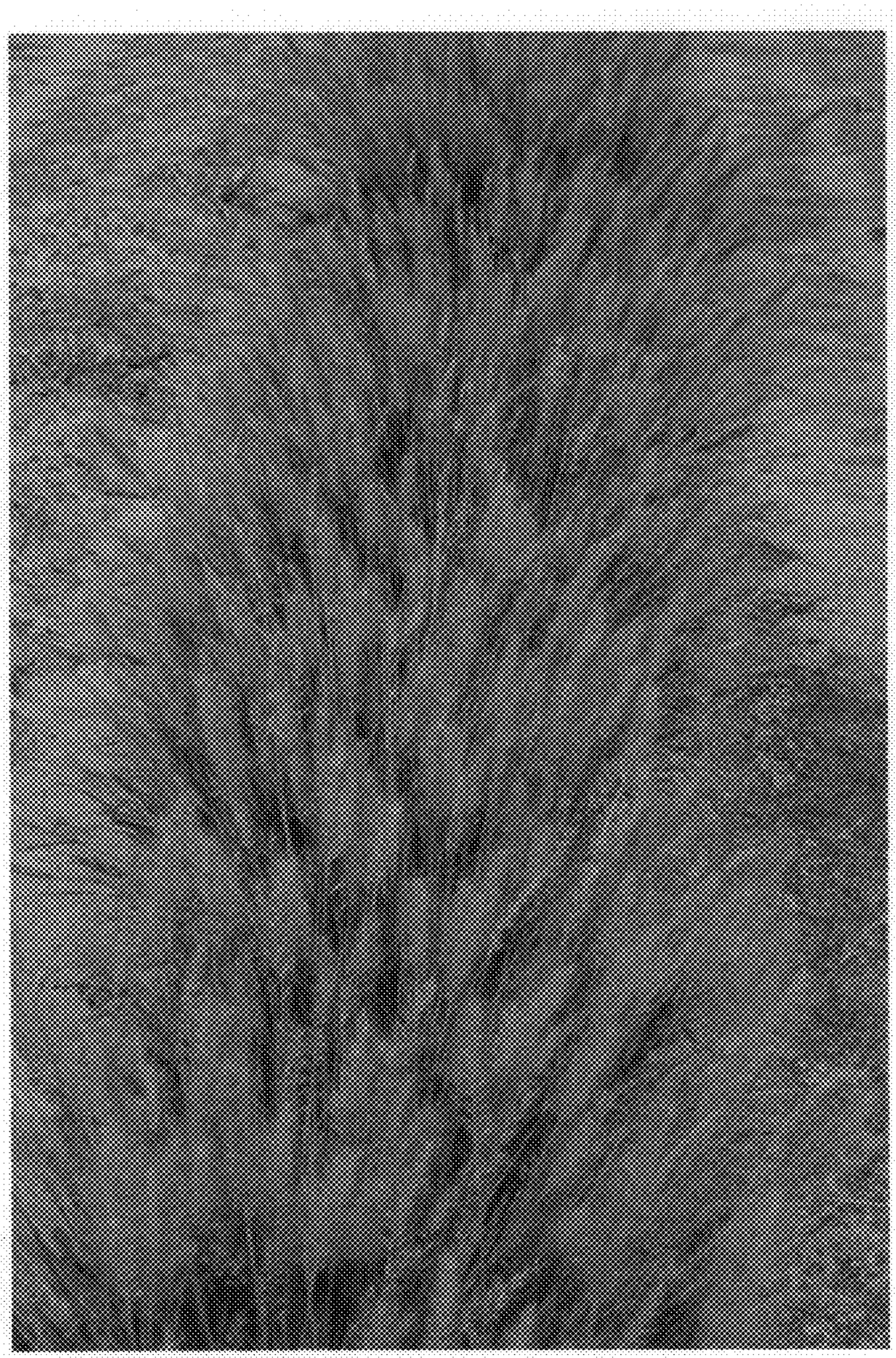

FIG. 2

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : PP31,027 P3
APPLICATION NO. : 15/932494
DATED : November 5, 2019
INVENTOR(S) : Wayne W. Hanna et al.

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

On the Title Page

Item (54) In the Title:
"GRASS NAMED 'TIFT PA5'" should read --ORNAMENTAL GRASS NAMED 'TIFT PA5'--.

Signed and Sealed this
Seventh Day of April, 2020

Andrei Iancu
Director of the United States Patent and Trademark Office