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Warren

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(54) **JAPANESE ZELKOVA TREE NAMED ‘JFS KW4ZS’**

(50) Latin Name: *Zelkova serrata*
Varietal Denomination: **JFS KW4ZS**

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(57) **ABSTRACT**

A variety of *Zelkova serrata* with a combination of an
upright branching vase shaped semi compact tree form with
dark green foliage and orange to orange red fall color.

9 Drawing Sheets

1

Latin name of the genus and species of the plant claimed:
Zelkova serrata.

Variety denomination: ‘JFS KW4ZS’.

BACKGROUND OF THE INVENTION

In 2001, I began a program to create improved cultivars
of Japanese *Zelkova*, *Zelkova serrata*. I searched through
thousands of seedlings of *Zelkova serrata* growing in nurs-
ery rows in Canby, Oreg., Independence, Oreg., and Boring,
Oreg. I walked along each row, looking for significant
seedling variation that might hint at a unique and improved
cultivar. From this search, I selected 50 seedling trees. The
present tree was selected as an open pollinated seedling
among seedlings of *Zelkova serrata* seedlings in Boring,
Oreg. I marked and labeled this new tree, ‘JFS KW4ZS’, to
be transplanted for further evaluation. It first caught my
attention because it was more upright growing, with a
sturdier trunk, better branching, dark green foliage, and a
somewhat shorter internode length than typical seedlings of
the species.

I dug this new tree during winter dormancy and trans-
planted it, along with the 49 other *Zelkova serrata* seedlings
that were selected in this process, in a special evaluation row
in the Boring, Oreg. nursery. During the summers of 2002
and 2003, I continued to evaluate this tree in comparison to
the other special seedlings I had selected as well as typical
Zelkova serrata seedlings. I became convinced that this tree
had unique and improved characteristics that would be
valuable as a cultivar in the nursery and landscape trade. In
February of 2004, I transplanted ‘JFS KW4ZS’ and four
other seedlings from this group of 50 into a special long term
block where the spacing would allow it to grow to a larger
and fuller form. The remaining 45 seedling trees were
destroyed. Of the five trees planted in the long term block,
one is ‘JFS KW4ZS’, one is ‘JFS-KW1’ U.S. Plant Pat. No.
20,996, and the other three were rejected and destroyed.
Over the next several years, I continued to examine and

2

evaluate my new tree in comparison to both seedlings and
existing commercial cultivars of the species.

In August, 2011, I began a program to test asexual
propagation of ‘JFS KW4ZS’ in small field plots in nursery
rows in Canby, Oreg., by chip budding on *Zelkova serrata*
seedling rootstock. I grew ‘JFS KW4ZS’ alongside existing
cultivars of *Zelkova serrata* for comparison, namely ‘JFS-
KW1’ (U.S. Plant Pat. No. 20,996), ‘Green Vase’ (U.S. Plant
Pat. No. 5,080) and ‘Musashino’ (unpatented). I continued to
direct that ‘JFS KW4ZS’ be chip budded in these small test
plots in the Canby, Oreg. nursery, each year through 2017.
A total of 93 test trees were produced in these plots. All of
the test propagated nursery trees were destroyed after evalu-
ation, except for 20 which I kept for stock increase. Evalu-
ation of these asexually propagated trees demonstrates the
valuable and unique characteristics of ‘JFS KW4ZS’ were
firmly fixed in each successive generation.

BRIEF SUMMARY OF THE INVENTION

This new cultivar possesses a unique combination of
characteristics that have proven firmly fixed in asexually
propagated progeny and that comprise a combination of
green foliage, and a more compact growth habit with a
symmetrical upright branch structure.

BRIEF DESCRIPTION OF THE DRAWINGS

The colors of an illustration of this type may vary with
lighting conditions and, therefore, color characteristics of
this new variety should be determined with reference to the
observations described herein, rather than from these illus-
trations alone.

FIG. 1: Shows the branch structure of the tree at 10 years
of age just before bud break.

FIG. 2: Shows new foliage and staminate flowers on a
display board.

FIG. 3: Shows new foliage, staminate and pistillate flow-
ers on a display board with scale.

FIG. 4: Shows a close up of staminate flowers on a display board with scale.

FIG. 5: Shows a close up of pistillate flowers on shoot tips with scale.

FIG. 6: Shows summer foliage on 2 year old trees. 5

FIG. 7: Shows summer foliage & branch angles on 2 year old trees.

FIG. 8: Shows a nursery production row of 2 year old trees.

FIG. 9: Shows a nursery production row of 3 year old trees. 10

DETAILED BOTANICAL DESCRIPTION

The following detailed description of the 'JFS KW4ZS' variety is based on observations of a 10 year old tree growing in Boring, Oreg. and of two and three year old asexually reproduced progeny. The observed progeny were trees which were growing in Boring, Oreg. & Canby, Oreg. Color descriptions are made with reference to The Royal Horticultural Society (London) Colour Chart © 1986, except where ordinary dictionary significance of color is indicated. Scientific name: *Zelkova serrata* 'JFS KW4ZS'. 15

Parentage:

Seed parent.—An unknown tree of the species *Zelkova serrata*. 25

Pollen parent.—Open pollinated by an unknown tree of the species *Zelkova serrata*.

Tree:

Overall shape.—Upright vase.

Height.—At 10 years of age, about 7.5 meters high. 30

Width.—At 10 years of age 5 meters spread.

Caliper (trunk diameter).—At 10 years of age, about 170 mm at 100 mm height, 145 mm at 1 m height.

Trunk.—Strong and straight.

Trunk bark texture.—Smooth.

Trunk bark color.—Greyed Green 197A.

Immature bark color.—Grey Brown 199B.

Mature bark color.—Greyed Green 197C.

Lenticels.—Absent in main trunk and older branches.

Branch color.—Greyed Brown 197C.

Branch lenticels.—Greyed Orange 167B, 1 mm long by 0.5 mm wide on younger branches. 40

Dormant buds.—Brown 200D, 1-2 mm long by 0.5 mm-1 mm wide: acute with overlapping scales.

Internodes.—Average internode length is about 35 mm-50 mm on one-year old shoots. 45

Hardiness.—Has tolerated temperatures to 10° F. in Canby, Oreg. which is the lowest temperature experienced at this location for this period. It is believed to have zone 5 cold hardiness similar to other plants of the same species.

Leaves: Except as otherwise noted, observations are from twenty vigorous growth leaves.

Arrangement.—Alternate.

Type.—Simple, entire.

Texture.—Smooth but directionally oriented pubescence can give the leaf a rough feel on the upper surface. 55

Sheen.—Glossy when leaves first emerge but then dull on upper surface matte on the lower surface.

Length.—Averaging 70 mm-110 mm.

Width.—Averaging 35 mm to 45 mm. 60

Petioles.—4 mm to 5 mm long, about 1 mm-2 mm in diameter, color Yellow-Green 151B.

Overall shape.—Long ovate.

Margin.—Serrate.

Tip.—Acuminate. 65

Base.—Subcordate.

Spring leaf color.—Yellow Green between 149A to 145A.

Summer leaf color.—Upper leaf surface: Green 137A. Lower leaf surface: Yellow Green 146B. Vein: Yellow Green 153A.

Fall leaf color.—Foliage turns to Greyed Orange between 168A to 172A.

Fall color begins.—October 25th (Boring, Oreg. 2021).

Fall color peak.—November 15st (Boring, Oreg. 2021).

Fall color ends.—November 30th (Boring, Oreg. 2021).

Pubescence.—Yes on the upper surface.

Persistence.—Tree is deciduous.

Venation pattern.—Pinnate.

Flowers:

Overall.—Monoecious, separate staminate & pistillate flowers emerge with the new leaves in the leaf axils on new shoots in the spring.

The flowers are inconspicuous and are of no ornamental value.

Size.—Staminate flowers are 4 mm-5 mm in diameter emerging in the leaf axils of the lower leaves. The pistillate flowers are solitary, sessile in the upper leaf axils and are 1 mm-1.5 mm in diameter.

Unopened bud.—Yellow-Green 144B-144C.

Stamens.—About 10 to 12 stamens, 2 mm to 4 mm.

Anthers.—Yellow Green 146A 0.25 mm in diameter.

Pistil.—Orange White 159D.

Pollen.—Yellow 11B.

Flowering date.—In Boring, Oreg. 2021 (an average bloom year). First blooms April 15th, peak bloom April 25th, last bloom May 5th.

35 Fruit: Observations are from a sampling of typical seeds.

Type.—Dried drupe, ovate, wingless.

Size.—Typical fruit is 3 mm to 4 mm in length by 2 mm to 3 mm wide.

Color.—Immature fruit is Green 143A.

Seeds.—Typically 1 per fruit, ovate 2 mm to 3 mm long by 1 mm to 2 mm wide.

Seed color.—Mature seed is Greyed Brown 199B.

Pest/disease resistance: 'JFS KW4ZS' exhibits no greater or lesser degree of pest or disease resistance or susceptibility when compared to other *Zelkova serrata* cultivars such as 'JFS-KW1' 'Green Vase', and 'Musashino'

COMPARISON TO THE SEED PARENT

50 Compared to a typical *Zelkova serrata* tree, 'JFS KW4ZS' develops into a more compact, smaller tree with a symmetrical, more upright branch structure.

TABLE 1

COMPARISON TO OTHER SIMILAR VARIETIES:			
	<i>Zelkova serrata</i> 'JFS KW4ZS'	<i>Zelkova serrata</i> 'JFS-KW1' U.S. Plant Pat. No. 20,996	<i>Zelkova serrata</i> 'Green Vase' U.S. Plant Pat. No. 5,080
Relative size at 10 years	Height 7.5 m Spread 5.0 m	Height 3.5 m Spread 2.7 m	Height 10 m Spread 6.5 m
Old Form	Compact upright vase	Compact oval to vase	Vase shaped, arching upright branches

TABLE 1-continued

COMPARISON TO OTHER SIMILAR VARIETIES:			
	<i>Zelkova serrata</i> ‘JFS KW4ZS’	<i>Zelkova serrata</i> ‘JFS-KW1’ U.S. Plant Pat. No. 20,996	<i>Zelkova serrata</i> ‘Green Vase’ U.S. Plant Pat. No. 5,080
Summer Upper Leaf Color	Green 137A	Green 139A	Green 136A
Summer Lower Leaf Color	Yellow-Green 146B	Yellow-Green 147A-147B	Yellow-Green 144A
Leaf Petiole length	4 mm to 5 mm	3 mm	4 mm to 6 mm
Typical Internode Length	35 mm to 50 mm	12 mm to 29 mm	45 mm-60 mm
Fall Color	Greyed-Orange between 168A to 172A	Yellow 11A to Yellow-orange 22A.	Greyed-Orange 170A

TABLE 1-continued

COMPARISON TO OTHER SIMILAR VARIETIES:			
	<i>Zelkova serrata</i> ‘JFS KW4ZS’	<i>Zelkova serrata</i> ‘JFS-KW1’ U.S. Plant Pat. No. 20,996	<i>Zelkova serrata</i> ‘Green Vase’ U.S. Plant Pat. No. 5,080
Branching	Upright, then moderately vase shaped, sturdy, symmetrical	Dense, stiff, more spreading, finely branched	Long, slender, lax and arching
Branch angles on the main stem on 2 YR old trees	30 to 35 degrees	45 to 50 degrees	35 to 40 degrees

I claim:
1. A new and distinct variety of *Zelkova* tree named ‘JFS KW4ZS’, substantially as illustrated and described herein.

* * * * *



FIG. 1



FIG. 2



FIG. 3

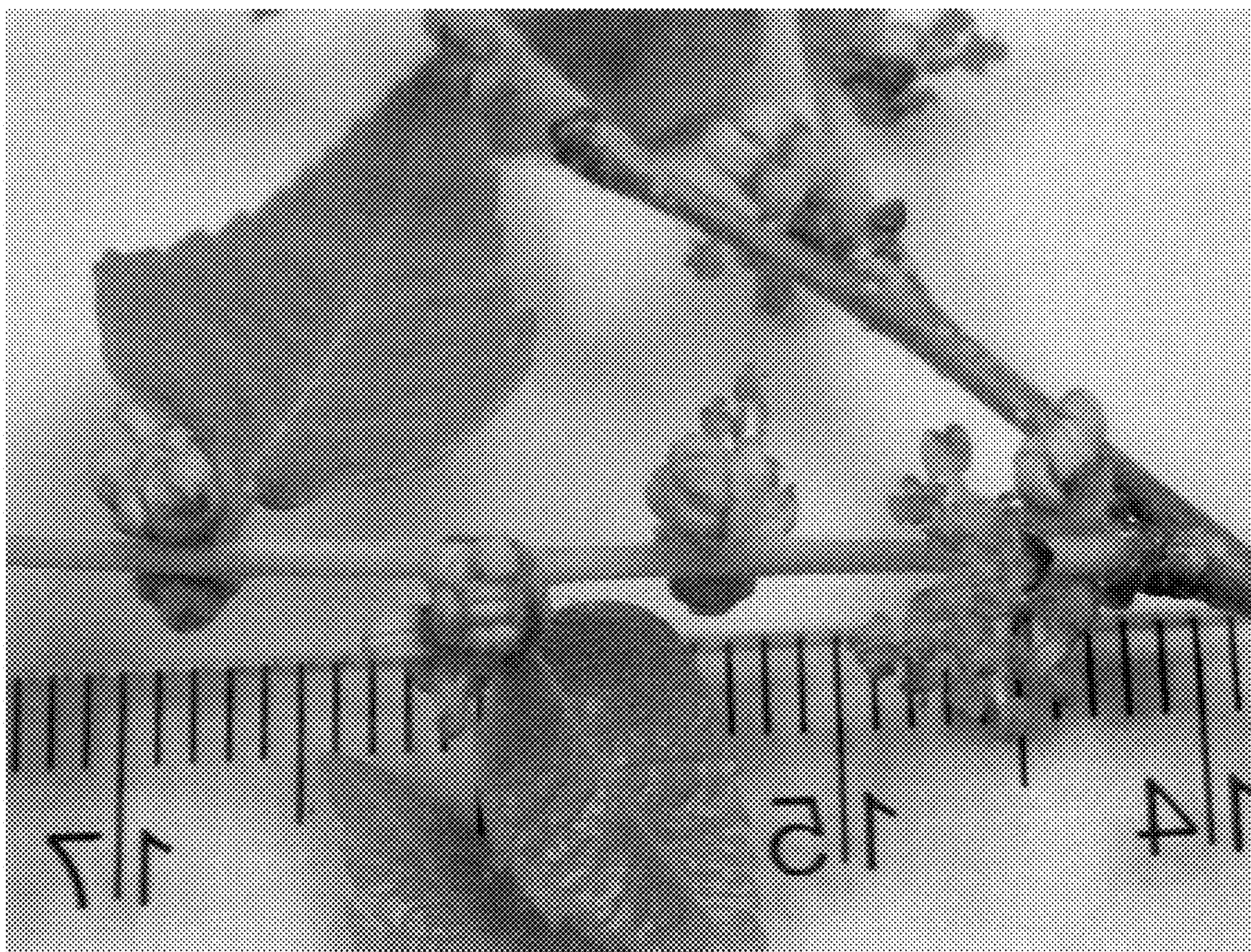


FIG. 4

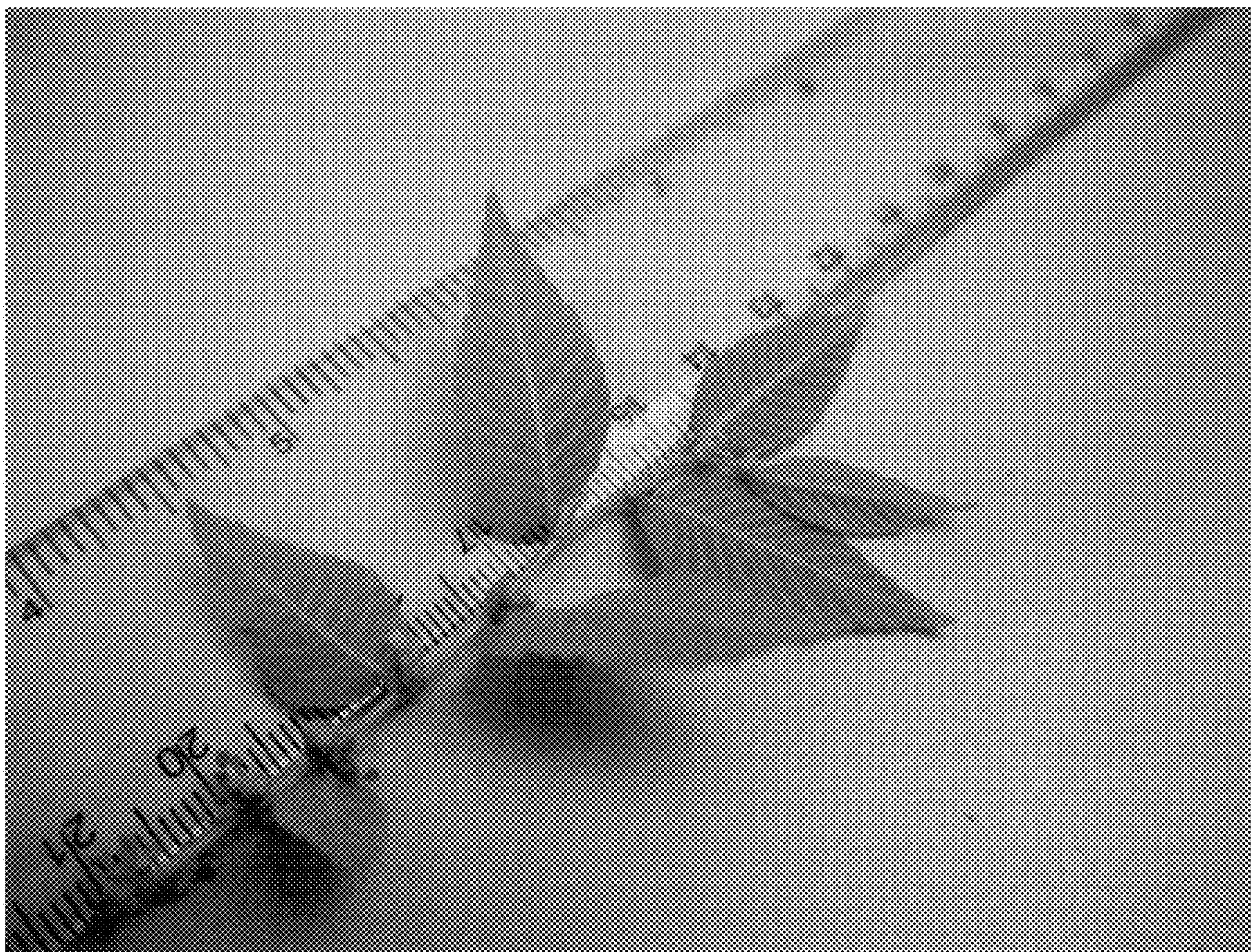


FIG. 5



FIG. 6



FIG. 7



FIG. 8

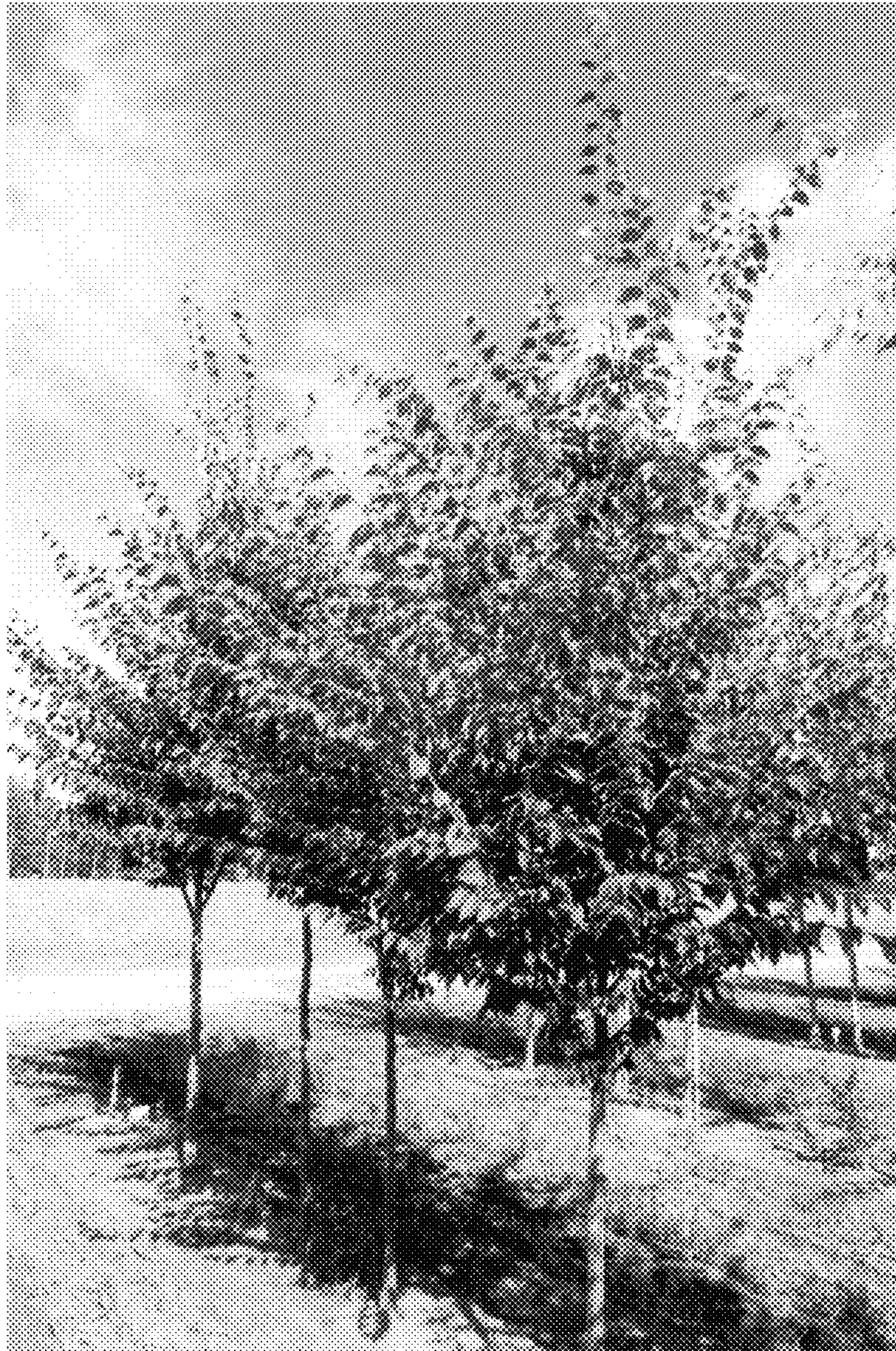


FIG. 9